PUBLIC

Document Version: 3.1 – 2022-06-15

SAP S/4HANA 2021

Feature Scope Description

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Document History

> ⚠ Caution
>
> Before you start the implementation, make sure you have the latest version of this document. You can find the latest version at the following location: https://help.sap.com/s4hana_op_2021

The following table provides an overview of the most important document changes.

Version	Date	Description
1.0	2021-10-13	Initial Version for SAP S/4HANA 2021
1.1	2021-11-05	Minor changes and move of Environment, Health and Safety in SAP S/4HANA Enhanced LoB Functions chapter from area Asset Management to area Manufacturing
1.2	2022-01-20	Minor corrections
1.3	2022-02-02	Minor corrections
2.0	2022-02-23	Version for SAP S/4HANA 2021 Feature Package Stack 01
2.1	2022-03-08	Minor corrections
3.0	2022-05-25	Version for SAP S/4HANA 2021 Feature Package Stack 02
3.1	2022-06-15	Chapters "Demand-Driven Replenishment" and "Predictive Material and Resource Planning" moved from area SAP S/4HANA Enhanced LoB Functions to area SAP S/4HANA Enterprise Management

1 SAP S/4HANA - Feature Scope Description

With SAP S/4HANA (SAP Business Suite 4 SAP HANA), SAP is providing a new product and a next generation of business applications – simple enterprise software for big data and designed to help you run simple in the digital economy.

The SAP S/4HANA family is fully built on the in-memory platform SAP HANA. Using the advanced potential of SAP HANA, SAP S/4HANA is designed for your digital business and provides an instant insight by using a single source of truth, real-time processes, dynamic planning and analysis. With SAP Fiori user experience and less complex data model it is designed to run simple, and in parallel reduces the data footprint of your company. SAP S/4HANA is also already connected to business networks and company-internal collaboration networks and prepared for the Internet of things. With all these aspects, SAP is protecting your investments by facilitating next generation business applications.

SAP S/4HANA is composed of:

- SAP S/4HANA Enterprise Management
  SAP S/4HANA Enterprise Management is designed for enterprises across industries that need a deep and broad level of functionality combined with a high degree of flexibility in customization.
- SAP S/4HANA Enhanced LoB Functions
  SAP S/4HANA Enhanced LoB Functions enhance core functions of SAP S/4HANA Enterprise Management to provide additional business benefit for your line of business (LoB). Please note that you might need a separate license.
- SAP S/4HANA Industry-Specific LoB Functions
  SAP S/4HANA Industry-Specific LoB Functions enhance core functions of SAP S/4HANA Enterprise Management to provide industry specific business benefit for your line of business (LoB). Please note that you might need a separate license.
- SAP S/4HANA Compatibility Packs
  Please note that the specific usage rights for SAP S/4HANA Compatibility Packs are set forth in the Software Use Rights Document.

Alternatively, this offering is available as

- SAP S/4HANA Cloud, extended edition. For further information on SAP S/4HANA Cloud, extended edition, please contact your SAP Account Executive.
- SAP S/4HANA Cloud, private edition. Please note, that the usage of some features mentioned in this document might be unavailable, restricted and/or might require a separate license in SAP S/4HANA Cloud, private edition. Features that are not available or are restricted in SAP S/4HANA Cloud, private edition are marked accordingly in this document. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

About this document

This feature scope description shows you which features are provided with SAP S/4HANA. In addition, this feature scope description also defines the product documentation for SAP S/4HANA.

Product documentation

The following product documentation is available for SAP S/4HANA:

- This feature scope description
- Information on installation
  You can find the relevant information on how to install SAP S/4HANA at https://help.sap.com/s4hana_op_2021.
- Information on conversion
  You can find the relevant information on how to convert from an existing SAP Business Suite product to SAP S/4HANA at https://help.sap.com/s4hana_op_2021
- Information on User-Interface (UI) technology
  You can find the relevant information on the User-Interface (UI) technology for SAP S/4HANA at https://help.sap.com/s4hana_op_2021
- Information on security
  You can find the relevant security information for SAP S/4HANA at https://help.sap.com/s4hana_op_2021
- Information on operation
  You can find the relevant information on how to operate SAP S/4HANA at https://help.sap.com/s4hana_op_2021

2 SAP S/4HANA Enterprise Management

SAP S/4HANA Enterprise Management is designed for enterprises across industries that need a deep and broad level of functionality combined with a high degree of flexibility in customization. The following features are provided as part of SAP S/4HANA Enterprise Management. Features that are not part of SAP S/4HANA Enterprise Management might require a separate license. For further information, please contact your SAP Account Executive.

2.1 Functions for Implementing SAP S/4HANA Solutions

Business Background

SAP S/4HANA offers you an assisted way to implement the features that you want to use in your SAP S/4HANA system.

Key Features

Key Feature	Use
Explore the solution scope	Users can display the selected business processes that are supported by the solution and display information about the functional scope of each business process.
Configure and activate the solution scope	Key users can activate a pre-configured solution and adjust the business configuration for this pre-configured solution by viewing and adjusting basic configuration settings using configuration activities. They can also add customer-specific business processes and activities.
Data Migration	Key users can start and execute data migration using pre-defined migration objects and can get overviews and statuses for their migration projects.

2.2 Data Protection

Business Background

Data protection is associated with numerous legal requirements and privacy concerns. In addition to compliance with general data protection acts, it is necessary to consider compliance with industry-specific

legislation in different countries/regions. SAP provides specific features and functions to support compliance with the relevant legal requirements and data protection, for example, functions are available for various applications that simplify the blocking and deletion of personal data by using SAP Information Lifecycle Management (ILM).

> **i** Note
>
> In the majority of cases, compliance with data protection laws is not a product feature.
>
> SAP software supports data protection by providing security features and specific data protection-relevant functions such as functions for the simplified blocking and deletion of personal data. SAP does not provide legal advice in any form. The definitions and other terms used in this document are not taken from any given legal source.
>
> The management of data in an extension scenario deviates from the management of data in the standard scenarios. You are responsible for ensuring that the data used in an extension scenario is managed in accordance with any applicable legal requirements or business needs, such as data protection legislation or data life cycle requirements. Please note that the extensibility framework is currently not integrated in the privacy-by-default functionality. Therefore, the extensibility framework should not be used for the processing of personal data if this processing falls under any applicable data protection legislation.

Key Features

The following table explains the key features available:

Key Feature	Use
Deletion and blocking: End of purpose check	Determines whether data is still relevant for business activities based on the residence period defined for the data.
Deletion and blocking: Blocking of data	Prevents the business users of SAP applications from displaying and using data that may include personal data and is no longer relevant for business activities. Only users with special authorization can display blocked data; they are not authorized, however, to create, change, or copy business objects with blocked data, or perform follow-on activities with these business objects.
Sample read access logging configurations	Sample read access logging (RAL) configurations are delivered for various applications. You can use RAL to monitor and log access to personal data. The information provided may include, for example, which business users accessed business partner personal data, and in which time frame. You can display and configure which read access information to log and under which conditions.
Information Retrieval	Supports the data subject's right to get information about their data that is being processed.
ILM Business Rule Creation	Simplifies the process of defining residence and retention rules for your ILM objects.

Key Feature	Use
Consent Administration	Provides functions to import consent records as copies and to search for and display stored consent records.

2.3 Industry coverage in SAP S/4HANA Enterprise Management

Industry coverage

SAP S/4HANA Enterprise Management contains core functions for the industries listed below. Extended industry functions you will find in chapter **SAP S/4HANA Industry-Specific LoB Functions**.

Industry Cluster	Industry
Consumer	• Consumer Products • Wholesale • Life Science • Retail including fashion and vertical business
Discrete	• Aerospace & Defense • High Tech • Industrial Machinery and Components • Automotive
Energy & Resources	• Chemicals • Mining • Mill Products • Utilities
Financial Services	• Banking • Insurance
Public Services	• PS & Postal
Services	• Engineering, Construction, and Operations • Professional Services • Telecommunications
Sports & Entertainment	• Sports & Entertainment
Transportation & Logistics	• Transportation & Logistics

2.4 Asset Management

2.4.1 Maintenance Management

2.4.1.1 Plant Maintenance Master Data

Business Background

By mapping your operational structures to technical objects, you can efficiently manage and evaluate your technical assets and maintenance objects and monitor the costs involved. Structuring the existing technical systems on the basis of technical objects reduces the time required for managing the technical objects and allows a faster evaluation of maintenance data.

A functional location represents an area within a system or plant where an object can be installed. Functional locations are created in hierarchical structures and thus allow a spatial, functional, or process-oriented structuring of your systems. Individual maintenance objects are represented by pieces of equipment that are installed in functional locations. The usage times of a piece of equipment at a functional location are documented over the course of time.

Key Features

The following features support you with this process:

Key Feature	Use
Structuring Technical Objects Hierarchically and Horizontally	The functional location is an organizational unit that structures the maintenance objects of a company according to functional or process-related criteria. When creating a functional location and defining its place in the hierarchical structure you define where a piece of equipment can be installed. Pieces of equipment can be installed in different functional locations or in other pieces of equipment. As functional locations represent your company's operational structures, they are usually part of a hierarchical structure and you can summarize costs or other maintenance data for individual hierarchy levels. Based on the structure indicator, functional locations are automatically arranged in the structure when you create them. You can also create hierarchical equipment structures if you want to divide large pieces of equipment into smaller units. If you want to structure your technical systems horizontally, you can create object networks. Object networks are represented by links between various pieces of equipment or functional locations.

Key Feature	Use
Creating Master Records for Functional Locations and Pieces of Equipment	Once the structure of the asset is defined, you can create a master record for each functional location and piece of equipment and specify general data, location data, organizational data, and structure data as well as edit classification data and characteristic values, and assign documents. • You can assign a bill of material (BOM) to the master record of a functional location or piece of equipment. • After having created characteristics and classes, you can assign this classification information to the master records of equipment and functional locations. If you have to manage a large number of objects, the classification enables you to easily locate your objects and group them together for evaluations. • You can serialize a piece of equipment by assigning a material number and serial number to it. This makes inventory management possible for the equipment. • A piece of equipment that is installed in a technical object can store the history of its installation location. The system records a usage period for each installation location, enabling you to track the complete installation history. • You can maintain fleet information, such as data pertaining to the engine and fuel, in the equipment master record. You can represent objects that are not repaired but rather exchanged in case of a breakdown by creating master records for materials and assemblies. Although this does not enable you to document a maintenance history, a material or assembly can also serve as a reference object for a maintenance notification or order.
Creating Maintenance Bills of Materials (BOMs)	A maintenance bill of material (BOM) is a complete, formally structured list of the components making up a technical object or an assembly. Maintenance BOMs support you when locating malfunctions by providing you with an overview of all components that make up a technical object. From this overview you can easily select the object for which you want to create a malfunction report. Furthermore, maintenance BOMs provide you with an overview of all spare parts used for the maintenance of a specific technical object, so they make spares planning considerably easier. A maintenance BOM contains the object numbers of the individual components together with their quantity and unit of measure, and can be assigned to the master record of a technical object or material.

Key Feature	Use
Reading Measuring Points and Counters and Creating Measurement Documents	Measuring points and counters are located on technical objects. They help you document the condition of a technical object at a particular point in time and support you in performing counter-based or condition-based maintenance. Documenting the condition of a particular object is of great importance in cases where detailed records regarding the correct condition have to be kept for legal reasons. This could involve critical values recorded for environmental protection purposes, as well as measurements of emissions and pollution for objects of all types. If you perform counter-based maintenance, maintenance activities are always performed when the counter of the technical object has reached a particular counter reading. In the case of condition-based maintenance, the activities are triggered when the measuring point of a technical object has reached a particular state. After a measurement has been taken at a measuring point or a counter, the data is stored in a measurement document. Based on that document the system calculates the next planned maintenance date and the call date on which a maintenance order is created. Each time you create a new measurement document, the system recalculates the planned date for the next maintenance work.
Accessing Context-Sensitive Information	In functional locations and pieces of equipment quickviews appear as separate popups when you hover over an object, and provide relevant information about the superior technical object or the installed piece of equipment. In technical objects you can open preconfigured side panels in a separate screen area and display context-sensitive charts and data. You can enhance the side panels to meet your requirements, thereby specifying which information you want to have displayed in the side panel.
Processing Master Data in the Information Center	You can use the *Information Center* to search for functional locations and pieces of equipment, and to call up technical objects from a personal worklist (POWL). Your personal worklist contains your favorites and objects that you have recently accessed or changed, and provides you with direct access to the Asset Viewer. You can personalize your worklist to your needs, sort table columns, and set filters.
Visualization of Technical Objects in the Master Data	With the SAP 3D Visual Enterprise Viewer, you can display graphics of technical objects right in the master data. You can display the graphic of the technical object as a thumbnail, as a 2D image or a 3D scene. In the 3D scenes, you can use various display functions, for example, you can pull the visualized model apart or rotate it, display a detailed view or a cross-section, as well as display associated parts lists.
Viewing Technical Objects in the Asset Viewer	The Asset Viewer is a display tool that enables simple navigation through complex object relations and flexible navigation within and between objects. You can also view and navigate the hierarchical structure of the technical object.

2.4.1.2 Maintenance Planning and Scheduling

Business Background

Maintenance Planning and Scheduling helps you optimize the scope of work and effort required for inspection, maintenance, and planned repairs. Based on legal requirements, manufacturer recommendations, and cost analyses, you determine which preventive maintenance tasks are required, which work centers are needed, and how frequently preventive maintenance tasks have to be processed to avoid breakdown time. Maintenance plans support you in specifying maintenance cycles, scheduling maintenance calls, and determining the expected costs for a specific time period. In maintenance task lists you can describe a sequence of individual maintenance activities which must be performed repeatedly within your company. In addition, you can use 2D and 3D model views to visualize technical objects, spare parts, and instructions as well as to find the spare parts you need for carrying out maintenance tasks quicker and easier.

Key Features

The following features support you with this process:

Key Feature	Use
Planning Complex Maintenance Cycles with Strategies	Maintenance strategies help you plan complex maintenance cycles. Based on legal requirements, manufacturer recommendations, and cost analyses, you use maintenance strategies to determine the sequence of planned maintenance and inspection tasks. Maintenance strategies contain maintenance packages with general scheduling information and can therefore be assigned to different maintenance plans. This reduces the time required for creating maintenance plans and allows you to update maintenance scheduling information easily.

Key Feature	Use
Processing Maintenance Plans	To plan recurrent maintenance work, you can create time-based and performance-based maintenance plans, strategy plans, and multiple-counter plans. In time-based maintenance planning, maintenance is performed in specific cycles, for example, every two months or every six months. With performance-based maintenance plans, you can plan regular maintenance based on counter readings maintained for measuring points of pieces of equipment and at functional locations. • You can create and assign maintenance items that describe which preventive maintenance tasks should take place regularly for a technical object or a group of technical objects. You can assign a task list to the maintenance item to specify the individual work steps that must be executed, the spare parts and tools required for the job, as well as the required completion time. • You can determine the maintenance cycles as planning data. If the maintenance plan is a strategy plan, the assigned maintenance strategy determines the maintenance cycles. If the maintenance plan is performance-based, you can assign counters. Furthermore, you can specify other scheduling information, such as shift factors. • You can view the scheduled maintenance calls for the maintenance plan. • You can determine the expected costs for a specific period. The system calculates the costs based on existing calls and uses maintenance packages and cycles as well as assigned task lists as sources for estimating costs. When you schedule the maintenance plan and generate maintenance calls, the system generates maintenance call objects (for example, maintenance orders or maintenance notifications) for the due date, and copies the relevant planning data into the call object. You can display the scheduled calls using the call history.

Key Feature	Use
Planning Recurrent Maintenance Work with Task Lists	Maintenance task lists describe a sequence of individual maintenance activities which must be performed repeatedly within a company. They contain important information about the spare parts and tools required for the work steps, the work centers involved, and the time required to perform the work. As a maintenance planner, you can use task lists to standardize these recurring work sequences and to plan inspections, maintenance, and repairs more effectively. Furthermore, task lists enable you to react quickly to changing environmental protection or occupational safety regulations that may affect continuous maintenance. You can create a general task list or a task list for a specific piece of equipment or functional location: • You can provide general information, such as the responsible work center and plant, the status, and the maintenance strategy. You can also specify a validity date that can be today's date or a date in the past or future. • You can specify the required spare parts by assigning material components from the bill of material or adding materials that are not in the BOM of the maintenance object. • You can determine which production resources or tools are required to perform the maintenance tasks, such as measuring and inspection instruments or cranes. • You can describe the chronological interdependence between the maintenance tasks and create relationships between operations. • You can create, display, and assign documents. • You can perform cost analyses that allow you to see which of the operations described have created which costs in a maintenance task list. This enables you to control your costs without creating an order. You can use task lists to detail out the individual work steps which must be executed as well as the spare parts and tools required for the job and the required completion time. When you then assign a task list to a maintenance item, maintenance notification, or an order, the system copies this maintenance data from the task list into the respective maintenance document.
Performing Inspection Rounds	You can plan and perform inspection rounds on different technical objects on a regular basis. The work activities in a round are similar and require the same tools, replacement parts, and qualifications while the number of technical objects may vary, depending on the sequence and the time required. An inspection round can involve functional locations, pieces of equipment, and measuring points or counters. You can assign an inspection round to a work center or a person. In an inspection round, you enter technical objects at the operation level of task lists or maintenance orders.

Key Feature	Use
Accessing Context-Sensitive Information	In maintenance plan and task lists you can open quickviews and side panels to gather further information. Quickviews appear as separate popups when you hover over an object, and provide relevant information about the technical objects or the long text. You can open preconfigured side panels in a separate screen area and display context-sensitive charts and data. You can enhance the side panels to meet your requirements, thereby specifying which information you want to have displayed in the side panel.
Processing Maintenance Plans and Items from a Personal Object Worklist	The *Maintenance Plan and Maintenance Item List* is an individually configurable worklist (POWL) that allows you to display and process all maintenance plans and items that match the selection criteria in the query you have defined. The POWL provides the most important information about maintenance plans and items, enables you to carry out mass data changes and to navigate to the assigned technical objects. You can configure the list layout, sort table columns, and create filters.
Selecting Spare Parts and Viewing Visual Instructions in Task Lists	With the SAP 3D Visual Enterprise Viewer, you can use functions to visualize technical objects, spare parts and instructions. 2D and 3D model views as well as animated scenes make critical maintenance processes such as finding the spare parts you need and carrying out maintenance tasks quicker and easier. Users can only display the 2D images and 3D scenes that have been published within their company. While working in a task list you can select spare parts from a 2D or 3D model view and copy them to the spare parts list. You can also watch visual instructions on how to carry out your maintenance tasks. Visual instructions can be animated 3D scenes that visualize each and every maintenance step at operation level, for example.
Viewing Relationships between Maintenance Objects in the Asset Viewer	The Asset Viewer is a display tool that enables simple navigation through complex object relationships and flexible navigation within and between objects. You can also view and navigate through the hierarchical structure of technical objects.

2.4.1.3 Maintenance Execution

Business Background

Maintenance Execution allows you to perform planned and unplanned maintenance tasks. Maintenance planners can carry out preliminary costing, work scheduling, material provisioning, and resource planning. They provide maintenance workers with job lists so that they have easy access to all maintenance-related information. This leads to increased efficiency and productivity. Maintenance workers can review the jobs assigned to them and carry out the required maintenance work based on the tasks and operations in the order. While confirming that they have finished the job, they can enter measurement readings, which the system records in measurement documents.

Key Features

The following features support you with this process:

Key Feature	Use
Reporting a Malfunction Using Notifications	As a maintenance planner or worker you can report a malfunction or a problem at a technical system by creating a notification in which you specify the technical object, describe the malfunction, and enter the activities to be performed. Hierarchical structure lists support you in specifying the technical object and provide you with information about assigned materials and components. You can enter breakdown information, describe the damages and causes, and enter tasks and activities. By choosing the appropriate codes for describing the damages and malfunctions as well as what caused the damage, you ensure that issues can be entered in a standardized way and therefore be evaluated automatically. Having completed your work, you can confirm the time spent on each activity. To add further information, you can upload and attach documents to the notification. You can print out the shop paper of the notification physically or virtually on the job card and by doing so, transfer the notification to the job list.
Planning and Executing Maintenance Work Using Maintenance Orders	When a malfunction is detected, the maintenance planner can use a maintenance order to detail out the maintenance tasks that are to be performed on the technical object. As a planner, you can create a maintenance order for a specific notification or create the maintenance order directly with or without reference to an existing order. When creating or changing a maintenance order, you can either assign existing task lists and notifications or create new ones for the order. In the maintenance order, you provide all the information needed to plan and execute the maintenance work. That includes start and finish dates, location information, planned materials and production resources/tools. The system supports you in finding the relevant technical object, choosing the required materials and checking their availability, scheduling the job, and determining the costs: • You can specify the technical objects using a hierarchical list. • You can choose the required materials using a catalog. When you plan materials for executing order operations, you can display whether the materials planned for the operation are available on time and in sufficient quantity. • After you have planned an order with all its operations and components, you can use the scheduling function to determine the actual execution dates, the capacity requirement needed to execute the order, and the date on which a particular material should be available. • You can determine costs and run cost simulations. For inspection rounds, you can enter technical objects and assemblies at operation level and assign measuring points as production resources/tools to the technical objects. To add further information, you can upload and attach documents to the order. You can print out the shop paper of the maintenance order physically or virtually on the job card and by doing so, transfer the order to the job list.

Key Feature	Use
Processing and Confirming Maintenance Jobs	Job lists and confirmation lists support maintenance workers in processing and confirming maintenance jobs. • Job lists provide a list of maintenance jobs to be carried out, as well as crucial information for each job at a glance, such as the urgency, start and end dates, and assigned work center. You can configure job lists so that they reflect how work is organized in your particular organization and therefore only contain the jobs that are relevant to you. • Confirmation lists contain all the planned maintenance jobs that can be confirmed. As a maintenance worker, you can check the planned job data and confirm or adjust it. That includes the time you spent on the job and the materials you consumed as well as the activities you performed and the measurement readings. Depending on how confirmation is done in your company, you can configure different confirmation lists. As a maintenance worker, if you fix a problem at a technical system, you can also confirm this unplanned job and enter all the required data after having finished your work. You then can enter the time spent and the required materials, write a long text and, if necessary, create an activity report. The system automatically creates an order and - if an activity report exists - a notification, sets the order and notification to *technically completed*, stores the time confirmation, and posts a goods issue for the order. You can also confirm unplanned jobs while working in the Asset Viewer.
Accessing Context-Sensitive Information	In maintenance notifications and orders you can open quickviews and side panels to gather further information. Quickviews appear as separate popups when you hover over an object, and provide relevant information about the assigned notification or order, technical objects, materials, activities, statuses, and long texts. You can open preconfigured side panels in a separate screen area and display context-sensitive charts and data, such as context-sensitive master data or information about vendors and customers. You can enhance the side panels to meet your requirements, thereby specifying which information you want to have displayed in the side panel.
Processing Maintenance Documents in the Order and Notification Information Center	The *Order and Notification Information Center* is a central point of access to several worklists that you can use for processing all your notifications and orders. You can access worklists for notifications, orders, and order operations, or use the combined *Order and Notification List*. The worklists allow you to display and process all maintenance notifications and orders that match the selection criteria in the query you have defined. You can configure the list layout, sort table columns, and create filters. In addition, you have the option of displaying table columns for monitoring critical dates and costs, whose colors help you detect issues. Furthermore, the lists enable you to change the status of orders and notifications and provide a mass data change function. In the combined *Order and Notification List*, you can also display the assignments of notifications to orders.

Key Feature	Use
Selecting Spare Parts and Viewing Visual Instructions in Maintenance Orders	With the SAP 3D Visual Enterprise Viewer, you can use functions to visualize technical objects, spare parts, and instructions. 2D and 3D model views as well as animated scenes make critical maintenance processes such as finding the spare parts you need and carrying out maintenance tasks quicker and easier. Users can only display the 2D images and 3D scenes that have been published within their company. While working in a maintenance order you can select spare parts from a 2D or 3D model view and copy them to the spare parts list. You can also watch visual instructions on how to carry out your maintenance tasks. Visual instructions can be animated 3D scenes that visualize each and every maintenance step at operation level, for example. If you have set up the conversion accordingly, you can even convert the visual instructions assigned to a maintenance order to PDF format, use them on job cards, and print them out.
Viewing Relationships between Maintenance Objects in the Asset Viewer	The Asset Viewer is a display tool that enables simple navigation through complex object relationships and flexible navigation within and between objects. You can also view and navigate through the hierarchical structure of technical objects.

2.5 Finance

2.5.1 Financial Planning and Analysis

2.5.1.1 Cost Management and Profitability Analysis

2.5.1.1.1 Overhead Cost Accounting

Business Background

This application area covers the journal entries for Overhead Cost Accounting. It captures costs by cost center and defines the output of the cost center in terms of activity types. It allows you to enter statistical key figures as a basis for your allocations at period close.

Key Features

The following features support you with this process:

Key Feature	Use
Master data in cost accounting	You can create various types of master data, such as • Cost centers • Cost center groups • Activity types • Activity type groups • Statistical key figures • Statistical key figure groups • Internal orders • Projects
Activity prices	You can enter activity prices for any combination of cost center and activity type. Activity prices are needed to provide the charge basis for the internal activities.
Statistical key figures	You can enter statistical key figures, which serve as a basis for internal allocations.
Overhead allocation	You can allocate costs, for example, between cost centers, which is a typical task during the monthly closing process.
Budget availability control	You can control the budgets in your cost centers. The available budget is checked with each expense posting to determine whether the budget consumption has reached a defined limit.
Reporting	You can report on actual and plan data for selected periods for the following objects: • cost centers • market segments • P&L statements • functional areas • profit centers • internal orders • projects

2.5.1.1.2 Product Cost Management

Business Background

This business area allows you to determine the costs incurred by your products and services in order to successfully manage your product portfolio. These cost can be broken down into each step of the value chain leveraging the superior capabilities of an integrated S/4HANA system, while mapping the quantity flow from the logistical area with the values of Finance. Product Cost Management is key for your company's inventory valuation.

The approach to Product Cost Accounting is determined by the type of manufacturing process. In an engineer-to-order or make-to-order environment, the focus is on the costs for individual sales orders. In a make-to-stock environment, the focus is on the costs for the individual production orders or process orders. In a repetitive manufacturing environment, a period-based cost controlling may replace the individual order.

Key Features

Key Feature	Use
Product costing	Assign costs to individual units of products and services.
Product costs by sales order	Determine costs for sales orders in engineer-to-order or make-to-order environments.
Product cost by manufacturing order	Determine costs for production orders and process orders in make-to-stock environments.
Period costs	Determine period-based costs in repetitive manufacturing environments using product cost collectors as the cost object.
Material inventory values	Report on quantities and values of the material inventory. You can also report on rounding differences between the current stock postings of the actual stock and the calculated stock.

2.5.1.1.3 Profitability and Cost Analysis

Business Background

This application area enables you to analyze the profitability of your market segments and cost objects. It shows contribution margins in real time and offers detailed views for further analysis.

You can analyze market segments by product, product group, customer, customer group, and sales organization.

Key Features

Key Feature	Use
Revenue and cost of sales	Provide information on revenue and cost of sales to support internal accounting and decision-making.
Overhead allocation to profitability	You can allocate your overhead costs from cost centers to market segments using a periodic run.
Settlement	Settle projects to capitalize the balance from results analysis and include it in the contribution margin for Enterprise Controlling. Settle orders to include production variances in the contributions margin.
Real-time profitability reporting	Attributed profitability segments support real-time profitability reporting for market segment attributes such as Customer, Customer Group, Product, Product Group, or Sales Organization to support your internal accounting and decision-making. This approach can sometimes replace the use of allocation and settlement.
Event-based revenue recognition	Event-based revenue recognition posts recognized revenue for every cost posting on simple customer projects. It applies the matching principle for costs and revenues, so the reported margin is always up to date. For example, if a customer project has the contract type Fixed Price or Time & Material, each time confirmation immediately triggers a revenue recognition line item.
Realignment of market segment attributes	You can update and adjust your posted market segment attributes (excluding all GL-relevant information) without affecting your financial data, for example after organizational changes or master data corrections.
Journal Entries for Statistical Sales Conditions	Journal entries for statistical pricing conditions in customer invoices can be posted to an extension ledger in Financial Accounting to enhance information relevant for management reporting in Finance.

2.5.1.1.4 Predictive Accounting

Business Background

Predictive accounting helps you to predict future results using the data from documents, such as sales orders, before actual journal entries are created for them in Finance. You can use the predictive journal entries for these source documents in your analysis and reporting to get a better understanding of what your financial results might look like, at the end of the current period or quarter, and why.

Key Features

The following table explains the key features available:

Key Feature	Use
Predictive analysis of incoming sales orders	You can use this feature to perform an analysis of the predicted margins for incoming sales orders. This analysis is based on predictive journal entries for goods issues and billing documents using the most up-to-date sales order data in SAP S/4HANA or from an external system. Predictive accounting then allows you to analyze presumed profits, based on incoming sales orders. In addition, it considers actual values and their effects on reducing the respective predicted values.
Predictive analysis of travel requests	SAP S/4HANA supports the integration with a travel management system (currently SAP Concur) to calculate predictions based on travel request data. When a travel management system (for example, SAP Concur) is integrated and provides travel request data, you can use this feature to perform an analysis of the impact of travel expenses on your planned budget. This analysis is based on predictive journal entries for travel requests and expense reports.

2.5.2 Accounting and Financial Close

2.5.2.1 Accounting

2.5.2.1.1 General Ledger

Business Background

You use the general ledger to perform the necessary tasks of financial accounting.

Key Features

As a general ledger accountant, you can use the following functions:

Key Feature	Use
Master Data	You can manage master data for profit centers, profit center groups and G/L accounts. If you specify profit centers in postings, you can create a profit and loss statement (P&L) for profit centers and a financial statement for internal purposes. G/L account master data defines how business transactions are posted on G/L accounts and how the posting data is processed. The directory of all G/L accounts is the chart of accounts.
Postings and Journal Entries	You use journal entries to reflect business transactions. You can manage open items by reversing or clearing open items for example. You can also reset a clearing. You can create recurring entries for journal entries that are repeated regularly. For external and internal accounting there is the universal journal. A posting is made for every business transaction that is relevant for General Ledger Accounting, Asset Accounting, Controlling (with the exception of costing-based profitability analysis) and the material ledger. External and internal accounting are constantly reconciled, which means separate reconciliations between Financial Accounting and Controlling, as well as between General Ledger Accounting and Asset Accounting, are not necessary.
Closing Operations and Reporting	For closing operations at period-end closing, you can use the programs available for analyzing, valuating, and reclassifying the journal entries. Using Accruals Management, you can post expenses in the period in which they are incurred or probably will be incurred. With these closing operations, you create a balance sheet and a profit and loss statement (P&L). All accounting data is available simultaneously in each report that is based on the universal journal. Cost and revenue information is always up to date and is continuously reconciled with the profit and loss statement. There are different programs available for sales/purchases tax declarations and tax payable postings.
Parallel Accounting	You can manage General Ledger Accounting in accordance with several accounting principles simultaneously, for example with a local accounting principle and the accounting principle of a corporate group.

2.5.2.1.1.1 General Ledger Enhancements

Business Background

The general ledger enhancements help companies and banks to comply with regulatory requirements, improve financial reporting accuracy, and reduce the number of days to close the books.

Key Features

The following table explains the key features available. Multi Currency Accounting and Average Daily Balances are available for banks only:

Key Feature	Use
Multi-Currency Accounting	Allows banks to manage foreign currency risk from an economic, accounting, and regulatory perspective.
Error Correction and Suspense Accounting	Allows companies and banks to process upstream general ledger interfaces and streamline error correction and suspense accounting while ensuring the data quality of the enterprise general ledger as required by regulatory agencies.
Average Daily Balances	Allows banks to continuously analyze the financial condition and health of the balance sheet on time.

2.5.2.1.2 Asset Accounting

Business Background

You use Asset Accounting to manage and monitor tangible fixed assets. It provides detailed information about the transactions relating to tangible fixed assets.

Prerequisites

To be able to use Asset Accounting, you have to also use General Ledger Accounting.

For more information, see General Ledger [page 26].

Key Features

As an asset accountant, you can use the following functions:

Key Feature	Use
Master Data	You can use the asset master record to create, edit, and manage the master data of Asset Accounting.
Asset Acquisitions and Asset Retirements	You can post asset acquisitions integrated with accounts payable accounting or not integrated. Similarly, you can post asset retirements integrated with accounts receivable accounting or not integrated. In addition to this, there are more functions available for asset acquisitions and retirements.
Depreciation	With depreciation you map impairments incurred or impairments that are due to tax law requirements.
More Transactions, Reversal	More transactions, for example post-capitalizations are available. You can reverse documents that are posted in Asset Accounting.
Postings and Documents	Asset Accounting is based on the universal journal entry. General Ledger Accounting and Asset Accounting are therefore reconciled per se; this means that reconciliation postings are not necessary as part of closing operations.
Closing Operations and Reporting	You post the depreciation amounts periodically, directly in General Ledger Accounting. Create an asset history sheet to represent the development of the fixed asset from the opening balance through to the closing balance. More tools for the reporting and analysis of asset portfolios, asset transactions, and depreciation (including depreciation forecast and simulation) are also available.
Parallel Accounting	You can manage Asset Accounting in accordance with several accounting principles simultaneously, for example with a local accounting principle and the accounting principle of a corporate group. This happens in the same way as in General Ledger Accounting. Separate documents are posted for each accounting principle.

2.5.2.1.3 Revenue and Cost Accounting

Business Background

You use Revenue and Cost Accounting to recognize revenues and to calculate contract liabilities and contract assets.

Prerequisites

To be able to use Revenue and Cost Accounting, you also have to use General Ledger Accounting.

For more information, see General Ledger [page 26].

Key Features

The key features available in Revenue and Cost Accounting are as follows:

Key Feature	Use
Revenue Accounting and Reporting	The system creates revenue accounting contracts corresponding to revenue documents (sales orders, contracts, bills, invoices, and so on) that are created and managed in an operational system (such as Sales and Distribution, Billing and Revenue Innovation Management (BRIM), or other third-party systems). These contracts are then brought into the system through built-in integration.
	The system identifies performance obligations included in each revenue accounting contract. The system then creates performance obligations for items in the operational document and manages the relationships between them.
	The system also determines the total price by aggregating the pricing conditions and then allocating the total price across the performance obligations identified.
	The system recognizes revenue for performance obligations as they are fulfilled by various fulfillment events (percentage of completion, shipment events), either at a point in time or over time.
	The system calculates the contract liability and contract asset values and then makes postings to the general ledger to reflect revenue-related recognition transactions.

Key Feature	Use
	The system provides out-of-the-box analytical reports that can be used to monitor and analyze your data in the system. You can use Core Data Services (CDS) views to create analytical reports to help meet additional company disclosure requirements.
Event-Based Revenue Recognition	Event-Based Revenue Recognition posts recognized revenue for cost postings for projects and sell-from-stock orders. With Event-Based Revenue Recognition, costs and revenues are recognized as they occur. Cost postings are continuously matched to revenues and immediately reported as expenses, while revenues are posted to an income statement account. Recognition and adjustment postings are generated simultaneously with the transactions. The matching principle is supported inherently. Event-Based Revenue Recognition is fully integrated with General Ledger. The recognition data is stored in the same location as the cost and revenue data.

2.5.2.1.4 Inventory Accounting

Business Background

You use Inventory Accounting to value and monitor your material and work-in-process inventories according to legal regulations and management accounting requirements. All goods movements are valued in the Material Ledger which supports parallel, real-time valuation of inventories in multiple currencies. A special focus lies on high throughput of logistics data that allows for managing massive data volumes.

You can choose to value your material inventories at standard cost or moving average automatically. In addition, you may make manual adjustments to material costs and inventory values. You may also use periodic valuation of material inventories according to statutory requirements (such as Lowest Value, LIFO, or FIFO) or product cost management requirements (such as actual costing or standard costing).

Key Features

Key Feature	Use
Automatic Valuation of Material Inventories	Valuation of material inventories in multiple currencies in parallel
Optional Price Controls for Materials	Perpetual valuation of material inventories and movements at standard cost or moving average

Key Feature	Use
High Throughput of Logistics Data	Manage high logistics data volume
Manual Adjustments to Material Costs and Inventory Values	Adjust material costs and inventory values manually
Periodic Valuation of Material Inventories	Valuation of material inventories according to statutory or product cost management requirements
Analyze Inventory Values	Real-time line item reports aggregated to inventory positions on the fly, with drill-down capabilities

2.5.2.1.5 Accounts Payable

Business Background

Invoices are created in purchasing and submitted to accounts payable. As an accounts payable accountant, when you receive an invoice, you can view key performance indicators (KPIs) for the invoice and process the invoice.

Key Features

The following features support you with this process:

Key Feature	Use
Import of supplier invoices	You use this feature to import multiple supplier invoices all at once.
Analysis of payments to suppliers	You use this feature to view information about payments to suppliers. You can check the overdue payable amount and the future payable amount. If you identify negative trends in the payable amount, you can notify the responsible persons to take action.
Management of cash discounts	You use this feature to forecast the available cash discounts and to monitor the cash discount utilization in your responsible area. You can find out where you need to make better use of cash discounts in order to avoid cash discount loss in the future.
Reviewing of cleared overdue invoices	You use this feature to get details and statistical facts about cleared overdue invoices.

Key Feature	Use
Evaluation of days payable outstanding	You use this feature to identify suppliers with the highest or the lowest days payable outstanding.
Management of payments	You use this feature to create, post, and, if necessary, reverse payments.
Management of payment blocks	You use this feature to set and remove payment blocks on invoices or supplier accounts. You can identify irregularities or potential fraud in invoices through integration with SAP Fraud Management for SAP S/4HANA*.
Management of payment proposals	You use this feature to revise and release payment proposals. Journal entries are then generated in the finance system.
Management of payment media	You use this feature to transfer the data required for electronic payment transactions to banks via a data medium. A payment medium is created with each successful payment run.

*SAP Fraud Management for SAP S/4HANA is co-deployed with SAP S/4HANA. SAP Fraud Management for SAP S/4HANA is not part of SAP S/4HANA Enterprise Management, but part of the add-on SAP Assurance and Compliance Software for SAP S/4HANA, for which you need a separate license.

2.5.2.1.6 Accounts Receivable

Business Background

Accounts Receivable allows you to record and manage accounts receivable data of all customers. All postings to accounts receivable are triggered in response to operative transactions in sales and logistics. Simultaneously, postings are recorded in the general ledger. Different general ledger accounts are updated depending on the transaction involved, such as receivables, down payments or bills of exchange. Customer line items are cleared when incoming payments are received.

You can monitor open items by using, for example account analyses, due date lists and a flexible dunning function. You can adjust the correspondence forms to your requirements, as well as payment notices, balance confirmations, account statements, and interest calculations. You can assign incoming payments to receivables due. The payment function automatically executes direct debiting and down payments. A range of tools allows you to document transactions in accounts receivable, such as balance lists, journals, balance audit trails and other standard reports.

Prerequisites

To use accounts receivable, you have to also use general ledger.

For more information, see General Ledger [page 26].

Key Features

The following table explains the key features available:

Key Feature	Use
Master Data	You can manage and store your customer data as business partner data. You can create and change customer data using the business partner, so that you do changes, for example, in address data, only once.
Monitoring of Receivables	You can display overdue receivables and customer balances. In addition, you can process individual customer items.
Posting Business Transactions	You can post accounting data for customers in accounts receivables and the data entered is transferred to the general ledger. General ledger accounts are updated according to the transaction concerned (receivable, down payment, bill of exchange, and so on).
Clearing of Open Invoices	You can post incoming payments and either manually clear open items or have them cleared automatically by the system.
Correspondence	You can send correspondence to your customers, such as payment notices, open item lists, balance confirmation or account statements. You can adjust the forms for the correspondence according to your requirements.
Periodic Activities and Closing Operations	You can prepare and carry out periodic activities, such as automatic payment or dunning, or activities that arise for day-end closing, month-end closing or year-end closing.
Analytics	You can carry out evaluations and analyses for your customers, such as payment history, currency risk or Days Sales Outstanding (DSO) analysis.

2.5.2.2 Financial Close

2.5.2.2.1 Entity Close

Business Background

You can perform local close for one or several companies of your corporate group monthly, quarterly, yearly, or at other intervals with a freely definable range of closing operations. Local accounting principles and/or principles applied by the group can be taken into account.

Key Features

Closing operations include the following tasks:

- Maintain exchange rates
- Execute recurring entries
- Clear open items
- Perform inventory and post inventory differences
- Reclassify clearing account for goods receipt/invoice receipt
- Valuate materials
- Perform closing operations in the subsidiary ledgers
- Perform foreign currency valuation
- Reclassify receivables and payables
- Use functions for tax on sales/purchases
- Perform reconciliation between affiliated companies:
  Intercompany reconciliation allows you to match transaction data according to predefined rules and reconcile balances for paired accounts. You can check the matching and reconciliation results and perform follow-up activities.
- Close posting period and open new posting period
- Display financial statements
- Execute balance carryforward
- Evaluate financial statements

2.5.2.2.2 Corporate Close - Data Preparation

Background

You use data preparation to create and monitor your financial data collection for corporate close, either for legal purposes or for the purposes of consolidated management reporting. This process offers a high degree of flexibility regarding the data collection process as well as the configuration of different accounting principles. You can highly integrate with the accounting solution to automate the consolidation data collection process.

For enhanced corporate close capabilities including master data creation, data preparation, consolidation, and reporting, see Group Reporting [page 303].

Key Features

The following features are available to you as a consolidation expert:

Key Feature	Use
Master Data	You define specific accounting master data objects in preparation for consolidation such as the definition of a legal company for the trading partner derivation.
Modeling	A model bundles characteristics and key figures, customizations, and consolidated results into a separate consolidation context. In the modeling process, you choose the fields that are needed for consolidation dimensions, and join them with other configuration settings to form the data basis for consolidation.
Data Collection	You can collect individual financial statement data from SAP systems as well as non-SAP systems. Various procedures are available for doing this.
Data Validation	You can define validation rules and assign the rules to various dimension combinations to verify the data quality before releasing data for consolidation use.

2.5.2.3 Compliance Formats - Preparation Support

Business Background

You can create, process, and monitor electronic documents and statutory reports.

Please note that not all features are provided for each and every country/region. For more information about the available features for a country/region, please check the country/region-specific documentation on the SAP Help Portal.

Key Features

The following table explains the key features available:

Key Feature	Use
Setup of reporting entities	You can define reporting entities you need to fulfill compliance requirements for your organization. You can also configure the relevant attributes.

Key Feature	Use
Generation, display, and download of electronic documents and statutory reports	You can generate electronic documents or statutory reports in certain formats. Where legally required, you can also generate correction, additional correction, and clarification runs for statutory reports and business correspondence for electronic documents and statutory reports. You can display and download electronic documents and statutory reports. You can choose to generate statutory reports immediately, or schedule the report generation for a later point in time. You can also cancel the report runs that are in process. Where supported, you can generate ad-hoc statutory reports.
Display	Where supported, you can display the electronic document or statutory report in its raw file format.
Basic monitoring and audit log	You can monitor the compliance status and due dates of the supported statutory reports. You can view and process the activities that are relevant for completing your compliance reporting scenario. A basic audit log is provided. You can upload complementary compliance attachments to your statutory reports, supporting your audit needs.
Status tracking of manual submissions	Depending on local requirements, submission to authorities can be achieved by downloading the ready to use format and manually submitting it to the authorities or entering the data in the tax portal based on ready to use reporting data.

> **i Note**
>
> These features are part of SAP S/4HANA Enterprise Management. On top of these features, SAP S/4HANA provides additional features which require an additional license. For the list of additional features see, Document and Reporting Compliance [page 306].

2.5.3 Treasury Management

2.5.3.1 Cash and Liquidity Management

Business Background

To preside over the cash assets of a company, cash managers need to closely monitor cash positions, centrally manage banks and bank accounts, and regularly forecast the liquidity trends of the organization.

Key Features

Key Feature	Use
Cash Positions	You can use this feature to check the actual and forecasted cash positions to assist cash allocation decision-making.
Banks and House Banks	You can use this feature to display, create, and change data about the banks that your company, your customers, and your suppliers use to transact business.
Bank Account Master Data	You can use this feature to centrally manage the master data of your company's corporate or business bank accounts, as well as house bank accounts.
Liquidity Forecast	You can use this feature to forecast the future liquidity trend.
Memo Record	You can use this feature to create memo records manually and edit memo records in a list.

2.5.4 Financial Operations

2.5.4.1 Invoice and Payables Management

2.5.4.1.1 Accounts Payable

Business Background

Invoices are created in purchasing and submitted to accounts payable. As an accounts payable accountant, when you receive an invoice, you can view key performance indicators (KPIs) for the invoice and process the invoice.

Key Features

The following features support you with this process:

Key Feature	Use
Import of supplier invoices	You use this feature to import multiple supplier invoices all at once.
Analysis of payments to suppliers	You use this feature to view information about payments to suppliers. You can check the overdue payable amount and the future payable amount. If you identify negative trends in the payable amount, you can notify the responsible persons to take action.
Management of cash discounts	You use this feature to forecast the available cash discounts and to monitor the cash discount utilization in your responsible area. You can find out where you need to make better use of cash discounts in order to avoid cash discount loss in the future.
Reviewing of cleared overdue invoices	You use this feature to get details and statistical facts about cleared overdue invoices.
Evaluation of days payable outstanding	You use this feature to identify suppliers with the highest or the lowest days payable outstanding.
Management of payments	You use this feature to create, post, and, if necessary, reverse payments.

Key Feature	Use
Management of payment blocks	You use this feature to set and remove payment blocks on invoices or supplier accounts. You can identify irregularities or potential fraud in invoices through integration with SAP Fraud Management for SAP S/4HANA*.
Management of payment proposals	You use this feature to revise and release payment proposals. Journal entries are then generated in the finance system.
Management of payment media	You use this feature to transfer the data required for electronic payment transactions to banks via a data medium. A payment medium is created with each successful payment run.

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2.5.4.1.2 Dynamic Discounting (Business Network Integration)

Business Background

If you have enabled discount management for suppliers on a business network (for example, Ariba Network), you can manage cash discounts from initial offer through to agreement. This optimization of cash discounts can increase your company's profits, and gives your suppliers the opportunity to receive their payments earlier.

Key Features

Key Feature	Use
Open payables	Send information about open payables to the business network (for example, Ariba Network).
Updates to open payables	Send updates to information already sent to the business network (for example, Ariba Network) about open payables if there are changes that impact the negotiations about early payment.

Key Feature	Use
Adjustments to open payables	Receive information from the business network (for example, Ariba Network) about adjusted cash discounts and due dates of open payables.
Monitoring	Monitor, troubleshoot, resend, and cancel outbound messages.

2.5.4.1.3 Payment Advice Collaboration (Business Network Integration)

Business Background

You are able to collaborate with your suppliers by sending them payment advices via a business network (for example, Ariba Network). These payment advices are based on the results of a payment run and explain the payments made to your suppliers.

Key Features

Key Feature	Use
Payment advices	Send payment advices to suppliers via the business network (for example, Ariba Network).
Monitoring	Monitor, troubleshoot, resend, and cancel outbound messages.

2.5.4.2 Receivables Management

2.5.4.2.1 Accounts Receivable

Business Background

Accounts Receivable allows you to record and manage accounts receivable data of all customers. All postings to accounts receivable are triggered in response to operative transactions in sales and logistics. Simultaneously, postings are recorded in the general ledger. Different general ledger accounts are updated depending on the transaction involved, such as receivables, down payments or bills of exchange. Customer line items are cleared when incoming payments are received.

You can monitor open items by using, for example account analyses, due date lists and a flexible dunning function. You can adjust the correspondence forms to your requirements, as well as payment notices, balance confirmations, account statements, and interest calculations. You can assign incoming payments to receivables due. The payment function automatically executes direct debiting and down payments. A range of tools allows you to document transactions in accounts receivable, such as balance lists, journals, balance audit trails and other standard reports.

Prerequisites

To use accounts receivable, you have to also use general ledger.

For more information, see General Ledger [page 26].

Key Features

The following table explains the key features available:

Key Feature	Use
Master Data	You can manage and store your customer data as business partner data. You can create and change customer data using the business partner, so that you do changes, for example, in address data, only once.
Monitoring of Receivables	You can display overdue receivables and customer balances. In addition, you can process individual customer items.
Posting Business Transactions	You can post accounting data for customers in accounts receivables and the data entered is transferred to the general ledger. General ledger accounts are updated according to the transaction concerned (receivable, down payment, bill of exchange, and so on).
Clearing of Open Invoices	You can post incoming payments and either manually clear open items or have them cleared automatically by the system.
Correspondence	You can send correspondence to your customers, such as payment notices, open item lists, balance confirmation or account statements. You can adjust the forms for the correspondence according to your requirements.
Periodic Activities and Closing Operations	You can prepare and carry out periodic activities, such as automatic payment or dunning, or activities that arise for day-end closing, month-end closing or year-end closing.
Analytics	You can carry out evaluations and analyses for your customers, such as payment history, currency risk or Days Sales Outstanding (DSO) analysis.

2.5.4.2.2 Integration with Machine Learning Intelligence SAP Cash Application

Business Background

Financial Operations supports the integration with the machine learning system SAP Cash Application to allow users to optimize their banking processes.

Key Features

If SAP Cash Application is integrated, it supports the features listed below. SAP Cash Application enables you to use the following services:

Key Features	Use
Receivables Line-Item Matching	Provides proposals for matching receivables with incoming bank statement items and automatically clears them.
Receivables Line-Item Matching for Lockbox	Provides proposals for matching receivables with incoming lockbox files and automatically clears them.
Payables Line-Item Matching	Matching payables (supplierr invoices) are proposed for the supplier-initiated payments (bank statement items) and can be automatically cleared based on configured thresholds.
Customer Account Identification	Provides proposals for customer accounts to identify the payer of a bank statement item.
Payment Advice Extraction	This service extracts information about payments from unstructured payment advices in PDF format, and uses this information to automate the clearing process.

2.5.4.3 Settlement Management

Business Background

Settlement management involves all types of settlement processes, including core business processes that need to be fully integrated in the order-to-cash cycle or within in a procure-to-pay scenario, such as rebate settlement, as well as standalone processes, whereby special financial settlement services are provided for business partners.

Financial settlement processes are typically required for handling settlement transactions between third parties such as brokers and payment agencies. Benefits or services can be offered to the parties involved, such as del credere guarantees or simplified payment transactions, and settlement accounting for commissions can be performed.

In pooled payment, for example, an agency negotiates purchase price conditions and payment processing between the supplier and customer. The agency takes a commission from the customer and/or the supplier for services rendered. Transactions relating to the actual merchandise, for example, purchase orders and deliveries, can be carried out completely independently of the agency. For the purpose of payment processing and commission calculation, the agency can enter incoming invoices.

Key Features

The following table explains the key features available:

Key Feature	Use
Entry of remuneration settlements without reference to preceding transactions	• Handling of all ad-hoc remunerations made to a supplier or charges made to a customer In del credere business, this allows del credere payables to be separated from those resulting from purchases.
Entry of incoming invoices without reference to preceding transactions and creation of follow-on documents	• Entry of incoming invoices from a supplier to a customer • Grouping of documents in lists for multiple business partners for posting on specific dates • Entry of incoming invoices as a settlement document with direct posting to accounting or settlement using supplier settlement/supplier settlement list and a customer settlement/customer settlement list • Entry of incoming invoice lists as supplier settlement lists using a customer settlement/customer settlement list for the settlement on the customer side • Creation of follow-on documents to perform settlement accounting for payments and commission
Automatic determination of accounting-related data, such as terms of payment and cash discounts	• Price determination Calculation of del credere commissions, discounts, conditions, and other transactions involving prices using purchasing or sales pricing • Purchasing and sales account determination
Determination of document processing by document type	Use of different processing methods for different document types, such as invoices, credit memos, debit memos, pro forma invoices, and cancellation documents, for example, regarding the entry of default data, account and price determination, the creation of follow-on documents, and posting rules

Key Feature	Use
Integration with other solution capabilities	• Posting of documents as profitability analysis documents and thereby transfer incomes, rebates, and other documents to profitability accounting. • Transfer of documents to cash management to ensure that cash flow is planned in good time. • Use of credit management to define individual credit checks for the customers involved.
Forwarding of documents to accounting	• Posting of documents to accounting on saving a document or later by mass release A check can be implemented to ensure that only authorized persons can release documents for posting.
Mass processing of documents	Processing of documents and document lists individually or in batches (release, reverse, complete, reopen)
Monitoring of document flow and status	Tracking of documents from invoice entry through to posting to accounting
Message creation	Creation of messages for documents that support communication with business partners
Clearing	• Reconciliation of external documents, such as invoices or credit memos, with internal documents, such as transaction data • Invoice verification and clearing scenarios for settlement management processes • Clearing for both parties, either supplier or customer • Handling of differences as invoice reduction, accrual, accepted difference (internal adjustment), or other difference • Definition of tolerances for accepted differences
Complaints processing	Entry of complaints for a settlement document and recording and tracking of complaints
Intrastat processing	Creation and processing of documents that contain information relevant for the creation of Intrastat declarations
Condition contract management	• Get a compact overview of condition contracts that enables the user to display condition contract information and navigate directly to the documents. • Storage of agreements between business partners in the form of a condition contract A condition contract contains information, such as prices, conditions, and the validity of the agreement. It forms the basis for settling claims or rebates on suppliers or payables to customers. • Handling of pricing conditions only for a specific order-to-cash or procure-to-pay process based on a condition contract

Key Feature	Use
Accruals processing	Posting accruals based on relevant invoices to update the bonus entitlements for future customer or supplier settlements in accounting.
Archiving	Archiving of documents to remove volumes of data from the database that are no longer required in the system, but still need to be kept for analysis purposes
Integration of Settlement Management	• SAP S/4HANA Cloud supports the integration with an external commissions management system (currently SAP Commissions on SAP Sales) to allow the import of commissions data into SAP S/4HANA. • SAP S/4HANA supports the integration with an external HR system (for example, SAP SuccessFactors Employee Central) to initiate the payroll processing of commissions by providing personnel settlement documents.

2.5.5 Governance, Risk, and Compliance for Finance

2.5.5.1 International Trade

International Trade supports you in the following areas:

International Trade Classification

- Classification of products with commodity codes, Intrastat service codes and Customs Tariff Numbers.
- Classification of products with control classes and control groupings for legal control.
- Management of classification data from external data providers.

International Trade Compliance

- Control of statutory regulations for import and export.
- Managing of licenses in accordance with legal control for export and import processes.
- Managing and release of blocked legal control documents.
- Managing countries/regions under embargo.

Intrastat

- Managing Intrastat declarations and their master data.

Integration with SAP Global Trade Services

- Transfer of master and movement data from the S/4HANA cloud to your SAP Global Trade Services. Integration allows to use the GTS functionalities in your processes.

Integration with SAP Watch List Screening

- Integration allows to screen names and addresses in specific transactional documents during import and export processes.

2.5.5.1.1 International Trade Classification

Business Background

You use classification to manage commodity codes, Intrastat service codes, control classes, end use, and control groupings and their assignment to products. The Intrastat service codes are only relevant for Italy.

Key Features

The following table explains the key features available:

Key Feature	
Manage commodity codes	You can manage the commodity codes that you require for your international trade processes.
Classify products with commodity codes	You can find products to which no commodity code has yet been assigned, and assign a commodity code for a specific period to these products.
Reclassify products with commodity codes	You can find products to which a commodity code has been assigned, and assign a new commodity code for a specific period to these products.
Manage Content from Data Provider - Commodity Codes	You can activate data from external data providers.
Schedule Content Request to Data Provider -Commodity Codes	You can schedule regular requests to your external data providers to receive updated or new versions.

Manage Intrastat service codes	You can manage Intrastat service codes that you require for your Intrastat declarations.
Classify products with Intrastat service codes	You can find products to which no Intrastat service code has yet been assigned, and assign an Intrastat service code for a specific period to these products.
Reclassify products with Intrastat service codes	You can find products to which an Intrastat service code has been assigned, and assign a new Intrastat service code for a specific period to these products.
Manage Control Classes	You can manage control classes to classify products for your international trade processes. You can add a description to a control class and specify its validity.
Manage Control Groupings	You can manage control groupings to classify products for your international trade processes.
Classify Products with Legal Control	You can assign control classes and control groupings time-dependently to products that have not yet been classified for legal control.
Reclassify Products with Legal Control	You can re-assign another control class or control grouping time-dependently to products that have already been classified for legal control.
Manage Content from Data Provider - Control Classes	You can display, check, and activate content from external data providers.
Schedule Content Request to Data Provider - Control Classes	You can regularly schedule requests to your external data providers to receive updated and new versions.
Manage Customs Tariff Numbers	You can manage the Customs Tariff Numbers that you require for your international trade processes.
Classify Products - Customs Tariff Numbers	You can find products to which no Customs Tariff Number has yet been assigned, and assign a Customs Tariff Number for a specific period to these products.
Reclassify Products - Customs Tariff Numbers	You can find products to which a Customs Tariff Number has been assigned, and assign a new Customs Tariff Number for a specific period to these products.
Classify Products for End-Uses - Customs Tariff Numbers	You can assign scenario-specific customs tariff numbers time-dependently to an unclassified product in international trade through the usage of numbering specific end-uses.

Reclassify Products for End-Uses - Customs Tariff Numbers	You can assign scenario-specific customs tariff numbers time-dependently to a classified product in international trade through the usage of numbering specific end-uses.
Manage Content from Data Provider - Customs Tariff Numbers	You can display, check, and activate content from external data providers.
Schedule Content Request to Data Provider - Customs Tariff Numbers	You can regularly schedule requests to your external data providers to receive updated and new versions.
Display Classified Products - International Trade	You can display products which have been classified with a code number, like commodity codes, customs tariff numbers, customs tariff numbers with end uses, legal control relevant attributes or intrastat service codes.
Display International Trade Classification	You can display classification information for all active numbering schemes and legal regulations currently valid for the selected product.

2.5.5.1.2 International Trade Compliance

Business Background

You use International Trade Compliance to manage licenses and trade compliance documents.

Trade compliance checks are based on the following document types:

Document Type	Legal Control	Embargo	SAP Watch List Screening
Sales Orders	X	X	X
Sales Orders without Charge	X	X	X
Sales Contracts		X	X
Sales Scheduling Agreements	X	X	X
Sales Quotation		X	X
Outbound Deliveries	X	X	X
Inbound Deliveries	X	X	X
Purchase Orders	X	X	X
Stock Transfer Orders	X		

Document Type	Legal Control	Embargo	SAP Watch List Screening
Purchasing Scheduling Agreements	X	X	X
Purchasing Contracts		X	X
Purchase Requisitions	X	X	X
Trading Contracts	X	X	X

Key Features

The following table explains the key features available:

Key Feature	Use
Manage Licenses	You can manage licenses to comply with bans and restrictions against specific product /product groups for authorities.
Manage Documents with Trade Compliance	You can manage documents to display the status of legal controls, embargoes, and SAP Watch List Screening. You can display licenses that are assigned to the business transaction, and which classifications are present.
Analyze and Resolve Blocked Documents – Trade Compliance	You can use the analytical list page to graphically display blocked documents and analyze them. You can resolve legal control blocks of documents, if they are missing classification and/or licenses.
Manage Rules for Legal Control	You can manage legal control rules to determine blocklisting, allowlisting, or License terms in a specific order. You can define these rules yourself to consider their specific requirements or specific legal requirements
Display License Assignments - Trade Compliance	You can display assigned documents to licenses and overview open depreciation values and quantities.
Managing Countries/Regions under Embargo	You can manage countries/regions for which an embargo situation exists.
Schedule Recheck Documents - Trade Compliance	You can mass recheck for blocked trade compliance documents to regularly check and release blocked trade compliance documents via the job scheduling framework.

2.5.5.1.3 Intrastat

Business Background

You use Intrastat declarations to record goods movements that cross national borders between member states of the European Union. In Italy, services must be declared in addition.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage providers of information	The statistics authority of your country requires that you, as a company, provide Intrastat-relevant data to the authority in the form of Intrastat declarations. To be able to create Intrastat declarations, you have to enter the provider-of-information data of your company.
Manage Intrastat declarations	You can enter the required statistical data of a month in Intrastat declarations for the following transactions: • Receipts to your company from other member states of the European Union • Dispatches from your company to other member states of the European Union
Select dispatches and customer returns for Intrastat declarations	You can select dispatches and customer returns based on billing documents to generate data for Intrastat declarations.
Select receipts and returns to supplier for Intrastat declarations	You can select receipts and returns to supplier based on purchase orders and intercompany billing documents to generate data for Intrastat declarations.

You can create Intrastat declarations for the following countries:

- `AT` (Austria)
- `BE` (Belgium)
- `BG` (Bulgaria)
- `CY` (Cyprus)
- `CZ` (Czechia)
- `DE` (Germany)
- `DK` (Denmark)
- `EE` (Estonia)
- `ES` (Spain)
- `FI` (Finland)

- FR (France)
- GB (United Kingdom)
- GR (Greece)
- HR (Croatia)
- HU (Hungary)
- IE (Ireland)
- IT (Italy)
- LT (Lithuania)
- LU (Luxembourg)
- LV (Latvia)
- NL (The Netherlands)
- PL (Poland)
- PT (Portugal)
- RO (Romania)
- SE (Sweden)
- SI (Slovenia)
- SK (Slovakia)

2.5.5.1.4 Integration with SAP Global Trade Services

Business Background

SAP S/4HANA supports the integration with SAP Global Trade Services to offer additional processes for your international supply chain.

2.5.5.1.5 Integration with SAP Watch List Screening

Business Background

SAP S/4HANA Cloud supports the integration with SAP Watch List Screening (needs to be licensed separately).

Key Features

The following table explains the key features available:

Key Feature	Use
Schedule Postprocessing with Watch List Screening	You can schedule the postprocessing of Watch List Screening relevant documents.

Related Information

International Trade Compliance [page 49]

2.6 Human Resources

2.6.1 Core HR and Time Recording

2.6.1.1 Organizational Management

Business Background

Organizational Management allows you to build, maintain, and reorganize organizational structures and requirements for qualifications of the workforce.

Key Features

The following table explains the key features available:

Key Feature	Use
Integration of Business Partner	You can use this function to do the business partner assignments.

Key Feature	Use
Organizational Plan Mode	The Organizational Management component includes various user group- specific modes and views with which to edit organizational plans: • The Organization and Staffing view provides an intuitive interface for creating and editing organizational plans • The General Structures view allows you to edit organizational plans with any structure including object types which, you have defined yourself (teams, for example). • The Matrix view is for creating and editing matrix structures.
Expert Mode	• Expert mode allows you to edit the characteristics of various objects and their relationships via infotypes • Expert mode allows you to edit the characteristics of various objects and their relationships via infotypes
Working with Screen Areas	You use this user interface in the Organization and Staffing or Organization and Staffing (Workflow) view to create, display, and edit organizational plans.
Editing the Organizational Structure	You can create, display, or change the organizational structure using the Organization and Staffing and the Organization and Staffing (Workflow) views. You can also assign characteristics to the organizational units.
General structures	You can use this function to create, edit, and display structures.

2.6.2 Timesheet

Business Background

Timesheet enables you to record and manage time data effectively. It allows you to enter employee working time and absences. You can also use the timesheet to approve or reject time entries.

Key Features

The following table explains the key features available:

Key Feature	Use
Create and update time entries	You can log in time spent on different tasks (projects or non-project related) using this feature.

Key Feature	Use
Time Management for Concurrent Employment	You can use this feature to record time for a chosen personnel assignment even if you are concurrently employed.
Approve, Review or Reject Time entries	You as a manager can approve, review or reject time entries of your employees.

2.6.3 Integration with External HR System

Business Background

SAP S/4HANA supports the integration with an external HR system (currently SAP SuccessFactors Employee Central) to enable you to replicate employee, organizational, and cost center data.

Key Features

When an external HR system (for example, SAP SuccessFactors Employee Central) is integrated and supports the below named features, SAP S/4HANA enables the external HR system to provide the following key features:

Key Feature	Use
Replicating Employee Master Data from Employee Central to SAP S/4HANA	You can replicate employee master data from the SAP SuccessFactors Employee Central to SAP S/4HANA system.
Replicating Organizational Data from Employee Central to SAP S/4HANA	You can replicate organizational data from the SAP SuccessFactors Employee Central to SAP S/4HANA system.
Replicating Cost Centers from SAP S/4HANA to Employee Central	You can replicate cost center data from the SAP S/4HANA system to SAP SuccessFactors Employee Central.
Contingent Worker Data Integration	You can integrate contingent worker data like basic data and contact details from SAP SuccessFactors Employee Central to SAP S/4HANA system.
Availability	You can now view the work schedule of an employee thus enabling you to access the up-to-date time information like your target hours, absences, holidays, and so on for time recording.
Search and Display of employees replicated using Employee Central	You can now search for employees and contingent workers replicated via SuccessFactors Employee Central. You can also view the Employee's Basic details, Contact data, Organizational Data and Service Cost level data.

2.7 Manufacturing

2.7.1 Just-In-Time (JIT) Processing

2.7.1.1 Next Generation Just-In-Time (JIT) Supply to Production

Business Background

Next generation just-in-time (JIT) supply to production enables you to replenish materials required for manufacturing and assembling from a different internal location or from an external supplier in the required quantity and at the required time. JIT calls are used as replenishment requests and the fulfilment by stock transfer is done with reference to these.

Key Features

The following table explains the key features/applications available:

Key Feature	Use
Managing JIT control cycles	• Define the relationship between the destination or demand source (such as the production supply area or an intermediate storage) and the supply source (such as a warehouse) for a material in the control cycle. • Create, filter, view or modify control cycles for JIT supply to production. • Map control cycles to communication group for external replenishment from a supplier, a new control cycle category for sequenced JIT calls, and navigate to application logs. • Integration with EWM, safety time, mass processing of control cycles, external replenishment indicator, offset time for sequenced JIT calls, demand and consumption driven planning procedures, bill of materials to support multiple component materials in component group materials, mass processing of JIT control cycles, and improved selection filters. • More information on supplier, new JIT calls, and in house production strategy. • Cross application navigation to the *Manage JIT Calls* application to update replenishment lead time for all the changeable JIT calls. This is possible while editing the replenishment time. • Perform demand driven replenishment planning for primary and secondary control cycles considering planning elements and planning parameters of control cycles using primary and secondary storage bins as source.The secondary control cycle can be for demand driven or consumption-based planning procedure. The primary control cycle can be of any planning procedure. • Update or change production supply area (PSA) information of control cycles. While editing the production supply area of a control cycle that has active JIT calls, you can edit fields for the control cycle that is newly created. The fields are filled with default values derived from the original control cycle and the old control cycle is set to locked status. The newly copied control cycle is set to released status at the time and date in the future given in the old control cycle information while copying. • Migrate control cycle data using the migration tool.

Key Feature	Use
Requesting replenishment for JIT control cycles	• Request replenishment by selecting a JIT control cycle. The JIT control cycle provides the request data, such as the production supply area as destination, the warehouse or external supplier as source, material, requested quantity and demand date and time. The replenishment requests can be reviewed and the requested quantity and demand date and time can be edited before sending it to create JIT calls. • Supports external replenishment, missing and available stock at source, JIT call priority with new customizing, enhanced demand date and time and input method. • Provides information on open and active JIT calls and warehouse source. • View number of JIT calls raised or created. If only one JIT call is raised or created, the respective JIT call number displays on the user interface. In case of more than one JIT call, the number of created JIT calls is visible.
Transferring warehouse stock for JIT calls	• This application is for transferring stock from Inventory Managed (IM) source to destination production supply area. • Fulfil the supply by posting stock transfers to JIT calls filtered by various criteria. • A transfer status is indicated and a transfer quantity is proposed based on the available stock at the warehouse. The stock transfer could be executed in one or two steps, defined by the replenishment strategy of the JIT control cycle.
Scheduling creation of JIT calls	• Schedule automatic creation of JIT calls using background job. • Evaluation of errors is easier as errors are logged.
Changing status of JIT control cycles	• Schedule jobs for changing the lifecycle status of control cycles.
Managing JIT calls	• View, edit, and cancel Just-In-Time (JIT) calls that are either created manually or through automatic planning. • Change the priority of JIT calls, add supply date and time, edit reference texts at three levels, update requested quantity, monitor status of JIT calls, and navigate to view the application logs. • Mass change option to change the replenishment lead time for all changeable JIT calls, without changing the control cycle master data. • Supports external replenishment from external suppliers using SAP transportation management and logistics execution for inbound goods processing.You can view *Advanced Shipping Information* (ASN), which is considered as a supply element while calculating stock.

Key Feature	Use
Monitoring JIT calls	**Component Materials**: • Get an overview of all JIT calls at a component level in your responsibility area. • Navigate to view the application logs. **Component Group Materials**: • Get an overview of JIT calls, at a component group level in your responsibility area.
Planning supply to production	• Plan for the replenishment of materials that are required in a production supply area. • Identify materials that are in short supply by checking the missing quantity values displayed for control cycles and can either create JIT call manually or triggered automatic planning and by scheduling background jobs. • Create proposals to simulate the stock situation. The JIT calls are created based on demands such as planned or production orders and based on safety stocks for consumption driven scenarios. • Perform demand driven replenishment planning for primary and secondary control cycles considering planning elements and planning parameters of control cycles using primary and secondary storage bins as source.The secondary control cycle can be for demand driven or consumption-based planning procedure. The primary control cycle can be of any planning procedure. • Supports external replenishment from external suppliers using SAP transportation management and logistics execution for inbound goods processing.You can view *Advanced Shipping Information* (ASN), which is considered as a supply element while calculating stock. • Calculate the physical stock of a component before the production backflush. Rather determine the stock at the storage during the transient state. To achieve this, you need to sequence the planned orders or production orders based on the confirmation date and time at the factory area and map the current position of the planned orders or production orders in the sequence with the work centres. In this scenario, the planned orders or production orders that crosses the particular work centre is considered as consumed physically for the particular work centre.
Managing communication group	• Create communication group that is a combination of supplier and subsequent message partners with whom the supplier is working with for supplying the materials to production line requirements. These communication groups are assigned to control cycles. The application *Manage Communication Group* is relevant for external replenishments. • Migrate communication group data using the migration tool.

Key Feature	Use
Managing JIS calls and reordering	• Manage just in sequence (JIS) calls and reorder the component materials for a same or different production supply area (PSA). A JIS call is created based on the planned order for a vehicle or as a trigger as soon as a planned order is generated. • The application *Manage JIS Calls and Reorder* provides sequence and vehicle information, for example, sequence number, vehicle planned order, and so on. • Supports external replenishment from external suppliers using SAP transportation management and logistics execution for inbound goods processing.You can view *Advanced Shipping Information* (ASN), which is considered as a supply element while calculating stock.
Posting goods receipt	• Generate and post receipts for the goods that are received for external replenishment from a supplier to an inventory managed (IM) managed destination production supply area (PSA), by updating the stock at PSA along with schedule agreement and schedule line update of goods receipt.
Display application logs	• An application to display logs • Check if any errors occurred • View details of a job run • Search and display message texts and details
Monitoring JIS Calls	• View a list of JIS calls based on a combination of production supply area, component group material, and JIS call status. • Navigate to the *Manage JIS Calls and Reorder* application to view the alerts in case of deviations between the supply date and the current system date. • Flexibility to view JIS calls details as bar chart, donut chart, or line chart. • Visual filter to quickly visualize the JIS calls. By default, compact filter is enabled. Filters are based on production supply area, JIS call status, supply date, and internal processing status.
Overview of JIT Supply to Production	• Overview of JIT calls and master data based on the scheduled background jobs such as the control cycle job status and JIT call creation. Some of the job statuses are information, error, and success. • Customize own card with options such as increase the card size and move. • Navigate to the *Manage JIT Calls* application with the relevant filters applied. • Filters are enabled only for those cards wherein relevant data is available or valid. • Flexibility to select cards that you want to be visible within the page, using the option, *Manage Cards*.

2.7.1.2 Just-In-Time (JIT) Supply to Customer

Business Background

Just-in-Time (JIT) processing is a common practice in manufacturing industries for efficient demand-driven production and logistics across supply chains. Just-In-Time Supply to Customer covers JIT processes from the perspective of a supplier.

The JIT process is based on sales scheduling agreements that cover the commercial and planning aspects of the business relationship between supplier and customer. Based on their production and material requirements planning, the customer sends JIT calls to the supplier to request a delivery of goods.

Key Features

The following table explains the key features available:

Key Feature	Use
Master data for JIT processing	You define various master data specifically for processing JIT calls from your customers, enabling you to manage customer JIT calls with respect to business requirements.
Managing sales scheduling agreements for JIT processing	You maintain sales scheduling agreements for JIT processing for the materials requested by customers. It enables you to specify terms and conditions with regards to sales, delivery and billing, and to create delivery schedules received from your customer as forecasts to plan production and procurement.
Managing customer JIT calls	You create a customer JIT call after receiving the JIT call from your customer. The customer JIT call is created either as summarized JIT call or sequenced JIT call. In case the customer sends a JIT call update or cancellation, you can modify or cancel the customer JIT call. For a sequenced JIT call, the customer could reorder components and you can create an additional sequenced JIT call indicated as reorder. For customers requesting highly configurable assemblies or sets using a list of components, the corresponding JIT call components requested can be grouped to component groups using business rules, managed and deployed using SAP Cloud Platform Business Rules. Based on how you define the packing of component groups for sequenced JIT calls, you can group JIT calls to be packed together and assign it to slots within the packaging material, based on the sequence of withdrawal at the customer.
Managing production for customer JIT calls	In case production should be executed based on customer JIT calls, the feature enables you to release customer JIT calls to production and confirm production thereafter.

Key Feature	Use
Process outbound deliveries for customer JIT calls	You can create outbound deliveries for customer JIT calls and process these further from picking to goods issue posting. When notifying the shipping to the customer, you can refer to the customer JIT calls also.
Analysis and monitoring	You can monitor the receipt and further progress of customer JIT calls. For that, the progress is reflected by status updates as the JIT call is processed, such as when confirming production or creating outbound deliveries. You could also analyze the demand provided by customers for deviations as compared to the received JIT calls. The availability of stock for materials requested as components in customer JIT calls can be analyzed to detect potential shortfalls in supply to your customers.
Managing delivery confirmations to customer JIT calls	You can receive JIT delivery confirmations from your customers, referring to customer JIT calls already delivered. You can monitor and release these for further processing towards billing or self-billing.
Scheduling custom actions	You can schedule in advance the execution of custom actions for customer JIT calls.

2.7.2 Production Engineering

2.7.2.1 Production BOM Management

Business Background

During the product engineering phase, you design and develop products. You design new products or product lines to take advantage of current process technology and to improve quality and reliability. Or, you have to change an existing product due to changing market or customer requirements. The result of this product phase is drawings and a list of all the parts required to produce the product. This list is the bill of material.

Key Features

The following features are available:

Key Feature	Use
Manage bills of material	You can create a complete, formally structured list of the components that make up a product or assembly. A bill of material contains essential master data for integrated materials management and production control. In the design department, a new product is designed so that it is suitable for production and for its intended purpose. The result of this product phase is drawings and a list of all the parts required to produce the product. This list is the bill of material which is the basis for the production process (in discrete manufacturing, repetitive manufacturing, and in the process industry).
Assign BOMs to plants	You can extend the area of validity of a BOM that you defined when you first created it. This means, for example, that you can assign the same BOM to a material in different plants - avoiding data redundancy and multiple data entry.
Monitor multilevel BOM assignment	You can use a reporting function that determines all components (assemblies and individual parts) in a product and displays them per low-level code.
Find BOM for component	You can use a reporting function that determines where an object (for example, material) is used and the quantity that is required. This is necessary, for example, if objects are used in more than one context. You can use this information to: • Determine requirements for a specific material. • Select all products that are affected by a change to an individual part. • Find assemblies that will be delayed if there is a delay in the delivery of a raw material, for example. • Calculate the effect on the cost of a product if the price of a raw material is increased.

2.7.2.2 Master Recipe/Routing Management

Business Background

During the process engineering phase, you design and continuously improve manufacturing equipment and production facilities. This process enables you to model the capabilities of the manufacturing equipment and to monitor its performance.

Key Features

The following features are available:

Key Features	Use
Manage the objects and persons involved in the production process • Discrete manufacturing: Model work centers • Process industry: Model resources	You use work centers/resources to represent machines, production lines, employees, or groups of employees, for example. Together with the bills of material and routings/master recipes, work centers/resources belong to the most important master data in the production planning and control system and are used for scheduling, costing, capacity planning, and for simplifying operation maintenance.
Group work centers for capacity evaluation	You can group work centers based on the same line or on the alternate work centers, to carry out the same work. This gives the capability to assess aggregated capacities across work centers and enables easy decision making.
Model the production process • Discrete manufacturing: Model routings • Process industry: Model master recipes	A routing/master recipe is a description of the operations/process steps that have to be carried out and the order in which they have to be carried out to produce a material. In addition, a routing/master recipe contains details about the work centers/resources at which the operations/process steps are carried out and the BOM components that are required. In discrete manufacturing, the routing is used as the basis for creating production orders and in the process industry, the master recipe is used as the basis for creating process orders.
Model production versions	The production version determines the production techniques according to which a material is to be manufactured. A material may have several bills of material (BOMs) that determine the components used in its production. The production process can also be described in various routings/master recipes. You define which BOM and which routing/master recipe is to be used for production in the production version that you assign to a material.
Model the exchange of data relevant to production	You have to provide the shop floor with up-to-date information to keep your production process running as smoothly and efficiently as possible. To this end, you can define in detail how the production process is to be executed and the data you want to collect during production. You can compare this data with existing data and continually make improvements to the process.

2.7.3 Production Planning

2.7.3.1 Material Requirements Planning

Business Background

Material requirements planning enables you to ensure the availability of materials and perform basic production planning. It is typically performed by the MRP controller who monitors the material shortage situation and solves any issues on time. Another main task is to ensure that sufficient supplies have been planned to cover requirements — whether from sales orders, stock transfer orders, or from production, for example. The goal is to ensure that both customer and production demand are fulfilled on time and to avoid any disruptions due to missing parts.

Key Features

The following features are available:

Key Feature	Use
Manage planned independent requirements	You can create and change planned independent requirements.
Perform material requirements planning	You can automate the planning of the procurement process. You can schedule your MRP runs to be executed automatically on a regular basis. The main aim of the planning run is to guarantee material availability to avoid delays in order fulfillment. To do this, the system checks the availability of each material in the planning run and creates purchase requisitions or planned orders if it detects shortages.
Monitor and manage supply and demand	You can monitor and adjust the current supply and demand situation for your area of responsibility using a selection of tools. You have system support in detecting material shortages, uncovered requirements as well as any issues regarding process orders or production orders. You are provided with further automated support for solving issues to avoid delays or disruptions due to missing items. Tools are also available for communicating with your supplier if solving the issues requires changing a purchase order or stock transport order. The stock/requirements list displays all supply and demand elements for all materials with a net requirement segment or individual segments in the form of a table and enables you to gain a quick overview of the stock/requirements situation for the material. You can also branch into the editing function for the MRP elements for this material. Planned orders are created automatically during a planning run. However, you can also create new planned orders or change existing ones manually to optimize the replenishment situation.

Key Feature	Use

Convert planned orders	You can convert planned orders into production orders or process orders. You can convert the planned orders manually or you can create a job to automate the conversion process.
	
	Planned orders are internal planning elements that are only used for planning purposes and do not trigger any procurement (with the exception of repetitive manufacturing). The system only triggers procurement once the planned orders are converted into fixed receipt elements:
	
	• Discrete Manufacturing
	  ○ You can convert planned orders for materials that are to be produced in-house to production orders. You can convert your planned orders manually or automatically using an order conversion run. The material components required for production are contained as items in the planned order and are copied to the production order. The dependent requirements for the components are converted into reservations. With the conversion to production orders, the responsibility is passed on from the MRP controller to the production supervisor.
	• Process Industry
	  ○ In this case, you convert planned orders into process orders. Again, you can convert your planned orders manually or automatically using an order conversion run. The material to be produced, the order quantity, and the order dates are copied from the planned order to the process order and the dependent requirements for the components are converted into reservations. With the conversion to process orders, the responsibility is passed on from the MRP controller to the production supervisor.
	• Repetitive Manufacturing
	  ○ In repetitive manufacturing, planned orders can be used to trigger production. In this case, the planned orders do not have to be converted into production or process orders.
	
	You convert planned orders for materials that are to be purchased externally into purchase requisitions. Purchase requisitions created automatically during the MRP run can be locked first for checking. A subsequent handover passes on the responsibility of these purchase requisitions to the purchasing department for converting them into purchase orders. If you are a production planner responsible for external procurement and if you work with Production Planning and Detailed Scheduling (PP/DS), you can optimize the shipment of the materials to best utilize the capacity of your means of transport (such as a truck).

2.7.3.2 Production Scheduling

Business Background

Material Requirements Planning (MRP) addresses the coverage of demand by supply elements (for example, inhouse production orders) without considering the available capacity. Capacity planning supports the MRP

planner in changing the production plan in such a way that the capacity constraints are considered while keeping the demands in time and quantity in mind.

Key Features

The following table explains the key features available:

Key Feature	Use
Maintain Capacity	You can review when and how much capacity is available for a work center. This is called the capacity definition. You can manage this definition for instance, by reducing the work time or by including additional work time.
Evaluate Capacity	You can review the capacity load on your work centers. You can compare the available and required capacities, thereby identifying the issues that needs to be resolved.
Create Detailed Plans	You can filter and select the orders to be planned by using different search criteria. You can decide where (the source) and when (the dates) the orders need to be planned.

2.7.3.3 Demand-Driven Replenishment

Business Background

Demand-Driven Replenishment enables you to plan and manage supply chains based on customer demand, rather than through traditional MRP procedures. You can create the basis for a reliable material flow by defining buffers at strategically important points along a supply chain and by regularly adjusting the buffers' limits.

Key Features

The following table explains the key features available:

Key Feature	Use
Analyze and classify products	You can analyze and classify your products based on certain criteria to identify products which can act as decoupling points. You can automate the classification process by scheduling classification runs to be executed on a regular basis.
Select products relevant to Demand-Driven Replenishment	You can define which products are relevant to Demand-Driven Replenishment using classification information.
Generate buffer level proposals	You can generate buffer (stock) level proposals for your products that are relevant to demand-driven replenishment (DD-relevant products). You can automate the generation of buffer level proposals by scheduling runs to be executed on a regular basis.
Manage buffer levels	You can manage the buffer levels, and in turn, the safety stock, reorder point, and maximum stock for your products based on the buffer level proposals.
Monitor replenishment planning	You can monitor the planning status of buffers using their planning priority.
Monitor replenishment execution	You can monitor the execution status of buffers using their on-hand stock status.

2.7.3.4 Predictive Material and Resource Planning

Business Background

Predictive material and resource planning (pMRP) enables production planners to identify capacity issues related to demand-driven materials and to solve them early in the planning process. They work with simulations based on simplified data to detect the issues and to simulate counter measures.

As a result of processing the simulation, planners are prepared to take decisions on changed conditions, for example with regard to requirement planning.

Key Features

The following table explains the key features available:

Key Feature	Use
Schedule the creation of pMRP simulations	You can create simplified planning data and use them as reference data in a simulation.
Process pMRP simulations	The simulation provides a demand plan view where you can simulate changes to the demand quantities and a capacity plan view where you can simulate changes to the available capacity. You can check the impact of these simulated changes and display a summary.

2.7.4 Production Operations

2.7.4.1 Production Control

Business Background

This process enables you to manage and regulate the manufacturing process. It is typically performed by the production supervisor who is responsible for dispatching production operations to individual machines if a work center/resource has several alternative machines and for assigning shop floor specialists to operations or machines. The production supervisor also decides on measures to mitigate machine breakdowns or missing components, for example.

Key Features

The following features are available:

Key Feature	Use
Monitoring and adjusting the production worklist	You can change production orders or process orders, perform scheduling, and check component availability.

Key Feature	Use
Releasing production orders/process orders	You have to release the production/process order before it can be processed. You can use the time period between creating and releasing an order, for example, to carry out company checks and preparations. You can instruct the system to perform a component availability check at order release. You can release the production/process order at header level releasing all operations. Or, you can release single operations. You can also perform a mass release. Furthermore, you can schedule an order release run that instructs the system to release all your production/process orders periodically. Once the orders are released, you can execute confirmations, print shop floor papers, and execute goods movements, for example.
Monitoring production execution	You have various options for monitoring production progress. • Order Progress Report. This report shows you which documents, MRP elements, stocks, and deliveries exist for products and their components that have been ordered by a customer. The order progress report gives you a quick overview of the status of production and procurement, statements about the adherence to delivery dates or delays and this information can be displayed for more than one sales order or a WBS element. From the report, you can navigate to the individual procurement elements, the stock/requirements list, or the stock overview, for example. • Order Information System This report provides you with reporting functions for production orders, planned orders, and process orders. You can view all the orders in the system, including the orders with deletion flags or deletion indicators. For production and process orders, you can display the order headers, items, documented goods movements, operations, components, the production list, and confirmations, for example. From the report, you also have various navigation options.

Key Feature	Use
Executing production completion	To complete the production process, you can set the status of the production/process order to technically complete and you can complete the order settlement. When an order is settled, the actual costs incurred for the order are settled to one or more receiver cost-objects (for example, to the account for the material produced or to a sales order). Technical completion means ending a production order from a logistical viewpoint. The following actions are executed for orders with this status: • The order is no longer relevant for MRP • Reservations are deleted • Capacity requirements are deleted • Purchase requisitions for external operations or non-stock materials are deleted • The order and its operations are set to *Technically Completed* An order with this status can no longer be changed. You can, however, still make postings for the order such as a material withdrawal or a confirmation. After closing the order, no further updates are possible.
Model the exchange of data relevant to production	You have to provide the shop floor with up-to-date information to keep your production process running as smoothly and efficiently as possible. To this end, you can define in detail how the production process is to be executed and the data you want to collect during production. You can compare this data with existing data and continually make improvements to the process.

2.7.4.2 Production Execution

Business Background

This capability enables you to make all the necessary preparations required for production, to coordinate the exchange of data relevant to production, and to document production progress. It is typically performed by the production operator and includes the following tasks:

- Material staging before production starts.
- Reporting goods withdrawals.
- Processing time tickets for a production order or a process order.
- Entering the goods receipt information for the order on completion of the product.
- Executing planned manual production steps.
- Documenting and logging production information.

Key Features

The following features are available:

Key Feature	Use
Monitoring released production orders/ process orders	You can display the released production/process orders. This means that you have access to all the information required to produce the product including dates, times, and quantities, for example.
Picking	You can use the picking function to determine which components have not yet been issued from stock for an order and then you can perform the goods issue.
Confirming production	You can confirm the production progress for production and process orders. A confirmation documents the processing status of orders and triggers the following business operations, for example: • Updates order data (quantities, activities, dates, status, for example) • Backflushes material components • Posts goods receipts • Updates costs You can cancel or partially cancel confirmations. You can reprocess goods movements.
Exchange of data relevant to production	Depending on the production process, various manual steps have to be processed during production. You can display manual production steps and execute them. Such production steps include: • Instructions on how to carry out production steps or guidelines, such as rules for handling hazardous materials or substances • Recording of actual process data • Reporting of entered and calculated values • Performing calculations • Creating comments
Recording and logging of production information	You can document or log production information which requires a form that excludes manipulation. This is particularly relevant for regulated industries.
Exchange of data with an industrial (process) control system or other external system	Using Manufacturing Execution Connect (classic) you can transfer control data from the manufacturing order to process control. For more information, see Manufacturing Execution Connect (Classic) [page 73].

2.7.4.2.1 Manufacturing Execution Connect (Classic)

Business Background

Manufacturing Execution Connect (classic) provides features for exchanging data with an industrial (process) control system or other external system. You can use Manufacturing Execution Connect (classic) as a part of a flexible transition to SAP S/4HANA.

Key Features

The following table explains the key features available:

Key Feature	Use
Process messages	When a manufacturing order is carried out, actual process data is needed that documents the process and is available for further processing in the system and in external process control systems. You can use this feature to send actual data from process control to predefined message destinations. • The usage of process messages is possible in conjunction with linking process control systems or other external systems using the PI-PCS interface. This also applies to the maintenance of the corresponding process instruction content (characteristics-based process instructions and XStep-based process instructions). The following destination types are supported: ○ Download to external system, initiated by SAP system ○ Download to external system, initiated by external system • The usage of process messages in conjunction with browser-based PI sheets and work instructions is part of the compatibility scope (see Production Execution [page 661]).

Key Feature	Use
Control recipes (process industry) Control instructions (discrete manufacturing)	Using control recipes/instructions, you transfer control data from the manufacturing order to process control. The information contained in a control recipe/instruction and the destination to which it is sent are user-defined. • The usage of control recipes/instructions is possible in conjunction with linking process control systems or other external systems using the PI-PCS interface. This also applies to the maintenance of the corresponding process instruction content (characteristics-based process instructions and XStep-based process instructions). The following destination types are supported: ○ Download to external system, initiated by SAP system ○ Download to external system, initiated by external system • The usage of control recipes/instructions in conjunction with browser-based PI sheets and work instructions is part of the compatibility scope (see Production Execution [page 661]).
Material identification/reconciliation (process industry)	You can use material identification to identify and verify the ingredients at the production line. You can use material reconciliation to analyze and verify ingredients at the end of a production process. It enables you to compare the material quantity that actually flowed in with the planned quantity or the quantity of the material produced. You can also display other information about the ingredients using the movement types. Reconciliation of the ingredients can ensure that there are no discrepancies outside of the valid range in the relationship between the input and yield. • The usage of material identification/reconciliation is possible in conjunction with linking process control systems or other external systems using the PI-PCS interface. The following destination types are supported: ○ Download to external system, initiated by SAP system ○ Download to external system, initiated by external system • The usage of material identification/reconciliation in conjunction with browser-based PI sheets and work instructions is part of the compatibility scope (see Production Execution [page 661]).

2.7.4.3 Repetitive Manufacturing

Business Background

You can use Repetitive Manufacturing for planning and controlling your production in repetitive manufacturing and flow manufacturing environments.

In repetitive manufacturing, you can plan and monitor the material flow in a much higher level of detail than that at which you collect and analyze costs. You use planned orders to model, plan, and trigger material flow

and product cost collectors to collect the costs. Planned orders are simple and easy to manage with low overhead which you can use to model small increments of the production quantity. The product cost collectors collect the costs of the complete quantity produced during an accounting period. All deviations are aggregated.

On the other hand, in discrete manufacturing, you plan and manage both the material flow and costs on the same level of detail in the production order, for example. Therefore, if you want to collect scrap and other deviations in detail, you are recommended to use discrete manufacturing.

You can use repetitive manufacturing in the following scenarios:

- Make-to-stock production
  Production is controlled without a direct reference to the sales order. Run schedule quantities determine the dates and quantities. Run schedule quantities are planned orders of the type PE that do not have to be released and that you do not have to convert into production or process orders to be able to carry out production. The requirements are generated by demand management, for example. Sales order quantities are delivered from stock and consume the planned independent requirement quantities in demand management, according to the planning strategy you select. A product cost collector is used to collect actual data and to settle costs.
- Make-to-order production
  The system creates one or several planned orders which directly reference the sales order item. The material is then manufactured on the basis of these planned orders. That is, production is triggered by the receipt of the sales orders. For component materials that are relevant to repetitive manufacturing, you use the product cost collector of the component to collect costs. On finished item level, you either use valuated or non-valuated material: Costs are collected by the sales order if you use non-valuated material and by the product cost collector if the material is valuated.

The business process includes analysis, material requirements planning, and the evaluation of the planning results. You can carry out extensive planning steps such as the MRP run in the background or manually.

Key Features

The following features are available:

Key Features	Use
Planning table	Your main planning tool in repetitive manufacturing is the planning table. It is an operative planning tool that you can use to plan the production quantities. In the planning run, the system assigns the run schedule quantities to the correct line as defined in the production version. In the planning table, you can change the assignment of run schedule quantities to production lines/versions manually. In this type of manufacturing, you plan and control your production using the planning table based on periods and quantities. You can check production quantities, monitor the available capacity of the production lines and check up on the availability situation of the products produced on each line. In the planning table, you can enter and change production quantities and you can assign and reassign quantities to alternative production lines. The planning table allows you to schedule planned orders to the corresponding production lines as follows: • You can change the planned orders/run schedule quantities created in MRP manually (such as quantity/date changes), or you can create additional orders. • You can assign unassigned production quantities to the production lines or reassign production quantities to different production lines. • You have the option of using production or process orders to perform planning tasks. A prerequisite for this is that you have created a valid production version for the material. • Because planning is often carried out on the basis of shifts, the planning table also has functions for distributing production quantities across shifts.
Staging materials using the pull list	You can use the pull list to control the in-house flow of material for supplying production with materials. A prerequisite for this is that the components required for production are already available (either produced in-house or procured externally) and must only be brought from their current storage location to the production storage location. The pull list checks the stock situation at the production storage location and calculates the quantities of missing parts. You can create replenishment elements for these missing parts. You can stage the components by direct stock transfer or stock transfer reservation. You can also trigger replenishment by setting a kanban to empty or by creating transfer requirements in Warehouse Management.

Key Features	Use
Confirming production for repetitive manufacturing	Separate tools are available for recording work progress in a repetitive manufacturing environment. In accordance with the requirements of this type of production, the confirmation process is very lean. For example, you have the option of deferring the entry of all actual data from production until the receipt of the finished part is recorded by a goods receipt confirmation. In the case of make-to-stock repetitive manufacturing, you also have the option of posting a reporting point confirmation at defined operations to record the stock of semifinished products in production, for example. You can couple the following processes in a goods receipt confirmation: • Posting of goods receipts for finished products • Posting of goods issues for the components (backflushing) • Reduction of planned orders • Posting of production costs to the product cost collector • Updating of statistics for analytical purposes You can also cancel incorrect confirmations and reprocess goods movements.
Analyze the product cost collector	You can analyze the costs per period. This means that you collect costs in a cost object over a long period of time and can analyze the credits and debits for certain periods.
Perform evaluations/reporting	You can create the following evaluations: • Reporting point overview You are provided with a statistical overview of all the reporting points of a production version. • Backflushing documents Documents are saved in the system for all backflushes. You can list and print these documents according to various selection criteria. • Updating planned quantities • Call cost reports in Cost Object Controlling

2.7.4.4 Kanban

Business Background

Kanban is a procedure for controlling production and material flow based on physical material stock in production. Material that is required on a regular basis is kept available in small quantities in production. With kanban, the replenishment or production of a material is only triggered when a certain quantity of the material has been consumed. This replenishment is triggered directly by production using previously maintained master data. Entries in the system are reduced to a minimum; to the input of a bar code, for example. All other actions are carried out automatically in the background.

With kanban, the production process is designed to control itself and the manual posting effort is kept to a minimum. Thus, you can achieve shorter lead times and reductions in stock levels.

With kanban, for example, the signal for material replenishment is triggered by the work center that requires the material (the consumer or the demand source). This signal can simply be a card that the demand sources

sends to the work center that produces the material (producer or supply source). This card describes the required material, quantity, and information on where it is to be delivered. It is these cards, which are known as kanbans in Japanese, that have given this type of production its name. On receipt of the material, the demand source can post the goods receipt simply by entering or scanning a bar code.

Compared to the basic kanban process that only uses boxes and cards to trigger material replenishment, this automated solution offers the following advantages:

- Goods movements are posted automatically meaning that inventory information is always up to date.
- Your supply sources are informed faster about the requirements situation at the demand source.
- The system collects data about the kanban cycle times that you can use to improve the process.

Key Features

The following features are available:

Key Feature	Use
Control cycle maintenance	You define the relationship between the demand source (such as a production line in production) and the supply source (such as an external supplier or warehouse) in the control cycle. The control cycle contains the following control data for kanban production: • Kanban circulation, that is, the number of kanbans that circulate between the supply source and demand source and the material quantity per kanban. • Basic data required for the automatic kanban calculation in the control cycle, if necessary. • Replenishment strategy such as in-house production, external source, or stock transfer. • Printing kanbans, if necessary. • Delivery address, if necessary. • Process control (such as the indicator for separate goods receipt, status sequence key, indicator for the logic to trigger the replenishment for one-card kanban, packing instructions, and production call profiles).

Key Feature	Use
Kanban status change (Confirmation)	You can control the production process by setting your kanbans to the appropriate status. You mainly use the statuses empty and full which are mandatory statuses. When a material in a kanban has been used up, you set the kanban status to empty which automatically triggers the replenishment process. The source of supply (producer, supplier) receives the signal to fill up the kanban. When you receive the full kanban back at the demand source (consumer), you set the kanban status to full which triggers the goods receipt posting for the material. You can work in a kanban environment quite efficiently using these two statuses. You can perform the status changes using bar codes and bar code scanners. When you scan the bar code, the required data is sent from the demand source to the supply source. If you require additional information for special cases, the following (optional) statuses are available: • Waiting: Indicates that although the material has been consumed, the supply source is not yet to replenish it. You also use this status if a new kanban has been created. • In process: Indicates that the requested material is currently being produced by the supply source. • In transit: Indicates that the material is currently on its way from the supply source to the demand source. • In use: Indicates that the material is currently being withdrawn by the demand source. • Error: Assigned by the system. Indicates that a desired status could not be set successfully. You only use the first four additional statuses if you work with the kanban board. Here, you can use them to record work progress.
Monitoring with the kanban board	You can use the kanban board to monitor production progress. Irrespective of whether you are the supply source or the demand source, the kanban board provides you with a detailed overview of the kanbans in circulation. You can also use the kanban board to change the status of the kanbans. The following additional information is available, for example: • You can display the control cycle, material, plant, actual quantity, status, date of the last status change and so on by double-clicking the individual kanbans. • You can display the control cycle data by double-clicking the appropriate row on the kanban board. • You can navigate to the stock/requirements list, the stock overview, or the material master for a control cycle. • You can trigger the kanban correction facility for a control cycle.

Key Feature	Use
Cost accounting for Kanban	You have various options for controlling cost accounting for kanban with in-house production depending on which replenishment elements are used. If you use: • Run schedule quantities: The costs are collected in a product cost collector and can be settled periodically in product costing. • Manual kanban: The costs are also collected in a product cost collector. • Production orders or process orders: The costs are either collected in a product cost collector if you want to analyze the costs by periods rather than by lot, or they are settled to the individual production orders/process orders. Updates to the actual costs at the product cost collector can be triggered by logistical transactions (such as goods issues or confirmations) for production/process orders and run schedule headers. For example, goods issues for a production order or reporting point backflushes in repetitive manufacturing debit the product cost collector with actual costs. Goods receipts credit the product cost collector. Alternatively, the actual costs at the product cost collector can be updated directly through G/L account postings in Financial Accounting (FI), for example. You can access reports and view the actual costs for the product cost collector. During the period-end closing, you can: • Charge the product cost collector by means of template allocation. • Revaluate the activities at actual prices. • Calculate overhead for the product cost collector. • Calculate the value of your unfinished products (work in process) for the period. • Calculate the variances of the period. • Settle the work in process and variances to other application components.

2.7.4.5 JIT Outbound Processing

Business Background

Just in Time (JIT) Outbound Processing enables you to replenish direct materials required for manufacturing in the exact quantity and at exactly the time required. You can determine that the required materials are provided internally from a different location, for example. Or, you can specify that the required materials are provided by an external supplier. If you opt for material provision from an external supplier, you can use scheduling agreements with delivery schedules for procurement and production planning processes. JIT calls are used as a replenishment request and the fulfillment is done with reference to them.

Key Features

The following features are available:

Key Feature	Use
Summarized JIT call processing	You can use this feature for processing JIT calls that request a specific material, in a specific quantity, to be delivered at a specific time, to a specific location within your plant. The source of replenishment could either be another internal location resulting in a stock transfer, or an external supplier from whom you purchase the material. In the case of an external replenishment, you use purchasing scheduling agreements to support the supply planning and procurement processes involved. You use control cycles that enable and define the replenishment process. You start the process by creating the JIT call with reference to a control cycle. Depending on the source of replenishment and how you have configured the process, a set of sequenced actions is executed until the fulfilment is completed. When requesting the material from an external supplier, a delivery is expected as the basis for the goods receipt and the supplier invoice, or the credit memo processing. In the case of an internal replenishment, fulfilment is completed when you post the goods receipt which results in a stock transfer. You can monitor the status of the JIT call to track the progress.
Supply-to-production planning	You can use this feature for planning, triggering, and monitoring replenishment using summarized JIT calls. For each control cycle used for supply-to-production planning, the system calculates replenishment requirements taking account of: • Open JIT calls • Available stock at the production location • A defined minimum stock level • Component requirements from production planning
Forwarded sequenced JIT call processing	You can use this feature to forward a group of components of an inbound sequenced JIT call received from your customer to an external supplier who will assemble and deliver the component group. You use control cycles to enable and define the replenishment process. You can send a delivery confirmation to your supplier which is used for the invoicing process.

2.7.4.6 JIT Inbound Processing

Business Background

You can use this component if you, as a supplier, receive and process just-in-time (JIT) calls. Just-in-Time Inbound Processing enables you to produce and deliver materials in the exact quantity, for the exact time, and

even in the sequence defined by your customer. You use scheduling agreements with delivery schedules for sales and production planning processes.

The JIT inbound process starts with the receipt of JIT calls from your customer. Depending on your business scenario and material, the fulfillment of this request can trigger various different activities. You can monitor the fulfillment progress to ensure successful completion.

In sequenced JIT processing, your customer also specifies the sequence in which you are to deliver the products as well as production-related information. Your customer may send an initial call with subsequent updates later according to planning and production execution progress. You can use the initial call for planning or even production purposes. The last call update from your customer provides the final sequence and expected date and time for grouping, packing, and delivery. Your customer sends this information as soon as the production sequence is frozen or production has started meaning that no further changes are expected. This is particularly important when the material requested is different for each production lot depending on variant configuration.

In the case of more complex products with a high number of variants, the sequenced JIT call contains multiple call components instead of a single material. This information is also reflected in the delivery and is used as the basis for the billing or self-billing process. You have to take account of the sequence information in the JIT call when grouping, packing, and loading the requested materials for shipping.

Key Features

The following features are available:

Key Feature	Use
Summarized JIT call processing	You can process JIT calls from customers that request a specific material in a specific quantity to be delivered at a specific time to a specific location. The process starts with the receipt of the JIT call. Depending on how you have configured your process, you execute a set of sequenced actions until the customer requirement has been fulfilled. You can use the repetitive manufacturing solution to produce the JIT call material. You create a delivery document with reference to the JIT call for shipping the goods. This document is used as the basis for the goods issue posting and the billing process. You can monitor the status of the JIT call to track progress.

Key Feature	Use
Sequenced JIT call processing	You can process JIT calls from customers that request a specific material in a specific quantity to be delivered at a specific time to a specific location in a defined sequence. The process starts with the receipt of the JIT call. You can still receive further status updates for the JIT call from your customer providing additional or final data. The initial, external status of the JIT call may allow a pre-assembly whereas further external status updates allow for final assembly and shipping. Depending on how you have configured your process and the external status of the JIT call, you execute a set of sequenced actions until the customer requirement has been fulfilled. You can use the repetitive manufacturing solution to produce the JIT call material. You create a delivery document with reference to the JIT call for shipping the goods. This document is used as the basis for the goods issue posting and the billing process. Alternatively, the billing process can also be based on a delivery confirmation sent by the customer. You can monitor the status of the JIT call to track progress.

2.7.4.7 Outsourced Manufacturing

2.7.4.7.1 Basic Subcontracting

Business Background

Basic subcontracting provides you with the means to instruct a supplier or subcontractor to process a material for which you provide the components. When procuring materials externally, you use subcontracting purchase orders or schedule lines to alleviate capacity bottlenecks. Subcontracting purchase orders/schedule lines instruct your subcontractor to make a certain finished material using the components that you provide and potentially using additional components provided by the subcontractor.

Key Features

The following features are available for the external procurement of materials:

Key Feature	Use
Planning materials to be made by a subcontractor	This features enables you to plan your materials that are produced by a subcontractor. In the planning run, the system creates subcontracting purchase requisitions or schedule lines for the material which is made by the subcontractor, explodes the BOM of these materials, and creates subcontracting requirements. You may have more than one subcontractor that supplies one material and they may require different components to be provided while they procure the other components themselves. In this case, you have to create several production versions that cover the needs of your different subcontractors. The purchasing info record of the subcontractor references the appropriate production version.
Planning materials to be provided to subcontractor	This features enables you to plan the parts to be provided to your subcontractor. You can create an MRP area for each subcontractor which simplifies the planning process if you have several subcontractors. When planning the component materials with subcontracting MRP areas, the system checks whether the subcontracting requirements can be covered by existing inventory at your subcontractor's or whether you have already sent the parts to be provided to your subcontractor. If current inventory at your subcontractor does not cover the subcontracting requirements, the system creates a stock transfer reservation to transfer the demand from the subcontractor company to your company. You can then produce or procure the material and send it on to your subcontractor.

Key Feature	Use
Triggering the provisioning of the materials to be provided to subcontractor (subcontracting cockpit)	This feature provides you with a comprehensive overview of all relevant information about your subcontracting process. It provides a single entry point for all documents related to your subcontracting process providing direct access to the following features: • You can choose whether you want to send your components to the subcontractor using the one-step procedure, or the two-step procedure. You can check directly whether your components are already at the subcontractor's site, or still on the way there. • You can check which components are currently in the subcontracting stock. • When you create a subcontracting order, you can change the shipping point for the outbound delivery, or change the batch number. • For each purchase order item, you can display additional information such as the production order, the number of the external operation, or the operation text. For each purchase order item, you can create an outbound delivery that is displayed in the purchase order history for the corresponding item. You can also process the following documents centrally in the Subcontracting Cockpit: • Purchase orders • Purchase requisitions • Outbound deliveries with open goods issues • Reservations • External deliveries (subcontracting components that are prepared by a third party) Key data such as the supplier, material, or plant is displayed for each of these documents.
Goods receipt for parts made at subcontractor	The goods receipt of the subcontracting purchase order/schedule line triggers updates to inventory, purchasing statistics and so on. In addition, the system backflushes the components that were provided to the subcontractor.

2.7.4.7.2 Basic External Processing

Business Background

Basic external processing provides you with the means to instruct a supplier or subcontractor to process individual production steps such as operations or sub-operations. The external processing of production order operations is frequently used for standardized process steps such as galvanizing which you cannot perform in your own factory. In the case of galvanizing, you may have environmental reasons for outsourcing this step to your subcontractor. In this case, it does not matter to the subcontractor which material IDs are produced. The subcontractor is only responsible for processing (galvanizing) a certain quantity of (metal) pieces.

Key Features

The following features are available for basic external processing:

Key Feature	Use
Planning externally processed operations	When you convert a planned order into a production order, the system checks to see whether there are any routing/work center operations that require external processing. You can use external processing if you have individual production steps that are operations or sub-operations which are performed outside of your company by a supplier. This provides you with an alternative to in-house production if capacity bottlenecks occur. You can use an outline agreement to specify that a certain operation of the production order is executed by an external subcontractor on a regular basis.
Scheduling externally processed operations	When you perform scheduling, the system takes account of any external operations. The duration of an external operation is calculated either by using the planned delivery time or using the standard values. The system automatically creates a purchase requisition for the operation or sub-operation that requires external processing. This requisition is automatically updated with any quantity changes made to the production order. You should not convert the purchase requisition into a purchase order until the external processing is actually required. The reason for this is that any quantity changes made in the production order will automatically update the requisition. Once you have created the purchase order, it is printed and sent to the supplier.

Key Feature	Use
Triggering the provisioning of the materials to be provided to subcontractor (subcontracting cockpit)	This feature provides you with a comprehensive overview of all relevant information about your subcontracting process. It provides a single entry point for all documents related to your subcontracting process providing direct access to the following features: • You can choose whether you want to send your components to the subcontractor using the one-step procedure, or the two-step procedure. You can check directly whether your components are already at the subcontractor's site, or still on the way there. • You can check which components are currently in the subcontracting stock. • When you create a subcontracting order, you can change the shipping point for the outbound delivery, or change the batch number. • For each purchase order item, you can display additional information such as the production order, the number of the external operation, or the operation text. For each purchase order item, you can create an outbound delivery that is displayed in the purchase order history for the corresponding item. You can also process the following documents centrally in the Subcontracting Cockpit: • Purchase orders • Purchase requisitions • Outbound deliveries with open goods issues • Reservations • External deliveries (subcontracting components that are prepared by a third party) Key data such as the supplier, material, or plant is displayed for each of these documents.
Valuating externally processed operations	When data is maintained for an external activity, a cost element is specified. The cost element determines how the external activity is to be valuated. A decision needs to be made whether an operation or suboperation is processed externally via its control key. The control key determines whether externally processed operations are scheduled on the basis of their standard values or the planned delivery time. This information is needed to settle externally processed operations and suboperations that have been marked as relevant for costing in their control keys.
Goods receipt	When the supplier has completed the external processing, the material is shipped back. You receive the externally processed goods back into the warehouse. The supplier service is reflected in the production order by means of an operation confirmation. The purchase order and the production order both show the quantity received and the system updates the status of the operation accordingly.

2.7.5 Quality Management

2.7.5.1 Quality Planning

Business Background

Quality planning helps you to ensure the quality of your products, processes, and services right from the start. During the early stages of product design and development, it is important to have the correct quality tools and to implement appropriate quality-planning strategies in your processes.

Key Features

The following features are available:

Key Feature	Use
Failure Mode and Effects Analyses (FMEA)	You can use this feature when planning new products and processes. It enables you to prevent and avoid defects. You can perform a risk analysis and derive quality-specific actions that ensure high levels of quality.
Control plans	You use this feature in combination with the Failure Mode and Effects Analysis to perform an integrated inspection planning for goods receipt inspections and inspections during production. The control plan describes how products and processes are monitored. It contains tasks that are executed for each phase of the process.
Quality-related master data	For quality planning purposes, you define specifications and processes on a long-term basis as master records. You can define quality-related data for generic master data records, for example, material or supplier.
Inspection planning	You use the inspection planning functions to define inspection criteria (for example, material to be inspected, how the inspection is to take place, characteristics to be inspected, required test equipment, work center, and inspection specifications).

2.7.5.2 Quality Inspection

Business Background

You can prepare, execute, and monitor different types of quality inspections, for example, in purchasing, production, or sales scenarios.

Key Features

The following features are available:

Key Feature	Use
Inspection lot creation	An inspection lot represents the request to perform a quality inspection.
Inspection execution	This feature allows you to record the results of an inspection, for example, for an inspection lot.
Inspection completion	Once the inspection results have been recorded, the inspection lot is completed with the usage decision.
Dynamic modification of the inspection scope	You can define rules so that the system automatically determines the scope of the next inspection dependent on the latest inspection results. You can vary the sample size of the next inspection lot in stages between a predefined inspection scope and a skip.
Defects recording	You can record individual defect items.
Sample management	You use this feature for processing and managing samples. Sample management allows you to: • Flexibly plan the drawing of samples • Identify samples • Record inspection results for samples • Manage the sample data
Calibration inspections	You can plan and perform calibration inspections of test equipment. Based on the inspection results, you can verify the accuracy and suitability of test equipment for an inspection.
Stability studies	You use this feature to track and examine how different environmental conditions (for example, temperature, brightness, moisture) affect a compound, a material, or a batch over a specified period of time.
Quality certificates	You can manage quality certificates in inbound and outbound processes.

2.7.5.3 Quality Improvement

Business Background

Quality improvement provides tools that are the basis for improving your processes and products. You can gain better insights into your quality-related data and thereby reach your corporate quality goals.

Key Features

The following features are available:

Key Feature	Use
Quality notifications and root cause analysis	This feature allows you to record and process quality problems and complaints and to execute the problem-solving process including root cause analysis.
Corrective and preventive actions	You can trigger actions in order to solve a problem and to prevent the problem from re-curring.
Nonconformance management	This feature enables you to record and process defects. In order to correct the defects and to prevent them from recurring, you can trigger and process tasks.
Internal problem solving	You can resolve internal problems using the step-based 8D methodology.
Trigger external problem solving	SAP S/4HANA supports the integration with a collaborative problem-solving system (currently SAP Supplier Problem-Solving) to enable a collaborative problem-solving process together with suppliers. When the collaborative problem-solving system is integrated, you can trigger an exter-nal problem-solving process from a complaint against a supplier.
Quality analytics	An integrated set of quality data allows you to quickly identify systematic errors, ana-lyze problems, eliminate root causes, and respond faster to unforeseen events and de-viations. You can perform quality evaluations based on inspection results or based on issue data.
Audit management	An audit is a systematic examination for determining, evaluating, and documenting the extent to which an object fulfills predefined criteria. Audit management supports you in all phases of auditing.

2.7.6 Maintenance, Repair, and Overhaul

2.7.6.1 Maintenance, Repair, and Overhaul (MRO)

Business Background

Maintenance, Repair, and Overhaul (MRO) supports processes for hardware maintenance, component repair, and line maintenance for aftermarket services, post-delivery returns, and any form of repairs during the product life cycle.

Key Features

The following table explains the key features available:

Key Feature	Use
Inventory management	The MRO extension of inventory management is capable of procuring and then stocking a part using its original manufacturer's part number in the parts planning and consumption. The parts interchangeability feature allows the stocking of different manufacturers' parts that meet Form-Fit-Function rules, allowing MRP to calculate part demand and view stock across manufacturers' part numbers for part availability. It also has the capability to stock and repair customer-owned parts that are segregated by customer numbers.
Provisioning, Procurement, and Sales	This special procurement extension is primarily used by the airline industry, which uses the ATA Spec 2000 exchange to procure spare parts. Other industries would use the standard procurement solution. The Initial Provisioning component supports you in the selection and initial procurement of spares for a new fleet of aircraft, vehicles, equipment or other end products before you have established regular operational and maintenance processes. This solution also generates a detailed attachment for a resource-related debit memo request (DMR) or invoice. This attachment contains structured details of the resources you are billing to the customer, with the required level of detail for those industries that require such information; for example, the airline industry and the aerospace and defense contracting industry.

Key Feature	Use

Maintenance Planning	This includes:
	• Spare Parts Stock Calculation: This application determines an initial stock level for the part type required to supply a serviceable part, with probability of a specific percentage if the part in question fails. The probability is represented by the service level.
	• Work Packaging and Sequencing (WPS): This application summarizes processes and activities for planning and performing large maintenance tasks.
	• Mass Maintenance of Maintenance Plans: This function allows you to change several maintenance plans in the same way at the same time.
	• Maintenance Program Definition: This component provides a workbench that you can use to transform complex maintenance requirements into maintenance plans within the maintenance execution system.
	• Maintenance and Service Planning (MSP): You use MSP to carry out the following:
	  ○ Strategic planning over a long-term horizon, such as 5-10 years, allowing you to determine the resources necessary to meet future maintenance demands
	  ○ Tactical planning over a mid-term horizon, such as 1-18 months, to ensure that your maintenance objects remain serviceable, optimize utilization of your maintenance objects, and balance the resource load in your service areas

Key Feature	Use
Maintenance and Service Processing (MSP)	In maintenance and service processing, the primary objective is to ensure the hardware availability of technical objects. The process includes activities for tracking individual components during their entire life cycle, whether installed in the hardware, stored in a warehouse, or serviced in a workshop. Components are exchanged if they cannot be repaired in time, have reached their life limits, or are listed in service bulletin directives for replacement. In the case of rotables, an unserviceable component is placed in a warehouse and replaced by a new or serviceable component. In urgent cases (for example, if a component cannot be transferred to a line station in time), a component is taken from other equipment that is currently not in operation. Sometimes it is possible to swap identical components within an equipment number, instead of repairing the defective component. MSP features include: • Component Maintenance Cockpit (CMC) • Subcontracting for MRO Processes • Plant Maintenance and Customer Services (PM/CS) Orders in the MRO Process • Assignment of PM/CS Orders to Projects • Sharing of Spare Parts • Configuration Control • Logbook • Integration of Service Processing with Warranty Claims

2.7.7 Pegging and Distribution for Project Manufacturing

Business Background

Pegging and Distribution for Project Manufacturing can be used to optimize project manufacturing in an engineer-to-order scenario by processing common materials shared across multiple projects. This is based on connecting the source orders of grouped materials from the lower levels of the bill of materials to the higher levels.

Key Features

The following table explains the key features available:

Key Feature	Use
Assignment (Pegging)	You can use this feature to calculate the prorated assignments of the source orders of grouped materials in a grouped project stock segment to the individual project cost elements with the demand.
Cost Distribution (Distribution)	You can use this feature to distribute the costs for the source orders of grouped materials from the grouped project stock segment to the individual project cost elements based on the pegging assignments.

2.8 R&D / Engineering

2.8.1 Enterprise Portfolio and Project Management

2.8.1.1 Project Financial Control

Business Background

This capability enables you to define work breakdown structures as a basis for hierarchical project accounting. You can plan costs and budgets and track actual costs that are tightly integrated with core business processes. This provides you with better insight into the project progress and your project financial performance and enables you to avoid cost overruns in time.

Key Features

The following table explains the key features available:

Key Feature	Use
Maintenance of standard WBS	You use this feature to maintain the standard structures for your project. • A standard WBS is a neutral work breakdown structure that serves as a template for creating operative work breakdown structures. • A WBS contains the individual elements (WBS elements) that structure the standard project as well as general organizational data. When you create a standard WBS a standard project definition is automatically created.

Key Feature	Use
Maintenance of standard milestones	Standard milestones are used exclusively in the Project System as a source for creating milestones and other standard milestones. You can combine different standard milestones in a milestone group.
Maintenance of operative WBS	You can create projects, or change and display existing projects and project parts. A project comprises of a project definition, which serves as binding framework for all organizational element created within a project, and WBS elements, which describe either a certain task or a partial task that can be subdivided further. You can also use networks within projects to represent the flow of a project or of a task within a project. The structure tree displays the project object that you have selected in its hierarchical context. You can manually change the dependencies and assignments of individual project objects in the structure tree. You have access to both the worklist and templates. Templates are available during processing to create new objects or structures in the current project by adding new project objects, copying existing project structures or copying from standard project structures. For quicker access, you can store frequently used project data (project definitions, and WBS elements) in the worklist.

Key Feature	Use
Maintenance of Group WBS	Based on the grouping strategy for projects, you can choose one of the following options to organize grouping WBS elements: • Create a grouping WBS element and include it in the operative WBS structure for a specific project. You use this if you want tighter cost and part control and reporting for a specific project. • Create a grouping WBS element and include it in the group WBS structure within its own project. You use this if you share common parts across projects and want to optimize the various collective processes involving these common parts. You can maintain a grouping WBS element in the same way as an operative WBS element. However, a grouping WBS element must not have any components or network activities attached to it. A grouping WBS element has an associated grouping identifier. Data maintenance of a grouping WBS element includes listing of all the operative WBS elements that can participate in the collective processes controlled by it. Besides the project WBS structure, grouping WBS elements can also have a hierarchical structure similar to the Bill of Material (BOM) structure. In such a structure, all common parts across projects are organized at the lowest grouping WBS element levels and the project-specific parts are organized at the higher level. You can use grouping WBS elements to move cost to breakpoints such as other WBS elements and network activities. This helps to segregate costs of key parts and assemblies from the MRP-driving operative WBS elements and enables the system to automatically provide this data. The costs associated with excess stock, scrap, and loss tied to the MRP-driving operative WBS elements can be directed to other project WBS elements; this helps to report such costs separately.
Mass changes to change projects and networks	If you work with complex and long-running projects, it is often necessary to make large scale changes to master data or assignments. You can use the mass changes function to change projects and networks. You can also view a log containing all the objects that were changed as a result of this process.
Project Versions	A project version shows the state of the project at a certain point in time or at a certain status. You can create as many project versions as required. Some features include: • Document (as a history) the state of the project in the past • Can be used for comparison purposes • Open a project version and monitor different sets of dates and attributes of the project objects
Project Texts	You use this to maintain and display project texts for WBS elements and network activities. You can edit project texts either in the Project text catalog or during project maintenance.

Key Feature	Use
Resource related billing document	You use this to bill customers for work done, materials used, and other costs incurred in customer projects. The basis for creating a billing document is the billing request. During resource-related billing, the system creates dynamic items from the expenditure information (for example, costs for material, utilities, personnel, trips) which serve as basis to create a billing request. You can edit the items in resource-related billing using the following features: • You can determine whether the system bills the costs summarized for dynamic items in full, later, or does not include them in the billing request at all. • You can view the hierarchy sorted and combined per SD items. The prices for the items are calculated using SD pricing. You can edit individual or header items from resource-related billing, with the help of SD conditions.
Resource related intercompany billing	This enables the distribution of project revenue accrued in one company code between other company codes. The distribution of the revenue is dependent on the work performed by employees belonging to those company codes. Through internal billing, the revenue is distributed between the company codes based on cost unit rates or sales prices.
Progress Analysis	Progress analysis helps you to obtain information on the state of your project and how it is developing. This enables you to take corrective action if the project is varying from its plan. • You can determine planned and actual project progress values, and to compare the two sets of data. You can determine the relevant values at any time or as part of the period-end closing work that you plan.
Project period-end closing	Period-end closing is the framework for carrying out period-related commercial transactions. You use it to ensure that all the data belonging to a period is determined and that data is available for enterprise controlling purposes. These transactions are performed at the end of the period after the primary cost postings for the period have been made.
Line Item Reports	Business transactions can be documented as line items and stored in line item files. Actual Line Items for Cost and Revenues • You can use the actual line item report for projects to obtain flexible analyses of individual actual cost and revenue postings per various criteria. • You can change the format of the line item display. • A number of functions support you in analyzing line items using the line item report display. These include sorting, filters, totaling, and search. Plan Line Items for Cost and Revenue • In project cost planning, plan line items are only created for certain business transactions for which some prerequisites are fulfilled. • You can change the format of the plan line item display.

Key Feature	Use
Structure Information System	The structure information system gives you an overview of a single or multiple objects you select for a specific project, part of a project or across projects. You can use the structure overview to flexibly evaluate the structure of your project across different object types according to different criteria. The system displays the basic structure of the project in the overview.
Monitoring project related procurements	You can monitor purchase requisitions, purchase orders, account assigned to work breakdown structures.

2.8.1.2 Project Logistics Control

Business Background

This capability enables you define project structures consisting of work breakdown structures and network structure, plan and schedule project activities, control all procurement processes integrated with the core business process, and provide an insight into all logistic related execution aspects of a project.

For features related to work breakdown structures, refer to *Project Financial Control*.

Key Features

The following table explains the key features available:

Key Feature	Use
Maintaining standard networks	• You use this feature to maintain the standard network structures for your project. The project-neutral network structure can be used as a template when creating other standard networks or operative networks. • You can link standard networks with standard work breakdown structures in order to create project templates.

Key Feature	Use
Maintaining operative networks	• You can copy from a standard network or an operative network to create a new operative network. If you have assigned a standard network to a standard WBS, you can create an operative WBS at the same time that you create an operative network. • Relationships determine the chronological sequence of activities in a network or a standard network. Cross-network relationships enable you to spread the tasks to be performed over several individual and smaller networks thereby creating an overall network. • You can create milestones in networks, standard networks, work breakdown structures (WBS) and standard work breakdown structures (standard WBS). • You can display activities and their relationships in operative networks in a graphical view. The graph allows you to visualize dependencies and display further information of key elements. • You can display selected networks, assigned activities, activity elements as well as project definition and WBS element data using a Gantt chart. The graphical area along with the table enables you easily monitor the dates and major attributes of networks and projects.
Network Scheduling	Scheduling determines the earliest and latest start and finish dates for carrying out activities in the network and calculates the required capacity requirements. A network is always scheduled forwards and backwards. • Forward scheduling calculates the earliest start and finish dates of activities (earliest dates) and the scheduled finish date of the network. • Backward scheduling calculates the latest start and finish dates of activities (latest dates) and the scheduled start date of the network. In a complex project, the dependencies in a project can make the activities in one network dependent on the completion of activities in another network. You can use the function for the overall network scheduling where the networks are linked through certain relationships.
Materials in Project	• This helps you to plan and monitor project material requirements and costs, and to regulate and schedule the flow of materials. • If you only need a few material components in a project, you can assign these components to the network activities manually. • The bill of material (BOM) transfer component makes it easier for you to assign material components to network activities and keep this information up-to-date.

Key Feature	Use
Requirement Grouping	Requirements grouping is a planning procedure for projects within material requirements planning (MRP) . Material for a project can be managed in general plant stock or in individual stock. With individual stock you can follow materials that are required for a project with regards to stock levels and MRP separately. If you use valuated or non-valuated project stock, the material components are kept, from an MRP view, in individual stock segments for individual WBS elements. In material requirements grouping, the system groups several stock owners (WBS elements) together in one grouping WBS element. MRP creates procurement elements (planned orders or purchase requisitions) for the requirements from the grouped WBS elements. You can group requirements from WBS elements belonging to one project or from WBS elements belonging to several projects for the purpose of MRP. This includes: • Automatic grouping of all WBS elements in a project • Manually assigning WBS elements to several grouping WBS elements • Assigning materials to different grouping WBS elements according to the MRP group
Delivery from Project	You can use this to create deliveries in the Project System and consequently deliver material components that are assigned to a project. This contains information that is required for a delivery, for example the sold-to-party or delivery date. Since you can create deliveries in a project independently of a sales order, this data is saved in delivery information in the Project System.
Confirmations	• Confirmations document the state of processing for activities and activity elements in a network, and can be used to forecast progress in the future. • Precise confirmations are very important for realistic and accurate project planning.
Project Texts	You use this to maintain and display project texts for WBS elements and network activities. You can edit project texts either in the Project text catalog or during project maintenance.
Simulation Versions	Simulation versions allow to simulate changes with regard to the project objects, planned costs and dates without affecting the operative project.You can: • Create a simulation version for a project by either transferring data from operative project or completely independently • Open a simulation version and monitor different sets of dates and attributes of the project objects
Project-Oriented Procurement	This is used to consolidate the information from the procurement process from a variety of applications that can be configured by the user. You can process the information from the procurement process for objects in the Project System, and execute individual procurement functions.

2.8.2 Product Development Foundation

2.8.2.1 Bills of Material

Business Background

A bill of material (BOM) is a formally structured list of the components that make up a product. The list contains the object number of each component, together with the quantity and unit of measure. The components are known as BOM items. BOMs are used in various situations where a finished product is assembled from several component parts or materials. They contain important basic data for numerous areas of a company.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage bills of material	You can create a complete, formally structured list of the components that make up a product.
Assign BOMs to plants	You can extend the area of validity of a BOM that you defined when you first created it. This means, for example, that you can assign the same BOM to a material in different plants - avoiding data redundancy and multiple data entry.
Monitor multilevel BOM assignment	You can use a reporting function that determines all components in a product and displays them per low-level code.
Find BOM for component	You can use a reporting function that determines where an object (for example, material) is used and the quantity that is required. This is necessary, for example, if objects are used in more than one context. You can use this information to: • Select products that are affected by a change to an individual part • Calculate the effect on the cost of a product if the price of a raw material rises
Manage sales order bill of material	You can create and maintain sales order-specific bills of material to meet your requirements.

2.8.2.2 Product Structure Management

Business Background

A product structure is an enhanced engineering bill of material (BOM). It consists of a set of hierarchically ordered objects with the purpose of documenting one product or a set of similar products. This is effective for high-volume, repetitive manufacturing, for example, in the automotive industry, as well as for complex machinery and equipment.

If you work with products that have many variants and a large number of components, you can use product structure management to optimize process support from early engineering, to hand-over to manufacturing.

Product visualization tools allow you to manage geometric data and view digital mockups in your product structures via viewable files.

Product structures provide the following benefits:

- Possible to create and maintain a product structure without assigning materials
- A redundancy-free description of products or product families with many variants
- Variant configuration and variant management capabilities
- The option of working with both configurable and configured materials
- Continuous modeling from an early stage to the manufacturing handover
- Modeling of functional structures (with no requirement for material number references)
- Template structures for the creation of product structures and the standardization of product descriptions
- A consistent data basis for different views of the product and for all enterprise areas

Key Features

The following table explains the key features available:

Key Feature	Use
Modeling product structures	You can use product structures to model a multilevel product hierarchy. When modeling your product structure, you have the flexibility to develop the structure and the variants without having to create master data. You can model a configurable product with multiple combinations and possible scenarios.
Simulating the product configuration	You can check the product configuration by simulating the explosion of a product structure for a specific set of configuration parameters. You can save, edit, and activate these simulations.
Managing geometric data	You can assign geometric data to support the transition of transformation matrices into product structures. Together with viewable files, the geometric data enables dynamic viewing based on simulations offered by the product structure.

Key Feature	Use
Viewing digital mockups	Digital mockups, which are triggered at various stages of new product design, enable design engineers, product engineers, and manufacturing engineers to study the content developed before it is handed over to the next department. You can view a digital mockup in the product structure.

2.8.2.3 Embedded Systems Development

2.8.2.3.1 Embedded Software Management

Business Background

Embedded software is computer software that is embedded in one or multiple products. It provides functions together with various hardware and systems. For example, embedded software can be used to control or optimize the functions of the mechanical part or the electrical part of a product.

If you work with products that have one or multiple pieces of embedded software, you can use embedded software management to view and manage your software.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing Software	You can manage embedded software and its versions in a product structure or a bill of material (BOM).

2.8.2.4 Engineering Change Management

Business Background

Engineering change management capabilities can be used to track the changes made to various aspects of production basic data (for example, bills of material, materials, and routings). Change implementation can be controlled by either date effectivity or parameter effectivity (based on specific conditions).

For enhanced engineering change management capabilities including support for managed change processes, see Engineering Change Management [page 427].

Key Features

The following table explains the key features available:

Key Feature	Use
Change master record handling	You can define change master records. Change master records contain descriptive data, such as the reason for the change, and data with control functions, such as valid-from date and indicators for object types. In addition to this data, which you can maintain directly, there is data that the system updates automatically, such as administrative data.
Revision level assignment	You can identify material changes that are made with reference to a change number by using revision levels. A revision level can be assigned on a valid-from date when an object is changed with reference to a change number.

2.8.2.5 Classification

Business Background

The classification system allows you to use characteristics to describe various types of objects, and to group similar objects in classes – to classify objects, in other words, so that you can find them more easily later. You then use the classes to help you to find objects, using the characteristics defined in them as search criteria. This ensures that you can find objects with similar or identical characteristics as quickly as possible.

Classes allow you to group objects together according to criteria that you define:

- You create classes for certain object types such as, for example, material or material BOM.
- You use the class type to determine which object types can be classified in a class.
- You can assign characteristics to your class. These describe the objects that you classify in your class. When you assign a characteristic to a class, you can adapt (overwrite) the characteristic.

Key Features

The following table explains the key features available:

Key Feature	Use
Classification handling	You can define classes and their characteristics including characteristic values.
Finding objects	Once you have set up a classification system in your company, you can search for the objects you have classified. You can also identify where a specific characteristic and characteristic value is used.

2.8.2.6 Document Management

Business Background

Document management allows you to store, manage, and use documents when creating and maintaining digital product information company-wide and throughout the life cycle of a product. The following examples show some of the uses of document management in different areas of a company:

- In the design office, document management can be used to manage drawings. All design drawings can be linked to material masters.
- Companies that process complex documents can use document structures to organize these documents. All documents and texts that are logically connected can be grouped together in one document structure.
- A routing contains the sequence of operations for manufacturing a product. Documents can be allocated to the operations in a routing. These documents may be used, for example, to describe the specifications of a product, or to store inspection requirements.
- Documents can be linked to projects. You can use the document hierarchy to represent individual product folders that are given to the product administrators responsible.

Key Features

The following table explains the key features available:

Key Feature	Use
Document handling	To store and manage a document, you create a document info record that contains all of the data required to process and manage a document including the original document itself.
Find Document: Selection Criteria	To find documents that are maintained in document management using any of the search criteria. You can use known data for the document search function that is either directly related to the document info record or comes from the environment of the document. This data is known as selection criteria. To find a document, you can use document data, classification, object links, and texts as the search criteria.
Integration with SAP Document Center	This solution provides a quick and safe data exchange platform for managing documents from mobile and other devices considering the Document Management System (DMS) authorization. You can access public and private folders from DMS and organize files or document info records (DIR) within these folders. You can also query for documents based on DIR attributes by using the *Search* function. Documents and folders can also be synchronized with the client and modified offline. The changes can be synchronized with DMS when the user is online. The DIR files can also be shared with colleagues and business partners using the *Share* function. Currently this integration only exists for On-Premise delivery.

Key Feature	Use
Integration with SAP S/4HANA Cloud for intelligent product design	S/4HANA Cloud for intelligent product design is a cloud solution that offers you a collaboration platform that can be used in all phases of your product development. You can store engineering documents as well as share and review them with internal and external participants using a process driven approach. Using the integration of intelligent product design with Document Management (DMS), you can upload documents from DMS to a collaboration to collaborate with internal and stakeholders. The collaboration could result in existing documents being modified or new documents being created. These document changes in a collaboration can be downloaded to DMS for further downstream processes.

2.8.2.6.1 Maintain Documents

Use

With this app, you can manage document info record and any original application files that belong to it by entering the document number and document type. You can create, change, search, and display document info records with the role `SAP_BR_DESIGN_ENGINEER`. You can upload, download, check-in, or check-out original application files. You can also attach URLs to the document info records.

2.8.2.7 Attachment Service

Business Background

Attachment Service is a reusable user interface component which can be consumed by any FIORI application to attach documents (referred as attachments). The attachments are stored in the following storage repositories:

- SAP Cloud Platform-Document Service (in S/4 HANA Cloud solution)
- SAP Content Server Configuration (in S/4 HANA On-Premise solution)

This re-usable component is based on the `UploadCollection` control from the SAP UI5 foundation. Attachments are linked to business objects based on Document Management or via Generic Object Services (GOS).

Key Features

The following table explains the key features available:

Key Feature	Use
Manage attachments	You can upload, download, delete, and rename an attachment. You can also cancel the changes made to the attachments.
Attribute and Action Handling	This function allows the consuming applications to control the visibility of attributes and actions of the attachments on the User interface. By default all attributes and actions are visible on the user interface for the user. You can restrict the user from viewing attributes and actions by setting values as false in the `JSON` structure declared in the attachment service `controller.js` file.
Checking for Attachment Content State	This function allows the consuming applications to check the state of the attachment content. If you have made any changes to the content of the attachment and not saved, then the attachments content is dirty. Even if you have just refreshed the browser without saving or cancelling the changes, these changes are recorded and the application state is dirty. If the application state is dirty, you have to explicitly save the attachment.
Counting Attachments for a Consuming Application	This function allows the consuming applications to get a count of attachments associated to an object without having to see the attachment view. You can check the count of confirmed, unconfirmed, and total attachments.

2.8.2.8 Variant Configuration

Business Background

Variant configuration is for manufacturing complex products. Manufacturers often have to offer new variants of their products, and new variants can be created by modifying existing product designs as they process the order. The important thing is to react quickly to customers' requirements.

The customer determines the features of the product. A customer buying a car, for example, can choose the features of the car and combine these features as required. The product configurator improves information exchange between sales, engineering, and production. Variant configuration helps the customer or salesperson to put together specifications for the product and ensure that the product can be produced from these specifications.

Key features

The following features are available:

Key feature	Use
Manage configuration model	You can use a configurable material to cover all variants of a product in your company. • A class is used to hold the characteristics that describe a configurable material. By linking the class to the configurable material, you allow the material to be configured using the characteristics of the class. • You can create a super BOM and a super routing for a configurable material, containing all the components and operations for producing all variants of the product. • Often not all combinations of features are possible for either technical or marketing reasons. You can use dependencies and constraints to control which combinations are allowed • In configuration profiles for configurable objects you define central settings for configuring the object. • You can use variant conditions to influence the price of a configurable material depending on the characteristic values assigned.
Manage material variants	You can create a material variant, which is a material that can be kept in stock and that arises from an individual configuration of a configurable product.
Interactive configuration	During configuration, e.g. in Sales Order, the user assigns values to characteristics. Dependencies and constraints coming from the configuration model are considered.
Configuration simulation	You can use the configuration simulation to check your configuration model. In the configuration simulation, you can test whether you have created the objects correctly and whether your dependencies work.
Low Level Configuration	Low-level configuration refers to “background” explosions of configurable objects, like bills of material (BOMs) or routings. E.g. it’s used in material requirements planning (MRP). Here characteristic values from the sales order are automatically used to determine the BOM components and operations or activities.

Related features

Classification [page 104]

2.8.3 Integration with External Extended Producer Responsibility Solutions

SAP S/4HANA supports the integration with external extended producer responsibility solutions (currently SAP Responsible Design and Production) to allow you to consider information from SAP S/4HANA in the external extended producer responsibility solution.

Key Features

When an extended producer responsibility solution is integrated, SAP S/4HANA supports you to extract and push relevant data (for example, packaging data, deliveries, batches) for the solution.

2.9 Sales

2.9.1 Sales Force Support

Business Background

Sales Force Support supports the entire presales lifecycle, from an appointment, through the creation of leads and then opportunities.

Key Features

The following table details the key features available:

Key Feature	Use
Account and contact management	You can use account and contact management to manage and provide easy access to accounts and contacts.
Activity management and visit planning	You can use activity management and visit planning to record all activities of the employees of your company. This includes making appointments and creating tasks.

Key Feature	Use
Opportunity and pipeline management	You can use opportunity and pipeline management to control your sales process. An opportunity describes the sales prospect, the requested products or services, budget, potential sales volume, and the estimated sales probability.
Sales lead management	You can use lead management to facilitate your company's chance to do business. It automates the initial presales process and creates a link between first interest and sales and accelerates this process.

2.9.2 Order and Contract Management

2.9.2.1 Sales Master Data Management

Business Background

You can use sales master data management to improve sales processing efficiency and to assist in the fulfillment of customized basic functions.

Master data in Sales represents common, basic business data that can be directly reused across sales activities and for basic functions. It's centrally maintained and remains relatively static in the system.

Key Features

The following table explains the key features available:

Key Feature	Use
Customer materials definition	You use this feature when your customer manages a product (that is, a material) using a number that differs from the number that your company uses.
Material determination	You can maintain material (that is, product) determination records to help enable the automated replacement of a product number entered in sales documents with a target product number.
Listing and exclusion	You can maintain material (that is, product) listing records and exclusion records, which specify which products customers can or can't buy.
Item proposal	You can maintain frequently used combinations of products (that is, materials) and order quantities as item proposals. During sales order processing, the system can propose product and quantity information from the maintained records.

Key Feature	Use
Text control	You can maintain texts in master records (for customers, products, and customer materials) and sales and distribution (SD) documents. Based on predefined text determinations rules, texts can be automatically copied from master records or preceding documents to target documents during sales processing.
Partner control	You can maintain partner relationships in customer master records and SD documents. Based on predefined partner determination rules, partners can be automatically copied from customer master records or preceding documents to target documents during sales processing.

Related Information

Central Master Data [page 220]

2.9.2.2 Price Management

Business Background

You can use price management to improve sales processes with accurate, structured, and accessible master data.

Key Features

The following table explains the key features available:

Key Feature	Use
Price master data	You use this feature to define price master data.
Configuration of pricing	You use this feature to set up the pricing process in business documents. This includes how price master data is determined and how net values are calculated.
Pricing process in business documents	You use this feature to calculate and adapt accurate prices based on the price master data and the configuration of pricing. This feature is available for all price-relevant business documents of the sales process.

2.9.2.3 Sales Quotation Management

Business Background

You can create sales quotations for your customers.

Key Features

The following table explains the key features available:

Key Feature	Use
Sales quotation processing	You use this feature to create, change, or display a quotation for your customers. The process starts when a request for quotation (RFQ) is received from your customer. In response to the customer's RFQ, a quotation is created. The customer can then either accept the quotation or reject it. This step enables you to assure your business partners that you will deliver a product quantity at a specified time and price. If accepted, the quotation is transferred into a sales order. In addition, you can list all quotations, expiring quotations, expired quotations, completed quotations, and incomplete quotations
Sales quotation approval processing	You can set up approval processes for sales quotations. This helps you ensure that sales quotations in the approval process are rejected, reworked, or approved, as needed.

2.9.2.4 Solution Quotation Management

Business Background

Using solution quotations, you can offer solutions to your customers by creating quotations for combinations of different types of products (such as tangible products, services, and service contract items). These combinations of products can be modeled as product bundles in your master data.

Key Features

The following table explains the key features available:

Key Feature	Use
Solution quotation processing	You can create and edit solution quotations and include various types of items in solution quotations according to your business requirements. When released solution quotations are accepted, the creation of follow-up transactions is automatically triggered. The type of the follow-up transaction is determined by the item types that the solution quotation contains.
Product bundles	You can add product bundles as individual items to solution quotations to sell a combination of products together, as a package. You can display product bundles in a hierarchical view (bundle products as main items and bundle components as sub-items). Depending on how the product bundle is configured, you can choose between alternative bundle components within one bundle component group and select (or deselect) optional bundle components.

2.9.2.5 Sales Contract Management

Business Background

A sales contract is an outline sales agreement that contains special conditions negotiated between the vendor and a customer, for example, price, target value or target quantity. A sales contract is valid for a specified period. A customer submits a sales order to release products from the amount agreed in the contract. Types of sales contract include value contracts and quantity contracts.

Key Features

The following table explains the key features available:

Key Feature	Use
Contract processing	You use this feature to create, change, display, and list contracts. You can list incomplete contracts, completed contracts, expiring contracts, and expired contracts.
Contract release order processing	You use this feature to enable your customer to request part of the total quantity or value of goods or services agreed in a contract. The release order contains information on quantities and delivery dates.

Key Feature	Use
Contract fulfillment rate tracking	You can analyze how the sales contracts that you are responsible for are being fulfilled. You can focus on contracts with the highest target value. You can drill down to sales contract fulfillment rates by selected criteria.
Customer scheduling agreement	You use this feature to schedule an outline agreement with the customer containing delivery quantities and dates. These are entered as schedule lines in a delivery schedule. You fulfill a scheduling agreement by creating the deliveries in the schedule as they become due.
Global Trade Management	For information about the key features of Global Trade Management, please see Global Trade Management [page 114].
Data aging	The system moves your old sales data to the historical area of the database during data aging. When you analyze contract fulfillment rates, the system uses current data only and does not retrieve historical data. **i Note** Please note that for customers using SAP S/4HANA Cloud, private edition, this feature might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

2.9.2.5.1 Global Trade Management

Business Background

In trade, it is necessary to control and organize the flow of materials and services from suppliers to customers. Sales and purchasing processes are carried out simultaneously by the same trading department.

A trade transaction begins when a commercial customer approaches a trading company with a specific request, that is, a customer sends a sales order. If the trading company accepts the mandate, it organizes fulfillment individually for that specific request (sales order). Fulfillment is characterized by a high degree of complexity and includes, but is not limited to:

- Searching for the most suitable suppliers
- Organizing logistics from supplier to customer (shipping, transportation, customs clearance for the goods)
- Risk protection
- Financial management of the core business
- Handling of any associated expenses

The supplier then delivers the goods to the customer, either directly or via the trader's warehouse. The trading company receives an invoice from the supplier and bills the customer. Finally, the trader receives a payment from the customer and makes a payment to the supplier. Also typical is that a trading company's profitability analysis is based on individual commercial deals.

Key Features

The following table explains the key features available:

Key Feature	Use

Single point of entry for contracts between customers and suppliers	• Creation of trading contracts that contain sales-side data for the requirements of individual customers and, at the same time, the purchasing-side data used to order from suppliers to fulfill the requirements of the customer
	• Settlement of trade expenses by using settlement documents
	• Trade use cases:
	  ○ Import/Export
	  ○ Domestic
	  ○ Offshore

Creation of follow-on documents	Generation of sales orders and purchase orders automatically or manually based on the trading contract status
Monitoring of document flow and processing status of all subsequent transactions associated	• Complete overview of the contract lifecycle • Easy navigation to follow-on documents
Portfolio management	• Definition of portfolios as predefined selection groups • Automatic or manual classification of contract items by portfolio to optimize the use of sales-side and purchasing-side quantities • Monitoring of contract positions • Reporting on similar materials • Control of important materials, countries/regions, customers or suppliers in view of risk consideration
Association management	• Monitoring and processing of document items to reduce inventory risk and lost sales for an assigned portfolio • Open quantity information • Long-short analysis on either the purchasing side or the sales side • Overview of all current items that have not yet been completely processed
Trade expense management	• Handling of various kinds of costs, including freight, loading charges, storage costs, insurance, customs duty, and commissions • Planning of trading expenses on contract creation • Settlement of planned and unplanned expenses on contract level of trade transactions that incur costs • Posting of sales and purchasing expenses to specific G/L accounts • Posting of expenses to accounts payable and accounts receivable

Key Feature	Use
Archiving	Archiving of trading contracts and other relevant documents, such as settlement management documents to remove volumes of data from the database that are no longer required in the system, but still need to be kept for analysis purposes

2.9.2.6 Sales Order Management and Processing

Business Background

Sales order management and processing allows you to execute business transactions based on sales documents, such as inquiry, quotation, and sales order, defined in the system. Within sales order management and processing, you enter a sales document based on customer requirements. When you create or changes sales documents, the system confirms dates and quantities. You can display and change the sales documents to respond to customer questions.

There are different ways you can process sales documents in the system, depending on your specific needs. In the simplest case, you can enter a sales document with several items in a single screen. The system automatically proposes data from the relevant master records:

- From the customer master record of the sold-to party, the system proposes sales, shipping, pricing, and billing data. In addition, the system copies customer-specific master data about texts, partners, and contact people at the customer site.
- For each product (that is, material) in the sales document, the system automatically proposes data from the relevant material master records, such as data for pricing, delivery scheduling, availability check, tax determination, and weight and volume determination.

The data proposed by the system can be used as a basis for your sales document. If processing requires it, you can modify this data manually or add new data. For example, your pricing policy may allow you to manually change the value of certain discounts within a permitted range. In addition, you can branch in the sales document to a number of different screens where you can display and modify data, such as terms of payment and delivery data.

It is also easy to create a sales document with reference to an existing document. For example, if a customer accepts a quotation you sent, the system can copy all the relevant master data from the quotation when you create the sales order. When you process a sales document, the system can automatically carry out basic functions, such as the following:

- Pricing
- Availability check (if this function is defined in the material master record)
- Transferring requirements to materials planning (MRP)
- Delivery scheduling
- Shipping point and route determination (for the sales order)
- Credit limit check

Key Features

The following table explains the key features available:

Key Feature	Use
Sales order processing	You use this feature to create, change, and display sales orders. When you create sales orders, the system proposes products and quantities. In addition, you can list the following: sales orders, duplicate sales orders, and incomplete sales orders. You can release sales orders for billing.
Inquiry processing	You can use this feature to enable your customer to request a quotation or sales information without obligation. An inquiry can relate to products (that is, materials) or services, conditions, and if necessary, delivery dates. The sales area that accepts the inquiry becomes responsible for providing a quote. In addition, you can list inquiries and incomplete inquiries.
Credit management	You use this feature to check the credit limit when you create or change sales documents. If you change quantities or values in a document, the check is repeated. The system totals the receivables, the open items, and the credit value of the sales order for every item of a sales document. The system displays information about what caused blocks. When your credit department manually reviews the customer's current credit situation and when the sales order is approved, the system removes the block from the sales order.
Product availability check	You use this feature to determine on which date and in which quantity a requirement can be confirmed, based on a specified checking rule and the current supply situation for a specific product (that is, material). The availability check takes concurrent requirements of differing types and their respective confirmation situation into consideration.
Product allocation	You use this feature to allocate product quantities (that is, material quantities) for a specific time period and to a combination of characteristic values for sales orders and stock transport orders, against which availability checks can be run.
Backorder processing	You can use this feature to re-prioritize sales orders and stock transport orders and perform automated mass availability checks to ensure that a limited supply of product (that is, material) is distributed in accordance with a specific strategy. Optionally, your system assigns specific supply elements to the individual requirements. You can monitor the check results and, if necessary, rerun the check to improve the confirmations for the requirements.
Sales order processing with customer down payment	You use this feature when customers are required to pay some amount in advance before delivery of goods (for example, in make-to-order production). You can create requests for down payment, record the receipt of the down payment, and create a final invoice after the deduction of the down payment received. You can also create a receipt of the final amount due on the invoice.

Key Feature	Use
Sales order processing with trade finance transactions	You use this feature to guarantee the payment of your sales orders with trade finance transactions (for example, a letter of credit transaction).
Sales order processing with consignment stock	You use this feature if you want to deliver products (that is, materials) from consignment stock (owned by an external supplier).
Sales document processing for make-to-order scenario	You use this feature for production in which products are made upon receipt of an order from a customer.
Sales order processing for free-of-charge delivery	You use this feature to provide goods to a customer at no charge. A sales order type is created that is not billing relevant. The order is confirmed based on the availability of goods. A delivery is then created and the goods are subsequently picked, confirmed, and delivered to your customer.
Sales order processing for third-party direct ship	You use this feature when another company, rather than your company, delivers the items requested by your customer. You can either create your invoice based on the invoice from your third-party supplier or you can book the delivered amount directly as a statistical goods receipt.
Sales order processing with returnable packaging	You use this feature to capture information within the sales order that reusable packaging should be returned back into inventory (for example, standard pallets belonging to the manufacturer).
Processing sales documents with customer expected prices	You use this feature to display sales document items which are locked due to discrepancies between the customer-expected price and the net price. You can resolve discrepancies and release items for further document processing by either accepting or declining the customer-expected price. You can also reject sales document items.
Listing sales documents by object status	You use this feature to search for sales documents and sales document items and display them in a list.
Mass change of sales documents	You can make changes to multiple categories of sales documents at the same time (for example, sales orders and sales contracts).
Sales order approval processing	You can set up approval processes for sales orders. This helps you ensure that sales orders in the approval process are rejected, reworked, or approved, as needed.

Related Information

Sales Quotation Management [page 112]

2.9.2.7 Business Solution Portfolio

Business Background

Business solution portfolios bundle service contract items, service order items, sales order items, and subscription contract items that are related to a solution and its customer. This enables you to retain an overview of these items in the customer's business solution.

Key Features

The following table explains the key features available:

Key Feature	Use
Create business solution portfolios from solution quotations	If an external reference (business solution portfolio reference) has been added to a solution quotation and it has been accepted, the system creates the business solution portfolio (using an API) and assigns the relevant service contract items, service order items, sales order items, and subscription order items.
Manually create, change, and delete business solution portfolio	You can create a business solution portfolio manually for a customer. You can also change its data and delete the business solution portfolio.
Search, filter, and display business solution portfolios	You can search and filter for specific business solution portfolios and display the results.
Add and remove items	You can add and remove service contract items, service order items, sales order items, and subscription contract items from a business solution portfolio.

2.9.2.8 Sales Billing

Business Background

You can create and manage billing documents, post them to financial accounting, and output them to a variety of channels. You can also create and manage billing-related documents such as invoice lists, preliminary billing documents, and billing document requests.

Key Features

The following table explains the key features available:

Key Feature	Use
Debit memo processing	You use this feature to apply a debit to a customer account, either by creating a debit memo request, or directly by creating a debit memo with reference to a billing document. A debit memo request (that is, an invoice increase request) is then created with the amount to be debited. The debit memo is sent to the customer and posted to accounting.
Credit memo processing	You can use this feature to apply a credit to a customer account, either by creating a credit memo request, or directly by creating a credit memo with reference to a billing document. The credit memo is sent to the customer and posted to accounting.
Billing document processing	You can create billing documents (for example, invoices for customers) from items in the billing due list (for example, debit memo requests and outbound deliveries). When you post billing documents, the system forwards billing documents to accounts receivable and triggers output (for example, an invoice by e-mail). You can change or cancel billing documents as needed. You can also create billing documents for retroactive billing. You can setup billing batch execution by scheduling billing creation and scheduling billing output. You can also schedule billing documents for release to accounting. You can manage documents blocked for billing.
Preliminary billing document processing	You can create preliminary billing documents from items in the billing due list. You can view a filtered list of all preliminary billing documents in the system. You can display preliminary billing documents in detail or view a concise summary. You can change attributes of preliminary billing documents (such as prices, texts, and the billing date). You can also add and remove attachments. You can preview preliminary billing document output and send the output. You can create billing documents based on preliminary billing documents. You can schedule the creation of preliminary billing documents. You can also schedule the creation of billing documents with reference to preliminary billing documents.
Approval processing for preliminary billing documents	You can set up approval processes for preliminary billing documents. This helps you ensure that preliminary billing documents in the approval process are rejected, reworked, or approved, as needed.

Key Feature	Use
Invoice list processing	You use this feature to create, at specified time intervals or on specific dates, a list of billing documents (invoices, credit and debit memos) to send to a particular payer (usually the head office of a corporate group). The billing documents in the invoice list can be single or collective documents (collective invoices combine items from more than one delivery). There are two types of invoice lists, one for invoices and debit memos and one for credit memos. If you wish, you can process invoices, debit memos, and credit memos at the same time. The system automatically creates a separate invoice list for credit memos.
Invoice correction processing	You use this feature to create an invoice correction request if the wrong quantities or prices have been calculated for the customer. The invoice correction request can be automatically blocked by the system until it has been checked. The system calculates the difference between the amount that was originally calculated and the corrected amount for each item. Once it has been approved, you can remove the block. The system creates a credit or debit memo with reference to the invoice correction request. The credit or debit memo is sent to the customer and posted to accounting.

2.9.2.9 Solution Billing

Business Background

You can use solution billing to combine billing data from sold products, services, and projects into a single, combined customer invoice.

Key Features

The following table explains the key features available:

Key Feature	Use
Omnichannel convergent billing	You can use convergent billing to converge billing data from different categories of billing due list items (such as sales orders, outbound deliveries, and debit memo requests) to create combined, single invoices for customers. You can use omnichannel convergent billing to converge billing data from your SAP S/4HANA system with billing data from one or more external sources. The external billing data is persisted in your system in the form of external billing document requests (EBDRs). You can create EBDRs automatically by integrating external systems that send billing data, or you can create them manually by uploading billing data stored in spreadsheet files. EBDRs are added to the billing due list, from where they can be converged with your other billing due list items to create combined, single invoices for customers. Stand-alone billing of EBDRs is also possible.

2.9.2.10 Sales Rebate Management

Business Background

You can use *Settlement Management* for your sales rebate management.

Related Information

Settlement Management [page 43]

2.9.2.11 Incentive and Commission Management

Business Background

You can use *Settlement Management* for your incentive and commission management.

Related Information

Settlement Management [page 43]

2.9.2.12 Claims, Returns, and Refund Management

Business Background

Claims, returns, and refund management enables you to streamline complaints and returns management. You can improve tracking, help your service organizations process requests faster, and reduce your operational costs. You can improve the capture and handling of all complaints and returns and trigger logistical follow-up actions such as inspection of returned products (that is, materials), resolution of issues, and claims and refunds management.

Key Features

The following table explains the key features available:

Key Feature	Use
Product and warranty registration	You can create warranties and assign technical objects to those warranties.
Warranty claim processing	Enables manufacturers, importers, or vendors of complex products and their suppliers to better deal with a large number of warranty claims. Only those claims that produce negative results in the automatic checks are included in manual processing.
Returns management processing	You use this feature for processing customer returns. The process starts a returns order with reference to the original sales order or invoice for the goods. A return material authorization (RMA) document is forwarded to the customer to be attached to the incoming goods. The goods are shipped back, a returns delivery is created with reference to the returns order, and the product (that is, material) is received into returns stock. The returns stock location is set as non-MRP relevant. The goods are inspected and either selected for return to stock, for scrapping, or for other logistical processing (for example, for forwarding to the supplier). A credit memo is created from the billing run and posted to the customer's account or a replacement delivery is triggered to compensate the customer.
Customer return approval processing	You can set up approval processes for customer returns. This helps you ensure that customer returns in the approval process are rejected, reworked, or approved, as needed.

Key Feature	Use
Credit memo request approval processing	You can set up approval processes for credit memo requests. This helps you ensure that credit memo requests in the approval process are rejected, reworked, or approved, as needed.

2.9.2.13 Sales Monitoring and Analytics

Business Background

You can efficiently check the status of your sales orders.

Key Features

The following features are available:

Key Feature	Use
Managing sales plans	You can create, change, release, and display sales plans. In a sales plan, you set sales targets on various dimensions for a planned period.
Comparing planned and actual sales data	You can analyze to what extent your sales targets are being achieved and thus gain insights into your current sales performance.
Analyzing sales quotations	You can analyze your sales quotations according to flexible combinations of dimensions.
Analyzing quotation conversion rates	You can analyze how the quotations that you are responsible for are being referenced. You can focus on quotations with the highest net values and quotations with the lowest conversion rates. You can drill down to quotation conversion rates by selected criteria. You can perform modeling-based predictions on quotation conversion according to selected criteria. By comparing the actual and predicted results, you can predict to what extent your quotations could be converted into sales orders.
Analyzing incoming sales orders	You can view sales order KPIs in a monthly rolling trend as a graphic or in a table with the display currency. You can drill down to view detailed information for selected sales organizations, products (that is, materials), product groups (that is, material groups), sold-to parties, sales document types and so on. You can filter the items according to various criteria, such as year, month, sales organization, product group, and sold-to party.

Key Feature	Use
Listing incomplete sales documents	You can search for incomplete sales documents and display them in a list. You can display the number of issues with incomplete data.
Analyzing sales scheduling agreements	You can monitor product demand based on sales scheduling agreements.
Managing duplicate sales documents	You can search for duplicate sales documents (for example, sales orders, quotations, and returns) and reject the ones not required.
Monitoring sales order fulfillment	You can monitor and resolve issues that stop sales orders from being fulfilled, for example, a delivery or billing block. You can display your weekly workload with all overdue issues and all issues due in the next 7 days. You can display and resolve issues with incomplete data, credit blocks, delivery blocks, and billing blocks. You can display the number of issues with incomplete data and credit blocks, and the top 3 reasons for delivery blocks and billing blocks. You can use compact filters, visual filters, and charts to visualize your results, and a table from which you can navigate to resolve the issues.
Predicting delivery delay	You can gain insights into the current sales order fulfillment situation regarding the predicted delay of the planned delivery to the customer. It does this by focusing on the predicted delay of delivery creation and the predicted delivery processing delay. You can react proactively to avoid these delays, for example, by instantly recognizing issues and triggering the appropriate actions.
Tracking sales orders	You can check whether the delivery of a sales order is on track regarding its fulfillment. For example, you can see whether it has been shipped, invoiced, or even if a journal entry (that is, an accounting document) has been cleared. You can recognize immediately whether the fulfillment of a sales order contains issues or not, or whether it is completed or still in process. You can visualize the sales order fulfillment status, and display all relevant documents for the corresponding sales document. You can display further details on the business objects in the context of their fulfillment, including issues and the process flow, and resolve issues directly from here, for example, remove a delivery block.
Analyzing pricing elements	You can analyze pricing elements in billing documents (for example, to check current discount conditions and pricing strategies).
Checking confirmed sales orders, backorders, and demand fulfillment	You can check whether your sales orders have been confirmed for delivery on the date requested by your customer. You can identify backlogs in relation to your customer's requested quantity and delivery date. You can collaborate with your demand planner, for example, to solve issues regarding the availability of specific products.

Key Feature	Use
Monitoring delivery performance	You can monitor the current delivery performance of sales orders. You see the percentage of sales order items delivered as requested or delivered as committed for the last 3 weeks. You can compare the customer's requested delivery date or the committed delivery date of sales order items with the actual delivery date of the corresponding outbound deliveries and display this, for example, as the ratio of sales order items delivered as requested or delivered as committed to the total number of sales order items.
Analyzing sales volume	You can view sales volume and related billing document KPIs in a monthly rolling trend as a graphic or in a table with the display currency. You can drill down to view detailed information for selected sales organizations, sold-to parties, bill-to parties, and so on. You can filter the items according to various criteria, such as year/month, sales organization, sold-to party, and bill-to party.
Analyzing sales volume in detail	You can customize a step-by-step analysis path to drill down into your sales volume on different dimensions.
Checking sales volume and open sales	You can check your sales volume and open sales, that is, open orders, and open deliveries, in order to identify and resolve issues to increase your sales volume for the current month. You can navigate to analyze and resolve issues directly.
Checking sales volume and profit margin or credit memos	You can check the relationship between sales volume, profit margin, and credit memos, to help you to increase your sales volume.
Analyzing customer returns	You can analyze the monthly rolling trend of your customer returns based on flexible combinations of dimensions. You can analyze the return rate of your incoming sales orders.
Display an overview of sales data	You can get an overview of sales information, such as, customer returns, open sales quotations, and blocked credit memo requests.
Order-to-cash performance	You can check key figures to get an overview of the order-to-cash performance in your company. For example, you can track delivery blocks or billing blocks, detect changes made to critical fields of sales orders, and monitor lead times like order to delivery or goods issue to billing.
Displaying a sales management overview	You can get a graphical overview of various sales data as a sales manager.

Key Feature	Use
Data aging	The system moves your old sales data to the historical area of the database during data aging. When you analyze incoming sales orders, sales volume, and quotation conversion rates, the system uses current data only and does not retrieve historical data. **i Note** Please note that for customers using SAP S/4HANA Cloud, private edition, this feature might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

2.9.2.14 Integration

2.9.2.14.1 Sales Order Collaboration (Business Network Integration)

Business Background

SAP S/4HANA supports the integration with a business network or external system (for example, Ariba Network) to help automate the order-to-invoice process. You can do this by exchanging messages between SAP S/4HANA and the business network or external system.

Key Features

When a business network or external system (for example, Ariba Network) is integrated and supports the below named features, SAP S/4HANA enables you to use the following key features:

Key Feature	Use
Creating, updating, and canceling sales orders	You can receive messages from your buyers that use the business network or external system. In this case, SAP S/4HANA creates, changes, or cancels sales orders.
Sending confirmations	You can send sales order confirmations to your buyers that use the business network or external system.
Sending advanced shipping notifications	You can send advanced shipping notifications to your buyers that use the business network or external system.

Key Feature	Use
Sending customer invoices	You can send customer invoices to your buyers that use the business network or external system.

2.9.2.14.2 Self-Billing Collaboration

Business Background

SAP S/4HANA supports the integration with a billing solution (currently, SAP Self-Billing Cockpit) to help streamline and automate billing processes for suppliers.

Key Features

When a billing solution (currently, SAP Self-Billing Cockpit) is integrated and supports the below named features, SAP S/4HANA enables you as a supplier to manage billing-related documents in the self-billing process.

Key Feature	Use
Processing billing documents	You can manage billing documents based on self-billing documents that are processed in the billing solution. You can update invoices, create credit memos, and create debit memos.
Processing accounting documents	You can manage accounting documents based on self-billing documents that are processed in the billing solution. For example, you can update journal entries.

2.10 Service

2.10.1 Service Master Data and Agreement Management

2.10.1.1 Service Contract Management

Business Background

Service contracts represent long-term service agreements with customers. They define the content and scope of the services guaranteed within specific tolerance limits for certain parameters, for example, within a predefined timeframe.

In a service contract, you specify detailed information that has been agreed upon with the service recipient, such as the following:

- Routine tasks for devices that you have sold or let to customers
- Prices for the routine tasks
- Objects for which services can be claimed
- Conditions under which the contract can be canceled

Example

If a technical defect occurs in a customer's machine, they are assured that a service representative will be on site at the customer's place of business within four hours to correct the defect.

Key Features

The following table explains the key features available:

Key Feature	Use
Service contract processing	You can create service contracts and different types of service contract items and work with them throughout their entire life cycles. You can set up billing plans, adapt prices, and trigger the billing process for service contract items. You can renew service contract items if you would like them to be extended. You can cancel service contracts and service contract items.

Key Feature	Use
Billing plans	You can use periodic billing plans to schedule individual dates for the billing of service contracts, independent of the provisioning of the service. Periodic billing plans have a start and end date. They bill fixed (predetermined) amounts at regular intervals, for example, a recurring quarterly maintenance fee in a maintenance contract. You can use ad-hoc billing plans to flexibly define the dates on which billing is to occur and the value that is to be billed. You can schedule jobs for automatic creation of billing document requests based on the billing plans of released service contract items.
Change processes	You use this feature to make changes to existing service contracts. Each change process has different effects on the follow-on processing of service contracts, in both contract management and accounting.
Service contract determination	The system automatically searches for and displays service contract items that service orders can be assigned to.
Price adaptation	You can use the following methods to adapt prices if you require flexible pricing of service contract items: you can set a pricing date rule in the billing plan so that varying prices are determined according to varying pricing dates. Alternatively, you can set prices manually at billing request line level.
Price agreement	You can offer your customers individual prices, for example discounts for services and service parts, based on price agreements in service contracts. Prices from the price agreements are copied to the service orders that are assigned to service contracts after service contract determination.
Object list	You can enter objects (such as products, equipment, or functional locations) in the object list for which the contractual services defined in the service contract item can be claimed.
Product list	You can enter services and service parts in the product list of a service contract item. These services and service parts are included in the service product that is defined in the contract item and can be claimed in the course of subsequent service order processing with reference to a service contract.
Service level agreement (SLA)	You can define the attributes of service products (for example, maintenance or hotline) that you have agreed upon with your customers in service contracts. SLAs affect the pricing of services rendered for service contract items and the date calculation in service process, to which the relevant service contract items refer.
Maintenance plan	You can create service contract items for planned recurring services that are implemented by maintenance plans.

2.10.1.2 Service Agreement Management

2.10.1.2.1 Warranty Management

Business Background

Warranties define the scope of the services and parts usage that a company performs in the event of damage or problems. This process enables you to process service deliveries with automatic checks for warranty agreements.

Key Features

The following table explains the key features available:

Key Feature	Use
Define Service Scope	You can define the scope of services and usages that your company provides.
Carry Out Automatic Checks	You can automatically check the warranty when processing a customer message, a service or maintenance order, or a billing request. You use a warranty check to determine whether the warranty still exists, and if certain prerequisites have been met.
Product and Warranty Registration	You can create warranties and assign technical objects to those warranties.
Warranty Claim Processing	You can deal with a large number of warranty claims.

Key Feature	Use
Returns Management Processing	You can process customer returns. The process starts with a returns order with reference to the original sales order or invoice for the goods. A return material authorization (RMA) document is forwarded to the customer to be attached to the incoming goods. The goods are shipped back. A returns delivery is created with reference to the returns order, and the material is received into returns stock. The returns stock location is set as non-MRP relevant. The goods are inspected and either selected for return to stock, for scrapping, or for other logistical processing. A credit memo is created from the billing run and posted to the customer's account. Alternatively, a replacement delivery is triggered to compensate the customer.

2.10.1.3 Service Monitoring and Analytics

Business Background

You can use monitoring and analytics to obtain information on a range of key performance indicators for service contracts and service orders. You can also use analytics to address issues that are related to the fulfillment of service transactions.

Key Features

The following table explains the key features available:

Key Feature	Use
Service management overview	You can display overview information about expiring service contracts and the profit margins of service contracts. Additionally, you can display overview information on incomplete service orders, overdue service orders, and the average service duration for service orders. It is also possible to drill down into details of the key areas of service contracts.
Service contracts analysis	You can obtain information on key performance indicators for service contracts.

Key Feature	Use
Expiring service contracts analysis	You can obtain information on service contracts that have expired or are about to expire.
Service orders analysis	You can obtain information on incomplete service orders.
Overdue service orders analysis	You can obtain information on overdue service orders.

2.10.2 Service Operations and Processes

2.10.2.1 Service Order Management

Service Order Management enables you to manage your service life cycle, from creating and processing service order quotations through to creating and processing service orders and service confirmations.

For example, you can place customer service orders including technical details and prices. You can also plan the execution of services, including required service parts and perform follow-on processes such as monitoring and confirming of services.

Key Features

The following table explains the key features available:

Key Feature	Use
Service order templates	You can use service order templates to define reusable sets of service-related data that minimize the amount of time required to create a service transaction. A service order template describes only the scope of planned services and not the actual execution (customer and time frame).
Service order quotations	You can use service order quotations to provide customers with information about prices and delivery conditions before they place an order. Service order quotations are legally binding offers with fixed conditions.
Service orders	You can use service orders to record the details of a one-off service agreed upon by a service provider and a service recipient. Service orders contain all the information required to plan, execute, and bill for a service.
Service confirmations	Service confirmations allow you to report working time, service parts, and expenses used while performing a service.

2.10.2.2 Service Request Management

Business Background

Service request management enables you to monitor and fulfill requests for service by your customers.

Key Features

The following table explains the key features available:

Key Feature	Use
Service request templates	You can use service request templates to define reusable sets of service-related data that minimize the amount of time required to create a service transaction.
Service requests	You can use service requests to submit, dispatch, approve, monitor, and fulfill requests for services that originate either with your customers or internally. Service requests are user-related requests for a defined service or for a new service.
Incidents	You can use incidents to report events to the service desk when something in the infrastructure is not working as expected. An incident is an event that is not part of the standard operation of a service and that interrupts or reduces the quality of that service.
Case management	You can use case management to manage and process problems that involve multiple steps and processors. For more information see, Case Management [page 134].

2.10.2.2.1 Case Management

Business Background

Case Management enables you to consolidate, manage, and process information about a complex problem or issue in a central collection point, the case. Within a case, you can group information, such as business partners, transactions, products, and documents.

You can also use Case Management to process problems and issues that involve multiple processing steps or multiple processors. Case Management supports the processing and communication flow between organizational units which helps you to make processing more efficient.

Key Features

The following table explains the key features available:

Key Feature	Use
Case	You can use a case to group related objects in a central collection point that serves as a single point of access for processing an issue.
Case authorizations	You can use various authorizations to control user access to case information. You set up authorizations by defining values for authorization objects in authorization profiles and then assigning them to users or user groups using roles.
Multilevel categorization	You can assign cases to a category of a multilevel categorization schema called a reference category.

2.10.2.3 In-House Repair

Business Background

In-House Repair supports companies that offer repair and maintenance services for products. These services are provided in-house at repair centers.

The process includes activities for performing prechecks, processing repair quotations, planning repairs, performing repairs, and triggering billing for the repairs.

Key Features

The following table explains the key features available:

Key Feature	Use
Create in-house repair	You use this feature to create in-house repairs and then add repair objects.
Perform prechecks	You use this feature to decide whether an object is repaired,whether a repair quotation is created,or returned to the customer (without repair).
Process repair quotations	You use this feature to edit and send out repair quotations, and to record whether the customer has accepted or rejected the repair quotation.
Plan repair	You use this feature to schedule a repair and add the service employee who is to perform the repair.
Perform repair	You use this feature to perform the repair.

Key Feature	Use
Prepare for billing	You use this feature to trigger the billing process for the repair.

2.10.2.4 Planned Recurring Service

Business Background

You can use the planned recurring service to schedule and organize periodic services that occur repeatedly at certain intervals, such as regular maintenance, ahead of time. The planned recurring service helps you save costs resulting from unforeseen outages or breakdowns, to plan services in a better and more transparent way, and to schedule resources, like personnel or materials, more efficiently.

Key Features

The following table explains the key features available:

Key Feature	Use
Processing maintenance plans for planned recurring service	To plan recurrent maintenance service, you can create time-based and performance-based maintenance plans, and multiple-counter plans. In time-based maintenance planning, maintenance is performed in specific cycles, for example, every two months or every six months. With performance-based maintenance plans, you can plan regular maintenance based on counter readings maintained for measuring points of technical objects and products. • You can create and assign maintenance items that describe which maintenance service should take place regularly for a technical object/product or a group of technical objects/products. You can assign a service order template to the maintenance item to specify the individual service that must be executed and the spare parts required for the job. • You can determine the maintenance cycles as planning data. If the maintenance plan is performance-based, you can assign counters. Furthermore, you can specify other scheduling information, such as shift factors. • You can view the scheduled maintenance calls for the maintenance plan. When you schedule the maintenance plan and generate maintenance calls, the system generates maintenance call objects (service orders) for the due date and copies the relevant planning data into the call object. You can display the scheduled calls using the call history.

Key Feature	Use
Planning recurrent maintenance service with service order templates	Service order templates describe service activities which must be performed repeatedly for external customers. They contain important information about the spare parts required for the service. As a recurring service planner, you can use service order templates to standardize these recurring services more effectively. You can create a general service order template or a service order template for a specific piece of equipment, product, or functional location: • You can provide general information, such as the employee responsible and the status. You can also specify a validity period for a service order template. When you then assign a service order template to a maintenance item and the corresponding maintenance call is triggered, the system copies this service data from the service order template into the respective service order.

2.10.2.5 Customer Engagement

2.10.2.5.1 Interaction Center

Business Background

An interaction center (IC) is a customer service department within a company whose agents use various communication channels to handle inbound contacts, such as customer concerns, as well as outbound contacts.

IC agents can process business transactions, such as service orders, and can enhance their productivity, for example by using a knowledge search. All relevant account information is available to them in the IC.

Generally, the IC supports the following processes:

- Communication process
  This business process involves the communication between an IC agent and a business partner (customer, employee, and so on) in real time, for example, using the telephony channel.
- Interaction process
  The interaction process is the central IC process, which often encompasses the communication process and the business transaction process, and is performed whenever an agent uses the IC to communicate or interact – either directly with a business partner or asynchronously by working on a business transaction belonging to a business partner.
- Business transaction process
  Frequently an interaction will result in one or more follow-on business transactions, such as a service request. In such cases, each business transaction is linked to the interaction record, providing a connection between the business process and the interaction process.

Key Features

The following table explains the key features available:

Key Feature	Use
Business transactions	You can process supported business transactions in the IC.
Usage of communication channels	The IC supports various communication channels, such as phone, chat, e-mail, fax, and letter. Agents can handle inbound or outbound contacts. Please note that the channels must be provided by you, the IC only offers the integration option.
Account identification/account factsheet	You can use this IC function to identify accounts and to obtain an overview of an account and contact. Moreover, you can create and change accounts. Relevant account information is available to IC agents, such as account data, the service order status, and product-related information.
Interaction record	You can use this business transaction to store the information and data regarding the current interaction with an identified business partner.
Interaction history	You can use the interaction history to gain insights about past interactions with the confirmed account and about related business transactions. You can navigate from the interaction history to the relevant business transactions.
Activity clipboard	In the interaction record, the activity clipboard visualizes past and current interactions. In the navigation area, the activity clipboard visualizes current interactions. You can navigate to the objects that were created or changed during those interactions.
Agent inbox	You can use the inbox as a central worklist that the entire team can use to work on incoming objects. The inbox search provides a broad range of search attributes and search features that you can use to tailor the inbox search according to your business requirements. The inbox result list provides functions required to process the inbox items.
Business transaction routing	You can use this feature to forward business transactions in the IC, manually or automatically.
Alerts and messages	You can use this feature to display texts on the current pages of IC agents to alert them about items or situations that require their immediate attention.

Key Feature	Use
E-Mail Response Management System	You can use E-Mail Response Management System (ERMS) for managing large amounts of incoming e-mails. Instead of routing all incoming e-mails into one queue, ERMS provides services for automatically processing and organizing incoming e-mail.

2.10.3 Basic Functions

You can use a variety of selected generic tools, components, and features that support you in performing customer service tasks, including customer interaction.

Key Features

The following table explains the key features available:

Basic Function	Use
Partner processing	You can use partner processing to control how the system works with business partners in business transactions. Using partner determination, the system automatically finds and enters the partners involved in a transaction.
Date management	You can use date management to define dates and process them in documents.
Text management	You can use text management to define text objects and their text types which are the basic building blocks of text management within customer management applications.
Catalogs, codes and profiles	Catalogs are resources that help to ensure the uniform use of terms. Customer management uses a dual-level hierarchy comprising code groups and codes for catalogs.
Content management	You can use content management to enhance customer management business objects such as service orders with data such as documents, graphics, and multimedia objects.
Availability check	You can use the availability check (ATP check) to determine if a product in a sales item can be confirmed as available (enough stock is available or can be produced or purchased on time). The product is then reserved in the required quantity.

Basic Function	Use
Output determination	You can print, fax, and e-mail documents.
Actions	You can use actions to schedule and start predefined processes from transactions through user-definable conditions.
Multilevel categorization	You can use this to set up multilevel categorization for different applications. Multilevel categorization enables you to design categorization according to your business needs, and to integrate auto suggest functions and content analysis functions in your applications.
Rule modeler	You can use the rule modeler to create, maintain, and release rule policies.
Alert management	You can use alert management to enable on-screen notifications for agents to alert them to items or situations that require their immediate attention.
Data archiving	You can archive business transactions such as service orders and service confirmations that have been created using the appropriate archiving object.
Knowledge articles	Provides information that can be used to solve an issue. Interaction center agents can search for knowledge articles, which can include documents, links to websites, and screenshots, to answer customer queries.
Enterprise organizational management	You can use the enterprise organizational model in enterprise organizational management to directly access sales organizational structures from S/4HANA Sales. It also enables easy use of enterprise service organizations and service teams.

2.10.4 Workforce Management

Business Background

SAP S/4HANA supports the integration with a workforce management solution (currently SAP Field Service Management) to enable field service activities.

Key Features

When a workforce management solution (for example, SAP Field Service Management) is integrated and supports the features listed below, you can use SAP S/4HANA in field service scenarios.

The following table explains the key features available:

Key Feature	Use
Release a service order for scheduling and dispatch	By releasing a time and material-based service order, you replicate the service order to the workforce management solution for scheduling and dispatch.
Update a technician in the corresponding service order	If SAP S/4HANA receives data about the planned service technician, the information is automatically updated in the corresponding service order in SAP S/4HANA.
Create and complete a service confirmation	If SAP S/4HANA receives information about the completed tasks, a service confirmation is created and then completed automatically in SAP S/4HANA.
Complete service items in a service order	If a service confirmation is completed in SAP S/4HANA, the corresponding service item in the service order is completed automatically.
Complete a service order	When all service items in a service order are completed, the service order is completed automatically in SAP S/4HANA.

2.11 Sourcing and Procurement

Purchasing allows you to order direct materials, consumable materials, and services. The purchasing department keeps track of the procurement process with the purchase order, the goods and invoice receipts, and service entry sheets.

2.11.1 Generic Features Available in Sourcing and Procurement

Here, you can get an overview of the generic features that are available in Sourcing and Procurement.

Key Feature	Use
Using subcontracting documents	You can instruct a supplier (subcontractor) to manufacture materials using components provided by you. Based on the respective purchase order or scheduling agreement, you or a third-party supplier can send the components to your subcontractor, who then manufactures the ordered material. You can monitor the quantity of the needed components and trigger the goods issue, if required.

Key Feature	Use
Monitoring purchasing documents	You can monitor your purchasing documents (purchase requisitions, requests for quotations, purchase orders, scheduling agreements, and purchase contracts) by a requirement tracking number that you define.

2.11.2 Procurement Analytics

2.11.2.1 Real-Time Reporting and Monitoring

Business Background

The procurement overview provides you with a set of actionable cards that you can easily rearrange as required. You no longer need to start different transactions and reports separately: both operational and analytical cards are visible on one single page. You immediately see your most relevant tasks and can navigate to KPI drilldowns, worklists, or specific object pages to get more detailed information and take immediate action.

In addition, the monitoring of purchasing document items enables you to immediately assess and resolve critical situations for your company.

The supplier object page is enhanced by analytical real-time insights into supplier evaluation scores, purchase requisition types, as well as purchasing and off-contract spend.

Key Features

The following table explains the key features available:

Key Feature	Use
Operational cards	Examples of operational cards are the monitoring of contracts, so that you see which contracts are about to expire and require your attention, as well as purchase requisitions, showing you where a source of supply is missing and needs to be assigned. You can also monitor supplier confirmations that are overdue, or that deviate in quantity or delivery date from the purchase order.
Analytical cards	Examples of analytical cards are the actual and planned purchasing spend by supplier and material group, and the monitoring of the supplier performance by analyzing operational data and questionnaires.

Key Feature	Use
Filtering	You can filter the content of cards by various criteria, such as by suppliers, purchasing categories, material groups, and purchasing groups. This enables you to make informed decisions and take immediate action.
Monitoring	With the monitoring apps, you can identify the following, for example: • overdue purchase order and scheduling agreement items • missing supplier confirmations • request for quotation items for which no bids were submitted in time for the deadline • expiring purchase contract items • variances of material prices in purchase contracts and info records • request for quotation types • purchase requisition items • missing exchange rates for the currencies used in the analytical apps Apart from the regular filter and table section, analytical elements such as visual filters and analytical charts are also provided. These elements support users in immediately identifying the most critical business issues. From the monitoring apps, you can navigate to related apps to trigger follow-on actions, or perform the necessary action directly in the monitoring app (you can, for example, extend the validity of a contract or its target value). In addition to the KPIs, multi-dimensional reports for analyzing the purchasing spend as well as the service spend are available. Users can define dimensions, such as the plant or company code, and measures, such as the spend or the expected spend based on purchase order schedule lines, using drag and drop.
Schedule migration of purchasing data for analytics	Configuration experts can schedule jobs to migrate purchasing data such as purchase orders and scheduling agreements to improve the performance of analytical apps.

2.11.2.2 Spend Visibility

Business Background

The data that simplifies your daily work can be visualized in various chart types and by criteria such as supplier, purchasing group, purchasing category, or material group. The key performance indicators allow you to directly navigate into other apps, where you can immediately solve business issues.

Key Features

The following table explains the key features available:

Key Feature	Use
Purchase requisitions	Procurement organizations are measured according to their efficiency. Specifically in the area of managing purchase requisitions, you can notably increase the efficiency and automation of procurement processes. Key Performance Indicators (KPIs) help measure this efficiency and provide real-time insight into areas of improvement, such as the average approval time of a purchase requisition, or changes made to a purchase requisition item.
Purchasing and invoice spend	To identify cost-saving opportunities, it is essential that you see the purchasing and invoice spend under management. The available KPIs provide insight into purchase order value over time, future purchasing spend based on purchase requisitions that are currently in approval, purchasing spend classified by ABC suppliers, material groups and purchasing groups, invoices without purchase order reference, invoice price changes over time, and automation rates for sending purchase orders and receiving supplier invoices. You can, for example, retrieve the order value for all purchase orders over time, and determine all current values of all purchase orders in the system. Additionally, procurement dashboards for purchasing spend and off-contract spend in SAP Analytics Cloud can be accessed directly from SAP S/4HANA, showing purchasing data in real time.
Contracts and scheduling agreements	Purchasers can manage contracts efficiently and make sure that the right contracts are in place at the right time when needed. They are able to do so by identifying maverick spend and contracts that are not used, contracts that will expire soon, and contracts or scheduling agreements that are almost consumed by comparing target values or target quantities with released values or released quantities.

Key Feature	Use
Supplier evaluation	You can determine the overall score of a supplier in an organization based on the weighted average of the single scores for quantity variance, price variance, time variance, as well as quality scores based on inspection lots and quality notifications. Supplier evaluation scorecards that result from questionnaires enrich these operational supplier evaluation scores. A combined real-time view across operational and questionnaire-based scores provides a holistic view of your supplier's performance. You can also specify individual weighting and scoring factors per criterion and per purchasing category. You can also view the history of supplier evaluation scores. Additionally, you can send output messages (via email or print) with the supplier evaluation scores to the respective suppliers. Output scores can be based on dynamic real-time calculation or persisted historical scores. Define custom criteria based on your requirements in order to rate suppliers. Additionally, you can view the number of defective or rejected materials per million in relation to the goods received. This will help you to analyze the performance of a supplier as you can select a supplier with lower parts per million value for your future deals. You can also schedule jobs to persist the parts per million scores as a custom criterion to contribute towards the evaluation of a supplier. Additionally, a dashboard for supplier performance in SAP Analytics Cloud can be accessed directly from SAP S/4HANA, showing supplier evaluation scores in real time.

2.11.3 Sourcing and Contract Management

2.11.3.1 Purchase Contract Management

Business Background

You use the operational contract management solution when you wish to enter into long-term purchasing arrangements with suppliers regarding the supply of materials or the performance of services.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing purchase contracts	A purchase contract is an outline purchase agreement between the supplier and your company to procure special materials or services against which release orders (releases) can be posted. You can get an overview of all existing purchase contracts, where you can use various sorting and grouping functions. From the list of purchase contracts, you can directly renew a purchase contract and also see the validity status of each purchase contract. You can navigate into a specific purchase contract and process it. The purchase contract items view is enhanced by analytical real-time insights into release history, contract consumption, and contract leakage. When you purchase materials or services, you can assign a purchase contract item to several accounts. The prices and conditions from the purchase contract will be copied into the purchase order when referring to a purchase contract. A purchase contract can be maintained with a special validity time frame and a target quantity or a target value. When the target quantity or value you call off is exceeded, the system issues a warning. You can create a purchase contract template, which enables you to reuse data that is inherited from the template whenever you create a new purchase contract. This reduces both the time and effort you spend on filling out the data. You can create purchase orders directly from a purchase contract for any items covered by the purchase contract. You can withdraw a purchase contract from approval. You can then make the required changes in the purchase contract and submit it again for approval. You can use the flexible workflow to approve and review purchase contracts. The approval process of the flexible workflow can be either automatic, onestep, or multi-step. You can also define the deadline by which the workflow step should be completed, beyond which an overdue notice is sent to the approver.
Making mass changes to purchase contracts and monitoring them	You can select headers and items of purchase contracts and trigger a mass change for specific fields. You can then monitor these mass changes.

Key Feature	Use
Managing purchase scheduling agreements	Purchase scheduling agreements are a form of outline purchase agreement under which materials are procured on predetermined dates within a certain time period. Purchase scheduling agreements contain prices and conditions for a material item. Releases from a purchase scheduling agreement can occur using the MRP run, or release them manually, or you can plan purchase scheduling agreement releases as a background job. You can create and change purchase scheduling agreements as required, and maintain the delivery schedule. You can copy purchase scheduling agreement items. The newly copied purchase scheduling agreement item opens in the edit mode, where you can update and save the information based on your requirements. You can create and save purchase scheduling agreements as a draft, enabling you to temporarily save them for certain reasons, for example, if you need to double check and clarify certain details in the document. You can withdraw a purchase scheduling agreement from approval. You can then make the required changes in the purchase scheduling agreement and submit it again for approval. You can use the flexible workflow for purchase scheduling agreements with either the automatic, one-step, or multi-step approval. You can also define the deadline by which the workflow step should be completed. While using the flexible workflow, critical changes applied to an approved purchase scheduling agreement will retrigger the workflow based on the settings you make in the system.
Making mass changes to purchase scheduling agreements and monitoring them	You can select purchase scheduling agreement headers and items and trigger a mass change for specific fields. You can then monitor these mass changes.

2.11.3.2 Source Assignment

Business Background

You use the source assignment solution to identify potential sources of supply based on past purchase orders and existing long-term purchasing agreements. Sourcing enables you to find the most qualified and reliable suppliers, negotiate with them, and create both scheduling agreements and purchase contracts.

Key Features

The following table explains the key features available:

Key Feature	Use
Purchasing info record	A purchasing info record is a source of supply. The info record contains data about a specific material and its supplier. You can use an info record to define the prices and conditions at which you purchase a material from a specific supplier, for example. You can check how conditions in info records have developed over time, and flag an info record so that it is taken into consideration when a purchase requisition is created automatically during an MRP run. You can store information about a supplier and a material as master data at purchasing organization or plant level. You can create purchasing info records for different procurement types (standard, subcontracting, pipeline, and consignment). You can also display and analyze price history details and price variations of purchasing info records.
Making mass changes to purchasing info records and monitoring them	You can select purchasing info records and trigger a mass change for specific fields. You can then monitor these mass changes.
Source list	You can define which sources of supply are valid for usage in an MRP run through the source list. Depending on the material or plant, you can use the source list to automatically assign an info record, a scheduling agreement item, or a purchase contract item to be used as the source of supply.
Quota arrangement	You can use quota arrangements to split up a specific material requirement for a plant to several sources of supply, that is, to several suppliers. This allows you to minimize the risk of delivery failures for important materials.

Key Feature	Use
Requests for quotations	If you do not have a valid source of supply, you can use the requests for quotations process to find one. A request for quotation is a request from a purchasing organization to a supplier to submit a quotation for the supply of materials or lean services. You can create requests for quotations and maintain general information and attributes such as the purchasing organization, delivery terms, delivery address for single items, and deadlines. You can also add attachments. If you want your strategic buyers to invite suppliers to place bids, you can send the request for quotation (including attachments) to an external procurement system, for example, SAP Ariba Sourcing. (Note: The use of SAP Ariba Sourcing may require a separate license.) After the suppliers have placed their bids in the external procurement system, strategic buyers can award bids and send them to SAP S/4HANA, where you can check the detailed information of the awarded quotations. In the external procurement system, you can select whether a contract or a purchase order should be created for the selected quotation. Alternatively, if you just want to request only price and quantity information or shipping costs, the request (including attachments) can be sent to a business network (for example, Ariba Network) after you publish it. Suppliers can create their bids directly on the business network and send them back to SAP S/4HANA, where you can award one of them. You can also create price requests in SAP S/4HANA and send them directly to your supplier via e-mail or as a printed version by mail. You receive the quotations from the suppliers and can manually create and award them in SAP S/4HANA. In all three cases, RFQ items can be selected for an info record update, which means that the prices from the most recent bids are transferred to the corresponding info record. You can define approval rules for RFQs. These rules are applied during the awarding process.

Key Feature	Use
Supplier quotations	A supplier quotation is an offer from a supplier to a purchasing organization to supply materials or lean services. In SAP S/4HANA, supplier quotations can be created in one of the following ways: • They can be generated from awards from an external pcourement system (for example, SAP Ariba Sourcing) that are transferred to SAP S/4HANA via a business network (for example, Ariba Network). • If you have requested price information and suppliers have submitted their bids directly on the business network, the questions are created in SAP S/4HANA. You can then award the quotations in SAP S/4HANA. Quotations that have not yet been awarded can still be manually changed in SAP S/4HANA. • You can create supplier quotations manually in SAP S/4HANA. • You can define approval rules for supplier quotations. These rules are applied during the awarding process in SAP S/4HANA. • You can display awarded quotations and all relevant detailed information. • Depending on the type of the preceding document, the follow-on documents based on the awarded quotations can be created either manually from the UI or automatically in the background, and can then be processed further.
Comparing Supplier Quotations	You can select up to three supplier quotations and compare them simultaneously in a separate screen. To cover your demand for goods and services at the best price, you can either award one quotation completely, or partially award several quotations.
Situation Handling	You can inform specific members in your purchasing organization about the approaching submission deadline for an RFQ and that only a low number of supplier quotations has been received.

2.11.4 Operational Procurement

2.11.4.1 Self-Service Requisitioning

Business Background

Self-service requisitioning allows you to create, manage, and track your orders efficiently. You can create items from external catalogs and free-text items. After ordering the products you require, an item or header-based approval process is triggered. Once your purchase requisition has been approved, a purchase order is created.

Key Features

The following table explains the key features available:

Key Feature	Use
Defining default settings for users	For each user, you can maintain default values for fields that are used when the user creates a purchase requisition.
Selecting products	You can order products by selecting them from catalogs, by entering a free-text item, or by selecting a product ID from the product master. The system automatically checks that the most recent price for any product you want to purchase is chosen when you place your order. You can also define a value limit for unplanned services or materials, that is, materials and services that cannot be specified in detail at the time of ordering, by creating a purchase requisition limit item. Based on the settings made in the system, the appropriate purchasing groups are automatically proposed.
Copying purchase requisitions	You can copy an existing purchase requisition. All the items will be copied, along with their attachments, irrespective of the status of the items; provided you have access to the catalogs. You can view supporting information while copying rejected purchase requisitions or rejected purchase requisition items.
Searching and filtering purchase requisitions	You can search and filter the requisition list to view a specific purchase requisition or a set of purchase requisitions. You can view the status and the number of items in the purchase requisition, with a quick summary of key item information.
Using the approval process and monitoring your requisitions	You can use the flexible workflow for purchase requisitions, enabling you to optimize the approval process. The flexible workflow allows you to use either the automatic, one-step, or multi-step approval. From the overview of all requisitions they are responsible for, approvers can either approve or reject them, and add comments, if required. Based on the workflow configuration, approvers can also send back purchase requisitions to requestors for rework. You will be notified if your purchase requisition has been rejected or sent back to you for rework. In case of purchase requisitions that have been sent back for rework, you can read the comments from the approver, make the required changes and resubmit the requisition. You can monitor the status of all your requisitions to see who is responsible for an approval step. For purchase requisitions that were originally created in an external system, the status also reflects the external processing status.
Adding, copying, modifying, and deleting items in existing purchase requisitions	You can add, modify, copy and delete items within an existing purchase requisition, provided that no follow-on document has been created.
Purchase order processing	Once the purchase requisition has been approved, a follow-on document is created and submitted to the supplier.

Key Feature	Use
Confirmation processing	After you have received the products you have requested, you can confirm the delivery.
Situation handling	You can receive notifications about overdue confirmations for your deliveries.
Return delivery processing	If you need to return products after you have confirmed the delivery, for example because they are damaged or due to poor quality, the return delivery process is available.
Shopping on behalf of other users	Employees can also shop on behalf of other users, for example a team assistant can procure an item on behalf of the manager. You can also restrict the group of users on behalf of whom an employee can shop.
Managing catalog items	You can see which catalogs are assigned to your users, and also which items are part of which catalog.

2.11.4.2 Requirements Processing

Business Background

A purchase requisition is a request to procure a certain quantity of a material, or a service, so that it is available at a certain point in time. A purchase requisition is used as the starting point in purchasing and may be created manually. A demand from an MRP run, for example, can also result in a purchase requisition. A purchase requisition may be subject to either a release strategy or can trigger an approval process based on the flexible workflow.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing purchase requisitions	Purchasers or other specialists can create purchase requisitions manually. Purchasers can also create purchase requisitions using catalog items for which a price validation can be activated. In this case, they receive the most recent information about the price of the catalog item. The price entered in such purchase requisitions can also be transferred to the follow-on purchase orders. You can assign a source of supply from the proposed possible sources of supply, or you can manually assign a supplier. When you purchase materials or services, you can specify an account assignment. You can also view a table of commitments of purchase requisition items whose account assignment is commitment-relevant. You can define a value limit for unplanned services or materials, that is, materials and services that cannot be specified in detail at the time of ordering, by creating a purchase requisition limit item. Purchasers can also modify self-service requisitions. You can also implement an approval process using the flexible workflow for purchase requisitions. You can determine the approver using responsibility management. You can assign a source of supply to the items in a purchase requisition and process them. If no source of supply is available in the system or if several potential sources of supply exist, you can also create a request for quotation to find the most suitable supplier. You can optimize the purchasing process by bundling several purchase requisitions into one purchase order. Alternatively, you can also create a purchase contract if required. If the sources of supply are assigned, you can also plan the automatic creation of purchase orders from requisitions as a background job. Embedded analytics help suppliers to find the best possible source of supply. If no suitable source of supply exists, you can create a request for quotation and send it to Ariba Sourcing. You can create a list of purchase requisitions based on different attributes, such as the supplier, a material, or an account assignment.
Making mass changes to purchase requisitions and monitoring them	You can select purchase requisitions and trigger a mass change for specific fields. You can then monitor these mass changes.

Key Feature	Use
Using the approval workflow	You can use the flexible workflow for purchase requisitions with either the automatic, one-step, or multi-step approval process. As a configuration expert, you can add approvers and reviewers as recipients of workflow items. You can define recipients using either a role or a user-based assignment. You can also mark a workflow step as optional to automatically skip and move to the next step, when an approver cannot be determined. You can also choose to exclude restricted agents from being approvers of purchase requisition. As a reviewer, you can monitor the progress of the workflow. As an approver, you can get an overview of all the purchase requisitions you are responsible for. You can approve or reject purchase requisitions and add comments. Based on the workflow configuration, you can also send back purchase requisitions to requestors for rework. As a purchaser, you can view the approval details of a purchase requisition. In Create/Edit mode, the approval details provide a preview of the possible approval steps based on the workflow configuration. In Display mode, the approval details show the actual approval steps with the current status. The review steps, if any, are also displayed. You will be notified in case your purchase requisition has been rejected or sent back to you for rework. In case of purchase requisitions that have been sent back for rework, you can read the comments from the approver, make the required changes, and resubmit the requisition.
Situation handling	When a contract is created that can be assigned to an existing open purchase requisition, the system notifies the purchaser responsible for the purchase requisition and asks whether the contract should be assigned. For more information on how to determine the purchaser responsible, see Responsibility Management [page 221] .
Edit purchase requisitions before approving them	As an approver, you can partially edit specific purchase requisitions before approving them or sending them back for rework. You can also add notes and attachments to purchase requisitons before approving them or sending them back for rework.

2.11.4.3 Purchase Order Processing

Business Background

A purchase order is a request or instruction to an external supplier to deliver a specific quantity of material at a certain point in time, or to perform services within a specific period.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing purchase orders	When you create a purchase order, you can base it on a purchase requisition, or use an existing purchase order, an info record, or a contract as a reference. The purchase order can, for example, contain different delivery dates, account assignments, texts, and partners. When you use a contract reference, a contract call-off is initiated. You can also create a new purchase order from scratch. You can change purchase order data depending on the existence of follow-on documents, such as a goods receipt, or an invoice. You can assign newly created purchase orders to your own document types copied from the sstandard document type. When you purchase materials or services, you can base the account assignment on internal orders and cost centers, for example, and assign a purchase order item to several accounts. If you want to order a specific material or service for which the account assignment is unknown, you can leave the account assignment empty and enter the details during service entry sheet processing. You can purchase materials or services, using product master data or create free-text items without master data. You can request a specific service performer, and you can create limit items when procuring services. You can also define limits both for unplanned materials and unplanned services. Once the services have been performed, their exact price and quantity must be recorded in the service entry sheet. You can also create a free-text item that defines a limit for unplanned materials. For limit items for unplanned materials you post the invoice immediately, without creating a goods receipt document. You can see whether or not a purchase order is relevant for Intrastat reporting. You can use the checks related to International Trade Compliance [page 49]. You can list purchase orders based on attributes such as the supplier, a material, or a plant. You can use Evaluated Receipt Settlement (ERS). You can use the features provided by Budget Availability Control. You can predict whether the delivery of a purchase order will happen on time or not. For delayed deliveries you can take the appropriate action.

Key Feature	Use
Using the approval process	You can use the flexible workflow for purchase orders with either the automatic, one-step, or multi-step approval. You can approve or reject purchase orders. You can forward approval items and add comments and attachments, and you can withdraw a workflow item from approval if you have the required authorization. All purchase orders that you need to approve or reject are automatically visible for you. Whether or not a purchase order needs to be approved or whether it is released automatically depends on the settings that were made during the workflow configuration process. You can see the details and status of approval items. While using the flexible workflow, critical changes aplied to an approved purchase order will retrigger the workflow based on the settings you make in the system.
Managing price history details of purchase orders	You can display and analyze price history details and price variations of purchase orders.
Making mass changes to purchase orders and monitoring them	You can select purchase orders, purchase order items, and schedule lines to trigger a mass change for specific values. You can then monitor these mass changes. You can also simulate the changes first and then monitor them, using simulated jobs or mass change jobs.
Monitoring follow-on processes	You can check the status of supplier confirmations as well as the status of created goods receipts and supplier invoices. You can also check the status of purchase order items and get a prediction on whether the delivery of these purchase order items will happen earlier than scheduled, on time, or with a delay.
Situation handling	If a purchase order is created for which a confirmation is expected, the system sends a notification to the purchaser who created the purchase order. The notification is sent 5 days before the confirmation date. You can inform specific members in your purchasing organization if a purchase order has missing supplier confirmations or if there is a deficit in the quantity of materials to be delivered by the supplier.
Output management	You can use output management to print or email purchase orders.

2.11.4.4 Purchase Order Collaboration

Business Background

SAP S/4HANA supports the integration with business networks (Ariba Network, for example) or external systems to enable you to collaborate with your suppliers on purchase orders.

Key Features

If a business network (Ariba Network, for example) or external system is integrated and supports the features listed below, SAP S/4HANA enables you to use the following key features:

Key Feature	Use
Sending purchase orders	You can send purchase orders as well as changes to purchase orders or cancellations from SAP S/4HANA to the business network or external system. The following item categories are supported: • Standard items • Limit items • Third-party items • Service items (for external services) Purchase orders can be transferred, including attachments they have at header level.
Receiving confirmations	You can receive purchase order confirmations from your suppliers using the business network or external system.
Receiving service entry sheets (for external services)	You can receive service entry sheets from your suppliers. In SAP S/4HANA, you can approve or reject them. The status can be transferred to the business network or external system. Once a service entry sheet has been approved, suppliers can create an invoice for the external services.
Receiving advanced shipping notifications	You can receive advanced shipping notifications from your suppliers using the business network or external system, which creates inbound deliveries in SAP S/4HANA.
Sending goods receipts (for materials)	You can send goods receipts to your suppliers using the business network or external system to inform them that you have received material items, and to let them know whether a part of the delivery or the full delivery has been received.

2.11.4.5 Service Purchasing and Recording

Business Background

In addition to their own workforce, many companies employ external service providers. Depending on the nature and the complexity of the services and of the related processes, you can choose either external services or lean services to best meet your business requirements.

Key Features

The following table explains the key features available:

Key Feature	Use
Purchasing services	You can use service purchasing for a wide range of services, such as planned and unplanned maintenance and construction or consulting services. When you request services from your suppliers, you can specify all the services that may be procured in detail or you can just set a limit in the purchase order using a contract for the price definition. It is possible to do the cost assignment at a later point in time.
Entry of services actually performed	You enter services that have actually been performed by means of service entry sheets. In doing so, you reference the purchase order. Each individual service is recorded together with quantities and values. If a value limit for unplanned services has been set in the purchase order, you can maintain specifications for such services at the time you record their actual performance and select a contract item in which the price per unit is defined. The services are recorded with their precise value, and the system checks that the limit has not been exceeded. Tax information defined in the purchase order can be displayed and edited in the service entry sheet. Detailed pricing information is displayed for service items. You can also add attachments to the service entry sheet.
Acceptance of services performed (available for external services)	After you have recorded the services that have been performed in the service entry sheet, the persons responsible can check that the work is satisfactory and formally accept the services.
Approving service entry sheets (available for lean services)	For the approval or rejection of service entry sheets, you can use in your system either the flexible workflow or the classic workflow: If you use the classic workflow for service entry sheets, you can define one approver for each service entry sheet. The flexible workflow allows you to define one or more approvers and to use either the automatic, one-step, or multi-step approval. You can approve or reject service entry sheets, withdraw a service entry sheet from approval, or revoke the approval of a service entry sheet under certain conditions.
Verification of invoices for services	In the final step, you ensure that the service provider's invoices are correct.

2.11.5 Invoice Management

2.11.5.1 Invoice Processing

Business Background

The invoice processing follows the processes of purchase order and goods receipt.

A supplier invoice is a document from a supplier for materials that were delivered or services that were performed. You can create a supplier invoice manually. The invoice verification checks the supplier invoice for accuracy with regard to content, price, and accounting.

You can search for supplier invoices depending on the status, and you can release blocked invoice items. When you post the invoice, the data from the supplier invoice is saved in the system and both an invoice document and an accounting document are generated.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing supplier invoices	You create a supplier invoice after receiving the invoice from the supplier. You can create the supplier invoice with reference to a purchase order or without any reference. You can select the reference purchase order using the corresponding delivery note or service entry sheet, for example. The invoice verification checks the supplier invoice for correctness. Before posting the document, you can simulate the supplier invoice in order to display the account movements. In addition, one clerk can park the invoice document and another clerk can complete the process and post it. When the invoice reduction functionality is used during the creation of an invoice, output management is triggered to inform the supplier. You can schedule the output as a regular job. In supplier invoices, you can also process down payments that originate from a Central Finance system. Relevant for China: The integration of supplier invoice verification with the *Golden Tax System* (GTS) is supported.
Managing supplier invoices with reference to purchase order limit items	You can post a supplier invoice to a purchase order limit item that defines a value limit either for unplanned materials or for unplanned services. In this case, you check the invoice amount directly against the value limit.
Working with supplier invoice lists	You can search for supplier invoices and use the search result as a supplier invoice worklist that allows you to display the detail data. For example, you can display a list of blocked supplier invoices and release or reverse them.

Key Feature	Use
Releasing supplier invoices	If you want to release invoices manually, you can select the blocked invoices using different filters. Invoices can also be released automatically. In this case, the system checks each blocking reason to see whether it is still valid.
Approving supplier invoices	You can display supplier invoices that are assigned to you by workflow. You can approve or reject the corresponding work item. If necessary, you can forward a work item to a different employee for further processing. You can use the workflow, for example, to approve posted supplier invoices that are blocked for payment. You can also define time frames in which a workflow step must be completed. For overdue deadlines, you can set up pre-defined email notifications.
Working with goods receipt and invoice receipt clearing accounts	You can maintain goods receipt and invoice receipt clearing accounts, and cancel the created documents if required.
Consignment and pipeline settlement	For goods withdrawals from consignment stocks or from a pipeline, you do not expect an invoice from the supplier. Instead you can settle posted withdrawals and return deliveries yourself and send the supplier a statement of the settlement.
Supplier invoice jobs	You can schedule and monitor recurring, supplier invoice related activities as a background job. For example, you can choose the job template *Evaluated Receipt Settlement*.
Down payment monitoring for purchase orders	You can monitor purchase orders for which a down payment is planned. Furthermore, you can create down payment requests. If down payment data is maintained in the purchase order, you can post down payment requests and down payments for this purchase order. When you enter an incoming invoice, you can select the down payments and post the down payment clearing documents together with the invoice document.

2.11.5.2 Invoice Collaboration

Business Background

SAP S/4HANA supports the integration with business networks (Ariba Network, for example) or external systems to enable you to collaborate with your suppliers on invoices.

Key Features

If the business network (Ariba Network, for example) or external system is integrated and supports the features listed below, SAP S/4HANA enables you to use the following key features:

Key Feature	Use
Receiving supplier invoices	You can receive supplier invoices from your suppliers using the business network or external system. The message transferring the invoice data can also transfer a PDF version of the invoice or other attachments. Error-free invoices can be posted automatically in SAP S/4HANA. Invoices with errors can be saved with errors and can later be processed manually.
Sending supplier invoices	You can transfer supplier invoices created in SAP S/4HANA to your suppliers using the business network or external system. Such invoices are sent for status tracking and follow-on processes.
Sending status updates for invoices	Status updates for the received invoices invoices can be sent to your suppliers via the business network or external system. For example, when an invoice is posted, paid, reversed, or when a blocked invoice is released in SAP S/4HANA, a status update is sent. You can also transfer status updates for invoices that you have created in SAP S/4HANA.

Related Information

Dynamic Discounting (Business Network Integration) [page 40]
Payment Advice Collaboration (Business Network Integration) [page 41]

2.11.6 Supplier Management

2.11.6.1 Classification and Segmentation

Business Background

Supplier classification and segmentation is an ongoing process in which you assess and classify your suppliers at regular intervals and allocate your suppliers to segments of different importance. You can then focus especially on those suppliers that are strategically important and critical to your business, thus enabling you to develop and manage your business relationships.

Key Features

The following table explains the key features available:

Key Feature	Use
Purchasing Category	Purchasing categories allow you to manage your suppliers according to specific categories of goods and services, for example, hardware and software, or installation and maintenance. They enable you to monitor your pool of suppliers and optimize the purchasing process. Purchasing categories are also an important structuring element in the supplier evaluation process. They enable you to compare the evaluations of all suppliers in the same purchasing category.
Procurement-Related Activities	To drive and organize procurement-related activities, your buyers can use the procurement activity management process.
Supplier Data	You have a central overview of the master data of each supplier, such as address details, contact person, bank and tax data. The classification details enable you to assign important characteristics to your suppliers, such as the strategic importance (*ABC classification*) and the relationship you have with a supplier (for example *preferred supplier*). A scorecard for each supplier enables you to monitor the supplier's corporate social responsibility compliance. If your company has a contract with D&B, you can display the D&B data of the supplier.

2.11.6.2 Supplier Evaluation

Business Background

You can evaluate your company's suppliers to obtain a basis for your business relationship with them and for optimizing your supply base.

Key Features

The following table explains the key features available:

Key Feature	Use
Supplier Evaluation	In supplier evaluation, you send out supplier evaluation requests to appraisers, asking them to fill out questionnaires about a supplier. You first create the questions and the corresponding answer options and then include the questions in one or several questionnaires. You can include the questionnaires in evaluation templates that serve as the basis for sending out evaluation requests. You create questions in the question library. For a better overview, you can use sections to structure the questions. You can display the evaluation scorecards that show the overall result of a supplier evaluation for one supplier.

See also the key feature *Supplier Evaluation* under Spend Visibility [page 143]

2.12 Supply Chain

2.12.1 Inventory

2.12.1.1 Goods Movement

Business Background

Even in a computer-supported inventory management system, the accepted accounting principle of no posting without a document applies. According to the document principle, a document must be generated and stored in the system for every transaction/event that causes a change in stock.

Goods Issue

- Goods issue features enable you to post goods movements that lead to a reduction in warehouse stock.
- Goods issue postings are mainly performed by employees managing the company's stocks at plant and storage location level.

Goods Receipt

- Goods receipt features enable you to post goods movements that lead to an increase in warehouse stock.
- Goods receipt postings are mainly performed by employees managing the company's stocks at plant and storage location level.

Reservations

- Create and manage reservations at plant level, storage location level, or batch level to ensure the availability of materials for planned goods movements.

For further inventory management features, see *Inventory Analytics and Control*.

Key Features

The following table explains the key features available:

Key Feature	Use
Posting goods issues	This feature allows you to post, for example, the following goods movements by generating corresponding material documents: • Goods issues A goods movement with which a material withdrawal or material issue, a material consumption, or a shipment of goods to a customer is posted. A goods issue leads to a reduction in warehouse stock. • Scrapping A posting in the inventory management system made if a material can no longer be used. • Return delivery A delivery returning goods to the supplier for some reason (for example, due to poor quality or because they are damaged), even if the goods receipt has already been posted. If the supplier sends a substitute delivery, the return delivery can be referenced to the goods receipt.
Posting goods receipts	This feature allows you to post, for example, the following goods movements by generating corresponding material documents: • Initial entry of stock balances An operation performed once at the start of the productive life of the system in which physical stocks on hand or book inventory balances from a legacy system are recorded as opening book balances. • Goods receipts A goods movement with which the receipt of goods from a supplier or from production is posted. A goods receipt leads to an increase in warehouse stock.
Transfer posting and stock transfer	This feature enables you to perform stock transfers from one storage location to another storage location as well as changes in stock type or stock category of a material. It is irrelevant whether the posting occurs in conjunction with a physical movement or not. Stock transfers can occur either within the same plant or between two plants.
Reservations	This feature enables you to make a request to the warehouse to keep materials ready for withdrawal at a later date and for a certain purpose. The purpose of a reservation is to ensure that a material will be available when it is needed. This simplifies and accelerates the goods movements process. A reservation for goods issue can be requested by various departments for various account assignment objects (such as cost center, order, asset, etc.). A reservation can be taken into account by material requirements planning, which means that required materials are procured in time if they are out of stock.

2.12.1.2 Inventory Analytics and Control

Business Background

Inventory Analytics and Control covers the following inventory management tasks:

- Evaluating and displaying of documents (for example, material documents) and stock information
- Checking reports and analysis reports

Inventory management is mainly performed by employees managing the company's stocks at plant and storage location level.

For posting goods issue and goods receipt, see *Goods Movement*.

Key Features

The following features are available:

Key Feature	Use
CWM	This feature allows you to create CW materials. Goods movements and stocks of CW materials are processed in two quantities with a variable proportion. The base quantity of CW materials is used to operate the logistics of a process, while the parallel quantity is used to valuate the goods movements and stocks. This allows you to define logistic quantities and inventory values based on different properties of a material. This feature enables you to work with a CW material that has two units of measure for warehouse stock as well as for material movements: the base unit of measure and the parallel unit of measure for valuation determination. The purpose of a separate valuation unit of measure is to ensure that a material can be managed with one quantity influencing the valuated stock and another quantity having no impact on the valuated stock. For example, a CW material uses pieces and kilograms. The quantity in kilograms determines the valuated stock, but this is independent of the number of pieces involved. This feature supports requirements of specific industry sectors, such as the food processing industry, that need a separate valuation unit of measure.

Key Feature	Use
Reporting	The reporting feature includes a range of functions and reports that provide extensive information on all materials and their stock data: Reports to evaluate and display, for example, the following documents: • Material documents • Material documents for which at least one reason for movement has been specified • Accounting documents available for a selected material • Sales documents that contain a specific batch of a material Reports to evaluate and display, for example, the following stock information: • Total stocks of given materials at plant and storage location level • Stock in transit • Stock situation of a given material in selected plants including consumption statistics and current stock/requirements list • Vendor consignment stocks • Consignment and returnable packaging stocks at customer's site • Stock in a particular time period • Remaining shelf life of batches • Valuated sales order stock and valuated project stock • Stock that is made available to the supplier (subcontractor) and stored on the supplier's premises but remains the property of your enterprise • Total stock quantity and the total stock value for a material at plant and storage location level Check reports and analysis reports, for example: • Comparison of goods receipt quantities and values relating to a purchase order with invoice quantities and values for the same purchase order • Analysis of rounding differences that resulted from conversion between units of entry and base units • Analyzing average stock value and inventory turnover within a specific time period • Displaying and deleting data that you have held for further processing but not yet posted • Identifying overdue stock transfers • Identifying overdue materials that were already posted into the non-valuated goods receipt (GR) blocked stock • Identifying slow or non-moving materials
Period closing	Goods movements are managed by period. For goods movements to be posted to the correct period, you set the correct period whenever a new period starts.
Displaying price change documents	This feature allows you to display price change documents that specify the valuation price of materials.

Key Feature	Use
Monitoring and adjusting inventory process tasks	You have various options for monitoring and adjusting inventory processes supporting day–to–day tasks based on for example recent inventory counts, warehouse throughput history, or outbound delivery lists.
Analyzing and evaluating inventory management Key Performance Indicators (KPIs)	You have various options for analyzing and evaluating inventory management processes based on for example stock value by stock type, warehouse throughput history, or overdue materials. In addition, you can monitor KPIs effectively to ensure forecast and inventory accuracy in a timely manner and visualize this in a meaningful way. You can identify critical KPIs to monitor the inventory flow or investigate potential problems.
Ensuring forecast and inventory accuracy	You have various options for collecting and evaluating data in order to create business inventory analytics as well as to derive trends and provide recommendations for senior management. You can, for example, monitor stock aging in order to potentially adjust inventory levels to minimize fixed capital.
Predictive analysis on transfer posting	You can use this feature to perform predictive analysis with a proposed delivery date for a stock transport order. This analysis gives you a statistically-based forecast if a goods receipt can be successfully completed in time.
Output processing	A physical goods movement generally requires a document in printed form, for example, to serve as a transfer document (goods receipt slip, goods issue slip) for the warehouse or as a label for identification of the material (pallet slip). This feature enables you to generate corresponding documents and to specify that the output is printed or that it is produced and sent by other means, for example by e-mail.

2.12.1.3 Physical Inventory

Business Background

Physical Inventory covers the following inventory management tasks to support the recording of actual stock levels (quantities) of materials:

- Performance of physical inventory (stocktaking) and stock adjustments both for a company's own stock and for special stocks on periodical basis

For further inventory management features, see *Inventory Analytics and Control*.

Key Features

The following table explains the key features available:

Key Feature	Use
Physical inventory / inventory count and adjustment	This feature allows you to perform the periodic process of making necessary adjustments to stock on hand after a physical count. The benefits are: • Transparent view on the stocks currently available • Efficient processing of inventory adjustments (including initial counts and recounts) • Device integration for physical inventory counting; for example, by using barcode scanner The process begins with the generation of the required inventory count sheets. Materials can be blocked here for posting during the physical inventory. Once the inventory sheets are printed out, the actual physical inventory count is realized for the given materials. Afterwards, the count result is entered in the system and then any discrepancies against the system quantities are reviewed. The inventory may be recounted until final counts are accepted and inventory differences are posted. In addition, this feature enables you to perform the following physical inventory procedures: • Sample-based physical inventory The sample to be inventoried is determined on a mathematical-statistical basis. A physical inventory count and an inventory adjustment posting are performed for the items in the sample. Based on the inventory adjustment posting, an extrapolation provides an estimated value for the entire stock. If the extrapolation is successful, it is assumed that the book inventory is correct. Note that the sample-based physical inventory is not available for EWM-managed storage locations. • Cycle Counting The materials to be inventoried are counted at regular intervals during a fiscal year. You can use the cycle counting approach, for example, to ensure that stocks of fast-moving items are checked more frequently than slow-moving items.

2.12.1.4 Returnable Packaging

2.12.1.4.1 Returnable Packaging Logistics

Business Background

Returnable packaging logistics enables you to manage the exchange of reusable packaging materials with business partners, either as empties or as part of packages when delivering goods.

As a company owning returnable packaging materials exchanged with business partners, you need to keep track of the stock of those packaging materials at each business partner. You could create account statements and send these to your business partners for verification. With postings to returnable packaging accounts, the stock exchange of returnable packaging materials between your company's locations and your business partners could be documented, resulting in an overall balance for each of the accounts.

As a company exchanging returnable packaging materials with business partners owning them, you want to keep track of the stock of those packaging materials at your locations. You could receive account statements from these business partners and match the statement postings with your own account postings.

Key Features

The following features are available:

Key Feature	Use
Managing returnable packaging accounts	You define returnable packaging accounts for packaging materials and their specific exchange relationships of location (such as your plant) and exchange partners (such as suppliers or customers). Each account shows the current balance based on the quantities exchanged between the account location and the exchange partners using returnable packaging account postings. For each returnable packaging account, you could control whether account statements are sent or received.
Postings to returnable packaging accounts	You could post to returnable packaging accounts automatically or manually. Goods movements in inventory management to returnable packaging materials involving your plant and the exchange partner could be used, for example, to trigger an automated returnable packaging account posting in the background. You could create manual postings to returnable packaging accounts for movements that do not involve inventory management of your plants or where the inventory management posting does not include the exchange partner.

Key Feature	Use
Managing statements to returnable packaging accounts	You manage returnable packaging account statements either by creating account statements based on your account postings and sending those to your exchange partners or by receiving account statements from your business partners and matching those automatically or manually with your own account postings.
Ordering returnable packaging materials	You could order empty returnable packaging materials to be replenished by your exchange partner using consumption-based planning processes.
Evaluations/Monitoring	You could use various reports to get an overview on: • Returnable packaging accounts and their balances • Returnable packaging account postings • Returnable packaging account statements

2.12.1.4.2 Recycling Administration

Business Background

In many countries/regions, environmental law obliges companies to provide certification to account for the packaging materials produced and the number of finished products manufactured and brought to the market, and to collect and dispose of these materials and products at the end of the product life cycle. These kinds of regulations, along with an increased public awareness of environmental issues, provides companies today with new challenges.

In addition to the standard manufacture and sale of products, companies are often now responsible for the correct disposal and recycling of their waste products. Most companies absolve themselves of the duty to perform these tasks themselves by collaborating with recycling partners, who provide a general collection system in return for a license fee. The recycling partners organize the collection, sorting, processing, and recycling of the waste packaging.

The focus of the recycling administration features is the item-based or weight-based fee calculation for specific materials, as well as end-to-end transparency and implementation of the reporting of environmental requirements. A set of example templates is available to be used to implement the reporting requirements of recycling partners.

Key Features

The following features are available:

Key Feature	Use
Determination of the most price-effective recycling partner	This feature provides functions to analyze the data material (for example, condition and price analyses), which you can use to compare the performance of different recycling partners.
Automatic generation of forms for the selected recycling partner	This feature allows you to issue the data to be declared either electronically in the form of data medium exchange (DME) or on paper as a form. For the declaration, the system first generates a document that is posted in the declaration system. You can then generate the required documents from this document in accordance with the requirements of the recycling partners.
Certified verification	This feature fulfills country/region-specific reporting requirements. In your periodical declaration, you state the information and totals for all declared articles as a quantity flow in the period under consideration. This feature enables a certified verification at the level of individual documents and items.
Use of existing material information	This feature allows you to access existing material master data and to enhance it. This allows for optimal integration with other features. Using individually configurable interfaces, you can import data from third-party systems and process it further with declaration and analysis functions.
Automatic determination of quantity flow	For generating declarations, recycling administration features automatically obtain important information from the sales and materials management areas.
Cost control and controlling with sales, finance, and controlling features	Recycling administration features are fully integrated with the following features: In the finance area, you enter a recycling partner as a supplier. In the controlling area, a budget is generated for settlement with recycling partners on the basis of the data processed with recycling administration features. Using sales features, you can evaluate the corresponding billing documents.

2.12.1.5 Empties Management

Business Background

Empties Management covers the business processes for procurement of returnable packaging, whose administration and deposit requirements you want to map. You can also manage transport equipment using this component.

You can use Empties Management to handle the procurement process for empties (procurement, returns) alongside suppliers and wholesalers. You can monitor and keep track of the movement of the empties between suppliers, companies and customers.

Empties Management covers the following tasks:

- Entering empties data
- Processing empties data
- Evaluating empties accounts and reports
- Outputting empties statistics

Key Features

The following features are available:

Key Feature	Use
Tracking functions for empties	This feature allows you to manage empties in the document items for movements involving full products in the procurement and sales process. This enables constant control of the empties flow outside your company.
Bills of material for empties	This feature allows you to use sales bill of materials (type 5, alternative 1) to automatically assign the appropriate empties (such as bottles, crates) to a full product (such as beer).
Value-based grouping of empties	This feature allows you to group together bottles (plastic, glass, and so on) that are levied with the same deposit value for listings in Sales (SD).
Stock-specific empties management	This feature allows you to manage empties stocks for each customer in Sales (SD) on a value basis or on a quantity basis, and manage deposits on empties.
Management of empties stock accounts	This feature allows you to manage the customer's empties stock accounts. When the full product is delivered to the customer, the system posts the delivered tied empties to the relevant empties account (empties update). To improve the clarity of the workflows, you can manage the empties in circulation as stock on a quantity basis, but non-valuated.
Empties in Production	This feature allows you to manage new or free empties as a part of the production process (for example, the filling process in the beverage industry). At the end of this process, the empties are part of the finished product. They are then referred to as tied empties.
Warehouse Management for Empties	This feature allows you to manage bought and free empties and empties from your own production on a quantity basis and on a value basis.

2.12.2 Delivery and Transportation

2.12.2.1 Delivery Management

Business Background

Inbound Deliveries

The goods receipt step for inbound deliveries is the final activity you complete before you receive goods into your company. The significant advantage of depicting the goods receipt process through the inbound delivery function is that you can execute many processes in advance, even before the actual goods receipt posting takes place. You have all the necessary information beforehand because the supplier notifies you of the inbound delivery ahead of time. An effective and efficient inbound delivery process enables you to plan for the putaway, packing, and storing of goods that arrive into your company. Inbound deliveries can be derived from a purchase order document or they can be part of a two-step stock transfer process.

Outbound Deliveries

The goods issue step for outbound deliveries is the final activity you complete before you send goods to a customer. An effective and efficient outbound delivery process enables you to plan accordingly for the picking, packing, and shipping of your outbound deliveries. Outbound deliveries are created when the following processes occur:

- Sell from stock: a customer orders goods from your company
- Returns: you return goods to your supplier
- Stock transfer: you transfer goods from one plant to another plant

Key Features

The following table explains the key features available for **inbound deliveries**:

Key Feature	Use
Inbound delivery processing	You use this feature to record planning information, monitor the status of different activities, and document data gathered during the inbound delivery process. When you create an inbound delivery, activities such as putaway commence. Data that is generated during the inbound delivery process is included in the delivery. The inbound delivery supports all goods receipt activities. An inbound delivery can be created as follows: • With reference to a purchase order • With reference to a stock transport order, as the second step for the receiving plant
Packing	With this feature, you can select inbound goods for packing and assign them to handling units (HUs).

Key Feature	Use
Putaway	You can use this feature to put goods away in storage bins in your warehouse.
Goods receipt	This feature enables you to acknowledge that you have received the goods from your supplier. Your stock is updated to reflect this increase in goods.

The following table explains the key features available for **outbound deliveries**:

Key Feature	Use
Outbound delivery processing	You use this feature to record shipping-planning information, monitor the status of shipping activities, and document data gathered during the outbound delivery process. When you create an outbound delivery, shipping activities such as picking or delivery scheduling commence. Data that is generated during the outbound shipping process is included in the delivery. The outbound delivery supports all shipping activities. An outbound delivery can be created as follows: • With reference to a sales order • With reference to a stock transport order • Without any reference
Picking	This feature enables you to move outbound goods from their storage location to a staging area. Once the goods are in the staging area you can prepare them for shipping.
Packing	With this feature, you can select outbound goods for packing and assign them to handling units (HUs).
Goods issue	This feature enables you to post a goods issue. Once you post a goods issue, you initiate the movement of goods from your company to your customer. Your stock is updated to reflect this reduction in goods.

2.12.2.2 Transportation Management

Business Background

Transportation Management in SAP S/4HANA supports the entire transportation chain. You can manage the transportation demands by planning, tendering, and settlement of freight processes. Also, you can book carriers in accordance with the requirements of hazardous goods.

Transportation Management supports the following end-to-end processes:

- Domestic and international transportation for the shipper industry
- Inbound and outbound freight management

Key Features

The following table explains the key features available:

Key Feature	Use
Master data and transportation network	You can create and use central master data such as business partners and products for transportation-related processes. In addition, you can use transportation-specific data to set up your transportation network, for example, locations, transportation lanes, and default routes.
Agreement management	You can use freight agreements in Transportation Management. An agreement is a contract between business partners that details their commitment to conduct business with each other in an agreed manner. It includes contractual data, such as the following: • Organizational unit, for example, the purchasing organization • Involved parties, for example, the ordering party or carrier • Terms of payment • Validity dates Agreement management is integrated with charge management in Transportation Management. Transportation Management calculates transportation charges based on the master data stored in calculation sheets, rate tables, and scales that are created locally or that are created independently of the agreement
Charge management	You can use charge management to set up the master data that the system uses to calculate transportation charges. You can calculate the charges for transporting goods between locations based on the rates you maintain in a rate table or local rate table. The system uses master data, such as agreements, calculation sheets, local calculation sheets, rate tables, and local rate tables, when calculating transportation charges.
Logistics integration	In the integrated logistics process, Transportation Management uses inbound or outbound deliveries to create freight units. In addition, the logistics integration allows you to continuously react to changes of original documents that occur in the system.
Freight order management	In freight order management, you can create and edit freight orders and freight bookings. These documents contain information required for transportation planning and execution, such as source and destination locations, dates or times, and product information, and resources used. You can create freight orders directly or in transportation planning. For example, you can assign freight units to the freight orders, perform manual carrier selection, assign the freight orders directly to a carrier as a suborder, or perform tendering. Further, you can have the system calculate the transportation charges.

Key Feature	Use
Basic tendering	You can use this process to send out freight requests for quotation (freight RFQs) to one or more carriers. You can send the freight RFQs manually. You can also use a direct tendering process to send a road freight order (road FO) directly to a specified carrier without creating a freight RFQ. The carrier can confirm or reject the road FOs. Direct tendering can be created and started manually by the user.
Basic planning	In basic planning, freight units are created on the basis of inbound or outbound deliveries. You can manually assign freight units that are based either on inbound or outbound deliveries to capacities such as freight orders. The system automatically creates freight documents (that is, freight orders or freight bookings) depending on the settings that you have configured in Customizing.
Freight settlement	In freight settlement, a freight order or freight booking provides the basis for the freight settlement document or a credit memo for a freight order. You use this function to trigger the verification of an invoice, which has been received from a supplier or carrier, against a freight settlement document.
Integration	EWM, MM-IM, and LE in SAP S/4HANA (Advanced Shipping and Receiving) The Advanced Shipping and Receiving process simplifies communication between the TM, Extended Warehouse Management (EWM), Stock Room Management (STRM), Inventory Management and Physical Inventory (MM-IM), and Logistics Execution (LE) application components embedded in SAP S/4HANA. It is an integrated, end-to-end process that allows users to send, receive, and transport products. It supports scenarios for one shipping or receiving point with one warehouse serving multiple business partners (customers or vendors) or multiple warehouses serving one business partner (customer or vendor). It helps you to coordinate the inbound process steps from arrival of trucks at the gate to the final goods receipt in the warehouse as well as the outbound process steps from arrival of trucks at the gate to the final goods issue in the warehouse. Communication is simplified by using a harmonized data model, by applying the EDIFACT standard to EDI messages, and by providing dedicated apps and expanding existing apps and RF transactions for shipping and receiving processes.

2.12.3 Warehousing

2.12.3.1 Warehouse Management

2.12.3.1.1 Basic Warehouse Management

Business Background

Basic warehouse management provides support with and real-time transparency into managing and processing material movements flexibly for optimized warehouse operations.

Key Features

The following table explains the key features available:

Key Feature	Use
Warehouse Structure	Basic warehouse management supports you from the very beginning, starting with structuring your warehouse, as follows: • You define the physical structure of your warehouse or warehouse complex and map this in the system. • You define the individual storage types, such as high-rack storage area, bulk storage area, or picking storage area, and join them together under one warehouse number. • You create storage bins for each storage type. Basic warehouse management uses these to manage stock information about all products in the warehouse, at storage bin level.

Key Feature	Use
Inventory Management	You can map your entire warehouse complex in detail in the system, down to storage bin level. This gives you an overview of the total quantity of each product in the warehouse. You can also always see exactly where a specific product is, at any time, in your warehouse complex. You can manage the product quantities in different stock categories on the following levels: • At storage bin level • In intermediate locations • On resources • In handling units • In nested handling units You can also store and manage the following kinds of product in your warehouse: • Batch-managed products • Products with serial numbers • Catch weight products You can also manage the following special stock in your warehouse: • Vendor consignment stock • Project stock • Customer order stock You can make posting changes between different stock types.
Handling Units	A handling unit is a physical unit consisting of packaging materials (load carriers or packing material) and the goods contained in it. A handling unit is always a combination of products and packaging materials. All the information contained in the product items, for example, about batches, is retained in the handling units and is always available. Handling units can be nested, and you can put several handing units into an existing handling unit and manage multi-level nested handling unit structures. A handling unit has a unique, scannable identification number that you can construct according to industry standards such as GS1-128, GTL, or SSCC. You can upload, read, update, or delete attachments to EWM handling units in basic warehouse management

Key Feature	Use
Inbound Processing	You can receive products from the following sources: • Vendors • Production • Other parts of your company • Customer returns, including unplanned returns You can create and confirm multi-step putaway tasks for the putaway of the products, including the following steps: • Unloading • Quality inspection • Deconsolidation • Final putaway You can schedule putaway activities in one of the following ways: • Automatically during inbound deliveries • Regularly at specific times • Manually, using overviews of the daily loads You can optimize your warehouse capacity and material flow by using putaway strategies. These simplify the search for appropriate storage bins for your incoming products by automatically determining suitable storage bins for the incoming products. Note that many of these strategies are based on the use of handling units. You can upload, read, update, or delete attachments to inbound deliveries in basic warehouse management You can process inbound deliveries that are planned by Transportation Management embedded in SAP S/4HANA.

Key Feature	Use
Outbound Processing	You can pick products and send them out of your warehouse for the following scenarios: • Send ordered product to external customers, or internal customers, such as other plants • Supply products to production • Return products to vendors • Supply products to internal consumers, for example, a cost center • Supply products to fill KANBAN containers • Supply products for maintenance orders You can create and confirm goods issue documents for the delivered products. You can optimize your warehouse capacity and material flow by using stock removal strategies. These simplify the physical process of picking by determining the optimal picking bin for the product. You can gather warehouse tasks and enable mobile execution and confirmation using radio frequency (RF) transactions. This allows warehouse workers to perform their tasks with greater efficiency and communicate statuses faster, using mobile RF devices. You can upload, read, update, or delete attachments to outbound delivery orders in basic warehouse management You can process outbound deliveries that are planned by Transportation Management embedded in SAP S/4HANA.
Internal Warehouse Movements	You can plan, create and confirm tasks for moving products to different areas inside the warehouse, for example, replenishment of products in picking bins. You can also perform ad-hoc internal warehouse movements, using RF transactions or from the warehouse management monitor. You can use stock consolidation to free up storage bins or to consolidate partial quantities of products into full units.

Key Feature	Use
Connecting to External Warehouse Control Systems	You can transmit the following from basic warehouse management to a non-SAP system: • Warehouse tasks • Warehouse task cancellation • Pick-handling-units You can specify the circumstances in which a warehouse task is relevant for transmission. You can receive the following from a non-SAP system into basic warehouse management: • Warehouse tasks • Warehouse task confirmation • Stock movements with handing unit • Blocking of storage bins

Key Feature	Use
Physical Inventory	You can plan, conduct and confirm regular counts of actual product quantities in the warehouse and compare the physical stock to the data in the system. Following the count, you can update the accounting data for the stock in the case of differences between the quantity of physical stock and the quantity in the system. This counting can be performed in the following ways: • Annual inventory You record all stocks on a certain day or within a fairly short period (in most cases at the end of the fiscal year). During this time, you can prohibit stock movements. • Ad-hoc physical inventory You carry out inventory-taking for certain storage bins or products. You can do this at any time during the fiscal year. For example, an ad hoc physical inventory may become necessary because a product has been damaged or because you have received complaints from a customer about a product. You can link your counting to a reference document to influence the system quantity as compared with your counted quantity. • Cycle counting You use cycle counting to carry out a physical inventory of your stocks at regular intervals during a fiscal year. You can specify the intervals or cycles at which you are going to carry out the physical inventory for specific products by allocating these products to different classes. For example, this allows you to inventory fast-moving products in your warehouse more frequently than slow-moving ones. • Low-stock or zero-stock checks You can perform low-stock checks when working with product tasks during the picking process, based on a limit value for the storage bin and product (usually a number that is easy to check at a glance). During the physical removal of stock from storage, you check whether the storage bin data reflects the actual stock situation. If the limit is set to zero, it is a zero-stock check. You can trigger a low-stock check manually or the system can trigger it automatically when the stock in the bin falls below the limit. • Putaway physical inventory You can carry out physical inventory for a storage bin at the time of the first putaway in this bin in the fiscal year. During the current fiscal year, no further physical inventory is performed for this storage bin, even if a completely different quant is stored there at the end of the year, or if the bin is empty. • Recounting If you have doubts about a count result, you can trigger a recount.

Key Feature	Use
	i Note Basic warehouse management does not support sample-based physical inventory. An interface for integration to a partner solution is available.
Warehouse Management Monitor	You can use the warehouse management monitor to keep constantly up-to-date as to the current situation in the warehouse, and to initiate appropriate responses to situations that arise. The warehouse management monitor gives you full transparency about the following attributes of your warehouse: • Warehouse activities • Stock and bins • Resources • Planned movements • Executed movements • Inbound deliveries • Outbound deliveries The warehouse management monitor also contains alert monitoring capabilities, which highlight actual and potential problematic situations in the warehouse, and provides exception handling tools.
Analytics	You can use outbound delivery order CDS views to perform outbound workload analysis and progress monitoring and to perform outbound execution quality analysis. You can use storage bin CDS views to get insights into the utilization of storage bins in your warehouse. You can use warehouse task CDS views to perform workload analysis and progress monitoring for putaway, picking, and internal warehouse movements. You can use the overview page to get insight into KPIs relating to outbound delivery orders, warehouse orders, and warehouse tasks.
Resource Management	A resource is an entity representing a user or equipment that can perform work in the warehouse. You can use resource management to maximize the efficiency of your warehouse processes in the following ways: • Facilitate the management and distribution of work • Optimize the selection of warehouse orders for resources requesting work This enables effective monitoring and controlling of resources.

Key Feature	Use
Quality Management	You can check whether delivered products satisfy your quality criteria as part of the inbound process. Basic warehouse management is integrated into Quality Management (QM) using inspection lots of origin 17. You can use inspection rules or the QM master data to determine whether an inbound delivery item is inspection-relevant and to specify the details of the inspection, for example, inspection type, location-independent stock type, or process step performed in the warehouse. QM supports the following scenarios: • Receiving from external sources like vendor or other plants • Receiving from production using warehouse request documents • Partial usage decision • Inspection lot summary to bundle multiple goods receipts • Inspection of stock inside the warehouse • Recurring inspections • Customer returns inspection with integration into Advanced Returns Management • Presampling in production • Acceptance sampling • Goods receipt control by quality information record • First article inspection as part of the production part approval process • Integration to defect processing and quality notifications in the QM component for EWM stock • Split a QM-calculated sample quantity from your inbound stock into a sample quantity and a putaway quantity

Key Feature	Use
Production Integration	You can integrate the supply of products to production and the receipt of products from production into your warehouse. You can also return unused and unneeded parts back into stock in your warehouse. **Delivery-Based Production Supply** With delivery-based production supply, you can supply products to production based on the following order strategies: • Production Orders • Process Orders • Kanban using the strategy *Delivery from an EWM-Controlled Storage Location* You can stage the products required for a production or process order in the following ways: • The required products are pick parts in the case of individual orders, or release order parts in the case of multiple orders, which you stage in time and in the required quantity based on a production or process order. • The required products are products that you use continually, which you stage independently of existing orders. • The required products are materials stored in a crate or container, which you stage independently of manufacturing orders using the special method Kanban. **Advanced Production Integration** Advanced production integration optimizes the supply and receipt of products in the following ways: • You can plan the staging of products for production over a period of time, allowing you to use the space on your production supply area more flexibly. • You can receive packed products as soon as they arrive from the production line using radio frequency. This allows you to synchronize the material flows between the warehouse and production promptly, and improves inventory visibility. Advanced production integration allows you to stage and consume the materials and receive the semi-finished products or finished products in basic warehouse management. You can use advanced production integration for production orders in discrete manufacturing or for process orders in process manufacturing. There is an integration between SAP Manufacturing Execution and advanced production integration. This means that SAP Manufacturing Execution can trigger the creation of staging warehouse tasks for the components, the consumption of components, and the receiving of finished goods in basic warehouse management. Basic warehouse management can also inform SAP Manufacturing Execution when staging is completed.

Key Feature	Use
	Direct Production Integration With direct production integration, you can work seamlessly without delivery documents and warehouse request documents with production in the following ways: • Kanban based on the strategy *Stock Transfer with EWM Warehouse Task* • Receipt from repetitive, discrete, and process manufacturing • Backflush from repetitive, discrete, and process manufacturing **i Note** Direct production integration is available in EWM embedded in SAP S/4HANA only **MES-Driven Staging** You can flag items as relevant for MES-driven staging. You can notify a manufacturing execution system (MES) about the components of a production order. You can receive staging request messages from the MES, including the requested products and product quantities. You can notify the MES when the products are staged and the quantity that been staged.
Integration with Transportation Management	**Advanced Shipping and Receiving** You can integrate shipping and receiving processes with Transportation Management by using information from freight orders in Transportation Management in the shipping and receiving activities in the warehouse.

2.12.3.1.2 Stock Room Management

Business Background

Stock Room Management provides capabilities for small warehouse operations and warehouse operations with low complexity. You can use Stock Room Management as a part of a flexible transition to SAP S/4HANA.

Key Features

The following table explains the key features available:

Key Feature	Use
Inventory Management	You can manage material quantities in different stock categories on the following levels: • Storage bin • Storage unit • Batch • Stock status • Stock attributes You can also manage material quantities without stock on bin level using transfer orders to confirm your picking or putaway activities.
Inbound Processing	You can receive products from the following sources: • Vendors • Production • Other parts of your company • Customer returns You can create and confirm putaway transfer orders for the putaway of delivered or received materials You can use putaway strategies to determine an appropriate storage bin.
Outbound Processing	You can pick products and send them out of your warehouse for the following scenarios: • Send ordered product to external customers, or internal customers, such as other plants • Supply products to production • Return products to vendors • Supply products to internal consumers, for example, a cost center You can create and confirm transfer orders for picking quantities of material for deliveries or production supply. You can use removal strategies to determine an appropriate storage bin to pick from.
Mobile Execution	You can execute warehouse activities on mobile devices using radio frequency (RF) transactions.
Internal Warehouse Movements	You can create and confirm transfer orders for moving products to different areas inside the warehouse, for example, replenishment of products to picking bins. You can also execute ad-hoc internal transfer orders.

Key Feature	Use
Physical Inventory	You can plan, conduct, and confirm regular counts of actual product quantities in the warehouse and compare the physical stock to the data in the system. This counting can be performed in the following ways: • Annual • Continuous • Cycle counting
Reporting	Reporting gives you information about the following attributes of your warehouse: • Open and confirmed transfer orders • Stock information • Bin information • Transfer requirements

2.12.4 Order Promising

2.12.4.1 Available to Promise

Business Background

Internal sales representatives and order fulfillment managers require mechanisms to configure, execute and monitor availability checks and optimize the distribution of supply. This is particularly important when the availability of materials needed to confirm requirements is limited. You can use the basic available-to-promise (ATP) capabilities to confirm on which date and in which quantity a sales order requirement can be fulfilled.

Key Features

The following features are available:

Key Feature	Use
Availability Check	You can use this feature to determine on which date and in which quantity a sales order requirement can be confirmed, based on a specified checking rule and the current supply situation for the specified material. The availability check takes concurrent requirements of differing types and their respective confirmation situation into consideration. The availability check can be executed during order creation and change and during re-scheduling.

2.13 Analytics Technology

2.13.1 Process Performance Monitoring

Process Performance Monitoring allows you to monitor and analyze the performance of business processes. This can be used to identify bottlenecks in process execution and to send notifications about issues in currently running processes. A precondition for the usage of Process Performance monitoring is the configuration of S/4HANA component Process Observer for creating process-specific logs.

2.13.1.1 Process Observer

Process Observer allows you to map business processes executed in the S/4HANA system to an observation process model. The execution of the business processes along with their activities to be monitored is done during process execution. Process performance KPIs such as totals, lead times, and classifications to be evaluated in process performance monitoring are calculated at the same time.

Key Features

- Define end-to-end process definitions as business process observation models
- Maintain a repository of application events and map application events to process steps
- Define process performance KPIs (totals, lead times, and classifications)
- Define thresholds for performance KPIs
- Create instances of running business processes and log process execution information (incl. information about the user and transaction) at runtime
- Calculate process performance KPIs for single process instances at runtime
- Review running process instances that are logged with their KPIs in the process monitor

- Extract data for monitoring and analytics with BI tools

2.13.1.2 Order-to-Cash Performance Monitoring

You can check key figures to get an overview of the order-to-cash performance in your company. For example, you can track delivery blocks or billing blocks, detect changes made to critical fields of sales orders, and monitor lead times like order to delivery or goods issue to billing.

2.13.2 Query Designer

Business Background

Query Design enables you to manage the creation of analytical queries and date functions.

Key Features

The following table explains the key features available:

Key Feature	Use
Date Function	This feature enables you to create date functions that can be used by other apps to calculate single dates and date ranges.
View Browser	With this feature, you can search, browse, and tag analytical and non-analytical queries.
Custom Analytical Queries	This feature enables you to analyze the queries and prepares a report based on the analyzed data.

2.13.3 Analysis Path Framework

Business Background

Analysis Path Framework provides business users and managers an intuitive, easy to use analytical tool to perform interactive data explorations and drill-down analyses for root cause investigations.

Key Features

The following table explains the key features available:

Key Feature	Description
Configure APF-based apps	You can use this feature to build and enhance interactive analytical web applications.
Execute APF-based apps	APF-based apps enable the user to view and analyze the data of several Key Performance Indicators (KPIs) from different data sources. You can flexibly explore KPIs and their influencing factors step-by-step by drilling down into multidimensional visualizations of data, such as charts or tables.

2.13.4 Predictive Analytics integrator (PAi)

Business Background

Predictive Analytics integrator (PAi) integrates predictive capabilities into business processes. PAi uses algorithms to predict an unknown outcome, for example, using a predictive model you can forecast when a buyer is likely to negotiate a new procurement contract.

Business cases requiring a predictive measure are described as predictive scenarios which manage the lifecycle of the predictive models included within them. You can create your own predictive use cases and scenarios as needed.

> **i** Note
>
> Predictive models can only provide good predictions when trained properly. The models need to be trained with data where the outcome is known, for example, with historic data. You must retrain your model regularly to ensure predictions created are based on the most recent data.

Key Features

The following table explains the key features available:

Key Feature	Use
Predictive models	• You can train the predictive models with data relevant for your enterprise. • You can review training status and quality. • You can activate or deactivate model versions. The active model version is the one used to create predictions for consumption in relevant apps. • You can delete any inactive model versions that have never been set active.
Predictive scenarios	Predictive scenarios describe a predictive use case by defining a business goal, the type of prediction to make, for example, regression or classification, and the data to use for the prediction. Predictive Scenarios are preconfigured by SAP S/4HANA. SAP S/4HANA provides an interface through which you can also integrate predictive use cases from another system, currently Predictive Factory, or SAP Analytics Cloud Smart Predict.

2.13.5 Analytics

Business Background

The Analytics framework allows the customers to consolidate business data from different virtual data models, work with real-time data, and build reports. With these reports, customers can easily visualize and interpret the data which in turn will help the decision-makers for better analysis. Analytics framework is enhanced with embedded stories which allows you to analyze data that help in accurate decision making wherein Customers can also view and analyze stories that are embedded within analytics framework

Key Features

The following table explains the key features available:

Key Feature	Use
Query Viewer	You can view and choose a virtual data model or browse only authorized analytical queries. Using these queries, you can configure and visualize data.

Key Feature	Use
KPI, Report, and Stories Visualization	With this, you can: • Visualize and comprehend data from different virtual data models that represent different business areas. • Configure business metrics, interpret and interact with your data in real-time; visualize, and analyze the data. • Create reports for the same KPIs. • Integrate and visualize embedded stories for data analysis

2.14 Enterprise Technology

When SAP S/4HANA applications are deployed on an SAP HANA runtime database, all Enterprise Technology solutions made available to you under your SAP S/4HANA application license/subscription are "Runtime Software" (i.e. as defined in the applicable SAP Software Use Rights document), and thus may only be used to enable performance of the licensed/subscribed to SAP S/4HANA applications. As such, and for the avoidance of doubt, application(s) and/or technology(ies) that are not licensed/subscribed to from SAP may NOT access the SAP HANA runtime database via any Enterprise Technology solution(s); rather, such access is only permissible via the SAP S/4HANA application layer.

2.14.1 ABAP Platform

ABAP platform is the foundation for ABAP-based SAP solutions that build on top of the database and data management platform of SAP HANA.

2.14.1.1 Operating the Application Server for ABAP

Administrators can use the concepts and functions of the SAP Application Server for ABAP (AS ABAP) as a basis for the monitoring and administration of AS ABAP.

Key Features

The following features are available:

General Administration Tasks

Key Feature	Use
Managing SAP licenses	Assign license keys for SAP systems, determine the number of users and used engines of the SAP software for each system, and consolidate measurement results of one or more systems.
Configuring AS ABAP	Configure AS ABAP using profile parameters. For central scenarios you do not need to explicitly set parameter values, since defaults are set and values adapt automatically to physical conditions. Manual configuration of additional scenarios is possible.
Starting and stopping AS ABAP	Start and stop individual instances of your AS ABAP system or the complete system.
Managing and monitoring your AS ABAP within your system landscape	Use SAP Solution Manager to manage and monitor several AS ABAP systems centrally within your system landscape. The functional scope of SAP Solution Manager that is supported for SAP S/4HANA depends on your SAP maintenance contract: See also [https://support.sap.com/solution-manager/usage-rights.html].
Providing and managing hosts, instances, databases, or systems	Provide, monitor, and control any host, instance, database, or SAP system centrally.
Managing network access to your SAP systems and configuring load balancing	Configure the access you want to allow to your SAP network and define access points for Web requests to your network. Such requests can be distributed (using load balancing) between individual Application Servers of your SAP system.
Printing	SAP provides its own spool service and a spool database for printing.
E-mailing	Send e-mails from and receive e-mails within the AS ABAP. Streamline your e-mail correspondence by creating custom templates based on predelivered templates.
Scheduling batch jobs	Schedule local batch jobs in your AS ABAP system.
Backing up and restoring your SAP system	Back up and restore your SAP system on operating system level and database level, if required.

Key Feature	Use
Archiving your data	Use the data archiving functions to archive any completed business transactions that are no longer relevant for your daily operations, and so significantly reduce the load on the database. SAP S/4HANA uses the functions for archiving provided by the ABAP platform.
Managing the lifecycle of current and historical data	Move large amounts of data within a database to gain more working memory. You can manage the current and historical data using the data aging framework.
Managing the lifecycle of live data and archived data based on rules	Use SAP Information Lifecycle Management (SAP ILM) to manage the lifecycle of live and archived data based on rules. • Optimize the data of an application system by moving data that is no longer required for operations into a storage system. The live data and stored data can be destroyed according to legal requirements. SAP ILM requires an additional license.
Enabling your system for SAP remote support	Set up a remote service connection for each ABAP system to use SAP remote services (for example, SAP EarlyWatch or Remote Consulting), or if you would like to permit an SAP support consultant to work directly in your system to make a more precise problem diagnosis.

Local Administration Tasks for AS ABAP

Key Feature	Use
Exchanging the kernel without system downtime	Use an automated procedure to automatically exchange the kernel in an ABAP system, or to make parameter changes while the system is running.
Monitoring components of AS ABAP	Check the consistency of an installation, get an overview of all application server instances and their states, monitor processes, users, lock entries, Internet requests, RFC connections, and RFC calls, and cross-component processes.

Key Feature	Use
Configuring and administering special AS ABAP components	Configure asynchronous RFCs, logon load balancing, operation modes, area menus, and the number range buffer. You can also send important notifications to all users that are logged on to the ABAP system in the form of short messages.
Troubleshooting	Use the trace function, the ABAP dump analysis, and the system log to identify and solve issues.
Managing concurrent database access	The SAP system is equipped with a special lock mechanism that synchronizes database access. The purpose of the lock mechanism is to prevent two transactions from changing the same data in the database simultaneously. You can configure, administer, and monitor database updates related to ABAP transactions.
Managing the available memory of your ABAP system	Use profile parameters to configure SAP Memory Management in order to adjust the ABAP Server to hardware and software requirements.
Managing background processing	Configure and monitor background processing of the AS ABAP, and schedule and manage local background jobs.

Other Administration-Related Services for AS ABAP

Key Feature	Use
Managing alerts	Inform responsible or interested parties immediately via a predefined alert if the application detects a critical situation and triggers the alert management to create the alert.

Database Administration for SAP HANA

Key Feature	Use
Starting and stopping the SAP HANA database	Start and stop the SAP HANA database.
Monitoring and administering the SAP HANA database	Monitor and administer local or remote SAP HANA databases in SAP systems in an ABAP environment.

Software Logistics

Key Feature	Use
Managing and transporting development objects	Organize ABAP development projects and transport changes between SAP systems in your system landscape. In addition to the classic Change and Transport System (CTS), you can leverage git repositories to store ABAP content and to provide it to ABAP systems. You can also copy ABAP clients and transport languages. Similar to ABAP objects, you can also transport Java objects and SAP-specific non-ABAP applications in your system landscape. A close integration for transporting development objects of ABAP and SAP HANA is provided.

Other Tasks

Key Feature	Use
Maintaining Employees	Maintain business users with business role "Employee", with a workplace address, and a user assignment.

2.14.1.2 Custom Application Development for ABAP

Business Background

A key ingredient for business applications is custom development. The ABAP development environment offers a wide range of options for custom application development from extensions and modification of SAP standard applications by customers up to the development of completely new applications.

Key Features

The following key features are available:

ABAP Language

ABAP is a fourth-generation (4GL) as well as an object-oriented programming language developed and constantly improved/enhanced by SAP for programming business applications in the SAP environment.

Key Feature	Use
Internal tables	Store and process mass table data dynamically in the working memory.
Managing updates of data in the database	Use the concept of the SAP Logical Unit of Work (LUW) integrated into the ABAP runtime environment which enables multiple users to access the central database at the same time.
Using external interfaces	Use Remote Function Call as an interface to other programming environments. Use the Internet Communication Framework (ICF) as an interface to the Internet. Use the built-in transformation capabilities to support XML and JSON.
Supporting UIs in multiple languages	Extract language-specific program components from the source code, which are reloaded when the program executes in accordance with the environment.

Data Modeling

Data modeling provides capabilities for defining data models in the database that can be used for business applications.

Key Feature	Use
ABAP Dictionary	Maintain data types in a persistent repository that are visible in all repository objects. The database tables of the central database, views, and lock objects are managed in ABAP Dictionary.
ABAP Core Data Services (CDS)	Implement SAP's CDS concept for AS ABAP. The concept provides a platform-independent Data Definition Language (DDL) to define CDS views and CDS table functions that implement a semantically rich data model.

Database Access

Database access provides capabilities for accessing database entities.

Key Feature	Use
ABAP SQL	Access data through ABAP SQL statements integrated into the ABAP programming language. The ABAP statements allow access to ABAP-managed database objects in SAP HANA defined in the ABAP Dictionary or by ABAP CDS.

Key Feature	Use
Native SQL	Platform-dependent access to a database. Native SQL includes an embedded static access (`EXEC SQL` ABAP statement), a class-based, general purpose access in SAP HANA using ABAP Database Connectivity, and ABAP-managed database procedures.

ABAP RESTful Application Programming Model (RAP)

The ABAP RESTful Application Programming Model supports the model-based development of browser-based applications, Web APIs and analytical scenarios that are intrinsically optimized for SAP HANA. It is based on technologies and frameworks such as Core Data Services (CDS) for defining semantically rich data models, ABAP-based application services for custom logic and a business service model infrastructure for creating business services

Key Feature	Use
Developing brownfield applications	Develop OData services (V2 or V4) using existing code with the unmanaged implementation type, which supports initial draft handling.
Developing greenfield applications	Develop OData services (V2 or V4) from scratch with the managed implementation type. This includes draft handling, determinations and validations, optimistic (ETag) and exclusive locking, for managed early numbering based on UUIDs.
Developing analytical scenarios	Develop analytical services that are based on analytical data models and exposed with the SAP Information Access (InA) protocol for live data access.
Creating data models for entities (read-only access), business objects (transactional access), and analytical models (analytical access) using CDS views	A data model that defines the data structure explicitly, such as relations between datasets, data semantics, and their restrictions.
Defining the behavior of business objects	Define the lifecycle operations on the data, such as create, update and delete, further operations such as actions and transactional properties of the data model.
Implementing business objects	Supply the business logic for the behavior definition in ABAP.
Defining service definitions	Define the scope of a business service by exposing the relevant CDS entities.
Creating service binding	Expose a business service by binding its service definition to a protocol and a scenario. Consume a business service via OData (V2 or V4) or InA protocol.

ABAP Programming Model for SAP Fiori

The ABAP Programming Model for SAP Fiori (Application Infrastructure) adopts technical details from the application development and improves the overall development process.

New applications shall be implemented using the ABAP RESTful Application Programming Model (RAP).

Key Feature	Use
Exposing CDS views through OData	Generate OData services based on CDS views without any additional implementation.
Supporting transactional applications on a stateless protocol via draft	Expose CDS-based BOPF business objects through stateless OData services.

Business Object Processing Framework (BOPF)

The Business Object Processing Framework is an ABAP object-oriented framework that provides a set of generic services and functionalities to speed up, standardize, and modularize your development. BOPF manages the entire life cycle of your business objects and covers all aspects of your business application development.

New applications shall be implemented using the ABAP RESTful Application Programming Model (RAP).

Key Feature	Use
Creating and defining business objects	Create new business objects in order to encapsulate business logic and data to be exposed through common interface. Use BOPF tools for developing and testing business objects.
Enhancing business objects	Enhance existing business objects through custom business logic and data.
Integrating as well as combing business objects and non-BOPF applications	Invoke application logic that is not built on BOPF through BOPF objects and vice versa.
Reusing application infrastructure	Reduce development and maintenance effort through reuse of existing BOPF services.

Server Technology

The components of the infrastructure server technology provide a reusable runtime environment for other components that also uses client server technology to process requests.

Key Feature	Use
Application Server ABAP	Use the ABAP runtime environment as a virtual machine for ABAP programs.
Building globalized custom applications	Build globalized custom applications using internationalization technologies and data encodings.
Internationalization	Provides technologies and data encodings for building globalized custom applications.

ABAP Development Tools

The ABAP development tools enable ABAP developers to build their own applications and features using the ABAP programming language and the ABAP Application Server capabilities in an Eclipse-based IDE or on the classic SAP GUI-based ABAP Workbench.

Key Feature	Use
Creating and managing data definitions	Specify ABAP coding such as reports and includes, function modules, classes, and interfaces. Use ABAP Dictionary artifacts such as structures and data elements to create and manage data definitions (metadata).
Rearranging table columns to application-specific needs	Build CDS views on existing database tables using Core Data Services.
Converting between ABAP data and XML formats	Describe transformations between ABAP data and XML formats using transformations (XSLT and ST).
Error handling	Use options such as message classes to inform the user about an error or a status, or to issue a warning
Developing SAP standard UI technology	Use the supported UI Technologies [page 207] to develop SAP solutions
Modularizing and encapsulating development objects	Modularize SAP systems and encapsulate development objects using packages and package interfaces.
Managing the lifecycle of development activities	Modularize, encapsulate, and decouple units in the SAP System using a Package Builder. Transport objects to other SAP systems.
Creating and managing workflow scenarios	Build scenarios to enable flexible workflow creation, and prepare an environment for modeling workflows

ABAP Testing and Quality Tools

The AS ABAP offers a set of specialized test and analysis tools that are useful at different phases of the software lifecycle (development, testing, and production).

Key Feature	Use
Checking code quality	Use static checks of the ABAP Test Cockpit (ATC) and the Code Inspector to analyze customer code for functional, usability, or performance issues. Use the remote ATC checks to verify code quality on older SAP NetWeaver releases with the latest check version. Use static checks of the Code Vulnerability Analyzer (extra license required) to analyze customer code for possible security vulnerabilities.
Unit testing ABAP programs	Use ABAP Unit test classes to develop and execute test classes that ensure the correct behavior of program logic.

ABAP Troubleshooting Tools

The ABAP Troubleshooting Tools enable you to detect functional and performance issues through debugging, tracing, monitoring, and logging applications.

Key Feature	Use
Debugging	Set breakpoints and step through a running ABAP application, analyze and change variable values, and examine the call stack to understand the program integration in the general application context. Debug ABAP-managed database procedures (AMDP) and simple transformations.
Profiling ABAP source code	Create ABAP trace files to analyze the distribution of an application's time consumption with respect to database and ABAP runtime. Also, to significantly improve the overall performance and detect hotspots such as: • SQL accesses • ABAP procedures or statements with poor performance • redundant executions of same program parts
Monitoring SQL performance of an ABAP system	Collect essential SQL performance data along with the ABAP contexts of all SQL statements performed in an ABAP system. Analyze the collected data for time intervals of your choice.
Dynamic logging	Create dynamic logpoints for specific code positions to gain runtime information like the number of executions, variable values, call stack information, or to use them for triggering system functions like the SQL trace. It is not necessary to change source code in order to use dynamic logpoints.

Extensibility

The extensibility configuration framework allows different interface implementations of the application parts to be exchanged during the runtime of an application.

Key Feature	Use
Create custom fields, data source extensions, and custom logic	Create your own fields and enhancement implementations for specific business contexts of extensible applications. Enable the usage of existing fields in predelivered data sources using data source extensions. **Custom Fields** • You can translate the fields that you created into different languages and enable field usage for UIs, reports, email templates, form templates, business scenarios, and APIs. • You can make field content relevant for free-text search. • You can choose the aggregation behavior of fields. • You can delete already transported fields. When you delete an already transported field, the contained data is saved for 18 months. **Data Source Extensions** • You can create, edit, and delete data source extensions in order to enable the usage of existing fields in predelivered data sources. **Custom Logic** • You can implement custom logic with ABAP for key users in your enhancement implementation. • You can create and save variants for testing custom logic with predefined parameters. • You can create and save filters to define under which conditions the logic of an enhancement implementation is used. You can publish fields and enhancement implementations and thus generate them in the extensible applications in your test system. You can edit fields and enhancement implementations even after they have already been published. You can delete fields and enhancement implementations.
Manage custom logic after upgrades	Adapt enhancements and modifications after an upgrade or support package implementation due to changes in SAP applications.
Create enhancement options	Create, edit, and delete enhancement options for Business Add-ins (BAdI) or source code plug-ins to make custom applications for ABAP extensible.

Key Feature	Use
Customizing analytical queries	Design a meaningful query for analyzing and reporting purposes without knowing query language and other technical details. Perform various operations such as create a new query, copy from the existing query, modify the query, add/remove custom fields, adding dimensions and measures from the data view, defining filters, and preview result set.
Create custom reusable elements	You can create reusable custom libraries for consumption in custom logic extensions or custom objects. You can create translatable custom code lists for reuse across custom business objects.
Create custom CDS views	You can create and maintain custom CDS views based on the virtual data model delivered by SAP. You can define projections and add associations to your custom CDS views. You can maintain parameters, filters and calculated fields. You can define custom CDS views without a scenario or as cubes, dimensions or for usage as external API.
Create traces	You can create traces to track the processing of custom logic in custom objects, custom reusable elements and enhancement implementations.
Create custom business objects	Create new custom business objects, and generate OData services based on custom business objects.You can enable associations between your custom business objects. You can add fields to and delete fields from custom business objects. You can add multiple subnodes to a custom business object, and implement custom logic with ABAP for key users. You can edit and publish a custom business object, and delete the draft of a custom business object. You can delete custom business objects.
Display list of extension items	You can view a list of your extensibility items, and the dependencies between them.
View namespaces	You can view namespaces which were used for extension item development.
Configure software packages	You can configure software packages to be used for extension item development.
Register extension items for transport	You can assign extension items to a transport.

2.14.1.3 Security for ABAP

Business Background

In today's world of collaborative business processes and open system environments, security no longer means just adding a firewall and using passwords to log on. It requires a complete approach that not only applies to your own IT landscape, but also to issues that arise beyond your own borders, in which even simple organizational measures can have a significant impact. The infrastructure of the ABAP platform supports you by delivering comprehensive security features for heterogeneous environments.

Key Features

The following features are available:

Key Feature	Use
Authorization management	Assign authorizations to users with roles. Create roles. Mass maintenance enables authorization management for many users. User information system allows for reporting of roles and their authorizations.
Identity management	Define user validity. Maintain user master data. Set user types. Support for mass maintenance of user data. Delegated user administration. User information system allows for reporting of users. Synchronize users data with other systems.
Central user administration	Push users and authorizations from a central system in a system landscape.
Security policy	Define security policies to control password policies, logon policies, and policies for logon IDs.

Key Feature	Use

User authentication and single sign-on	Configure the authentication methods and policies supported by the system. For the following scenarios, SAP NetWeaver Application Server supports the following authentication and single sign-on (SSO) methods:
	• SAP GUI logon
	  ○ Password-based authentication
	  ○ SSO for SAP Shortcuts
	  ○ SSO with an external SNC product
	• Web-based logon
	  ○ Password-based authentication
	  ○ SSO with logon tickets
	  ○ SSO with X.509 client certificates
	  ○ Kerberos with SPNego
	  Requires a license with SAP Single Sign-On to support
	  ○ SSO with external SAML 2.0 identity provider
	• SOAP Web Services
	  ○ Transport level authentication and SSO with user ID and password, X.509 certificates, and authentication assertion tickets.
	  ○ Message level authentication using user name token, X.509 certificate token, and SAML token. You can also use WS-specific security and authentication mechanisms, such as XML encryption, XML signatures, Message Aging, and WS SecureConversation
	• OAuth 2.0 authorization framework
	  ○ Acts as both resource server and authorization server in the same system for OData requests
	  Can act as client
	• Log off methods where possible

Digital signatures and encryption	Encrypt data during transport: Support of transport layer security (TLS), secure network communication (SNC), and web service security. Digitally sign and verify signed documents. Manage digital keys.

Key Feature	Use
System security functions	A virus scan interface enables you to connect third-party virus scan software to detect malware during uploads or stored in your system. Logging functions record security-related events. The audit information system provides an infrastructure for conducting audits in SAP NetWeaver Application Server. Store connection information for RFC and HTTP destinations.

2.14.1.4 UI Technologies

Business Background

SAP provides a wide set of user interface (UI) technologies for different purposes. The UI frameworks provide capabilities for developing applications tightly integrated into the respective landscapes.

The frameworks and tools available include several that are focused on developing transactional applications, as well as others that help business experts create appealing, state-of-the-art user interfaces without the need for development skills. In the ABAP environment in particular, there are many options available for extending or adapting existing applications. The user interface clients provide a consolidated access to all of these different applications. They provide structured access through role-based navigation, and a harmonized look and feel across the various underlying UI technologies.

Key Features

The following features are available:

Key Feature	Use
Developing and adapting applications	UI frameworks can be used to develop user interfaces by coding or based on a composition and orchestration environment that builds screens with specific UI elements. Use one of the following UI frameworks to develop applications tightly integrated into the corresponding landscapes: • SAPUI5 (UI development toolkit for HTML5): Create apps with rich user interfaces for modern Web business applications, responsive across browsers and devices, based on HTML5. • Web Dynpro ABAP: Develop Web applications based on ABAP from scratch or use the templates/patterns provided by Floorplan Manager (FPM) for easy and efficient development. Adapt your WDA applications without touching the code, and define the range in which users can personalize these applications further. • Dynpro ABAP/ SAP GUI for HTML Create classical SAP GUI transactions. • SAP Visual Business: Visualize and combine enterprise data with geographical or 3D real-world scenes
Creating your own themes	With the UI theme designer you can create your own themes to adapt the visual appearance of applications based on different UI technologies (including SAPUI5 and Web Dynpro ABAP).
Providing consolidated access to your applications	Use one of the following UI clients to provide structured access through role-based navigation, and a harmonized look and feel across the various underlying UI technologies: • SAP Fiori launchpad • SAP Business Client • SAP GUI

2.14.1.5 Integration and Connectivity

Business Background

Core communication technologies provided by the ABAP platform.

Key Features

The following features are available:

Key Feature	Use
Remote Function Call (RFC)	Communication via RFC/bgRFC. Communication between applications of different systems in the SAP environment includes connections between SAP systems as well as between SAP systems and non-SAP systems. Remote Function Call (RFC) is the standard SAP interface for communication between SAP systems. RFC calls a function to be executed in a remote system. bgRFC provides additional services, such as queues, and qualities, such as exactly-once-in-order execution of RFC function modules.
UCON RFC Security	Restricted external RFC access and simplified RFC administration. UCON RFC security allows the administrator to restrict external access to RFC function modules. In addition, it provides simplified administration, for example, by analyzing the required RFC authorizations and creating different RFC user roles.
UCON HTTP Allow List	Administration of HTTP trust relationships. The UCON HTTP allow list allows the administrator of an AS ABAP to specify trusted Web sites with respect to different HTTP functionalities, like embedding of UIs, redirects, or Cross-Origin Resource Sharing (CORS). It provides a learning mode to support the administrator with this task.
Internet Communication Framework (ICF)	Communication via HTTP. Internet Communication Framework (ICF) enables communication with the SAP system using Internet standard protocols (HTTP, HTTPS, and SMTP). ICF is an integrated component of AS ABAP.

Key Feature	Use
ABAP Channels (AC)	ABAP Push Channels (APC) provide "push" messages between the ABAP Application Server and Web browsers. ABAP Message Channels (AMC) provide a publish/subscribe messaging inside the ABAP Application Server. TCP sockets enable the ABAP Application Server to communicate directly via simple TCP protocols with programmable logic controllers (PLCs) and other devices. The MQTT protocol enables the ABAP Application Server to communicate directly with MQTT message brokers in the client role. Both plain MQTT and MQTT over WebSocket are supported.
ABAP Daemons	Framework providing sessions with unlimited lifetime. ABAP Daemons provide a concept similar to Linux cron jobs or Windows Services. Once started, there is no limit for the lifetime of such sessions. Applications can use daemons to handle events in a reliable way as stateful sessions.
Web Services ABAP	ABAP Web service provisioning. A Web service is an independent, modular, self-describing application function or service. Based on XML and other standards, this application function can be described, made available, located, or called using Internet protocols. The Web service infrastructure in the ABAP Application Server provides functionality to develop, configure, execute, and monitor both inbound and outbound Web services.
SAP Web Dispatcher	HTTP(S) load balancing and request routing. SAP Web Dispatcher is a software load balancer and reverse proxy for the HTTP(S) protocol. It supports SAP systems and their load balancing and request routing requirements.
SAP Gateway Foundation	SAP Gateway Foundation offers development and generation tools to create OData services to a variety of client development tools. It establishes a connection between application or SAP Business Suite data and target clients, platforms, and programming framework.
SAP Application Interface Framework	Interfaces often transfer important business data between systems. SAP Application Interface Framework provides monitoring and error handling tools that enable business users to easily handle interface-related errors (for example, material 4711 does not exist, or cost center 1234 is locked). In addition, SAP Application Interface Framework provides tools to develop custom interfaces and reusable interface components for various communication technologies. **i Note** For the interface development feature, you need a separate license. For further information, please contact your SAP Account Executive.
Business Network Integration	Business Network Integration is a collection of tools and services that enables SAP applications like Business Suite, SAP S/4 HANA and others, to communicate and exchange business documents in cross application processes with other business networks such as Ariba Business Network, and Fieldglass, using the HTTP/Web services.

2.14.1.6 Services for Business Users on the Application Server for ABAP

Key Features

The following key features are available:

SAP HANA enterprise search

SAP HANA enterprise search is a powerful universal search solution across multiple business entities that provides full-text search, navigation, and access to business entities. It is deeply embedded in SAP S/4HANA.

Key Feature	Use
Defining search models	You can define search models to optimize your search. Search models can consume the following features: • Fuzzy search algorithms optimized for special semantics and use cases • Synonyms • Ranking dimensions according to business criteria • Navigation into applications connected with business entities of the search models • Integrated support for SAP authorization concepts
Administrating enterprise search	You can administrate SAP HANA enterprise search. The following options are available: • Tune and simulate the scoring of search result list items according to application- or customer-specific criteria • Define synonyms • Evaluate search logs

General Services

Key Feature	Use
Building structured record and case views of diverse application data and electronic documents to boost business user productivity	Make interacting with complex application data easier and more intuitive for your business users. You can orchestrate data from SAP software in cases and records, search and retrieve data, manage cases, and define ad hoc workflows.
Creating and managing workflows	Define approval workflows for a line of business or an organization.

2.14.1.7 Embedded Business Warehouse

Business Background

Embedded Business Warehouse (Embedded BW) is used to support certain business processes in SAP S/4HANA, such as integrated financial planning, using SAP Business Planning and Consolidation for SAP S/4HANA (SAP BPC for SAP S/4HANA). Embedded BW is not intended to be used for data warehousing (EDW) use cases.

As a guideline, the amount of data persisted in the Embedded BW should not exceed 20% of the overall data volume of the system. This applies to:

- Extraction from your own SAP S/4HANA system
- Integration of data from external applications
- Data from planning applications

Key Features

The following key features are available:

Meta Data Management

Key Feature	Use
Creating models	• Create meta data entities (characteristics and key figures) • Model master data and its attributes and hierarchies • Model persistence objects for transactional data and master data • Create virtual objects to combine objects • Organize meta data objects in data flows to build logical modeling units
Creating queries	• Create queries by selecting and combining characteristics and key figures or reusable query elements on top of the model as a basis for multi-dimensional data analysis
Deploying models	• Organize objects using packages to transport from development to production • Record and deploy changes of objects

Data Warehouse Management

Key Feature	Use
Data acquisition	• Load data from various sources (such as a file, DB table, SAP ERP, SAP S/4HANA)
Data propagation	• Load data between BW persistence objects and transform data • Support propagation of changed data • Track change history of persistence objects • Filter out erroneous data
Scheduling	• Define the sequence of data processing tasks • Scheduling and execution (serial or in parallel) • Process management to track the status of each task and support a load status for each persistence object
Monitoring & troubleshooting	• Monitor the different processes based on persistence objects and modeled process sequences • Rollback data loads • Restart data loads
Exposing data	• Generate database views for SAP HANA to enable SQL access • Define export format as files, DB tables or other SAP BW-Systems • Schedule export of data considering changed data

Analytic Manager

Key Feature	Use
Analyzing data	• Interpret the query definition and the current navigation state • Multi-dimensional analysis of data • Read data from BW providers, SAP S/4HANA virtual data models (Core Data Services) and SAP HANA DB views using filters • Apply aggregation, calculations and conversions • Apply sorting and ranking • Use master data and hierarchies • User-specific access management Embedded BW relies on a separate authorization concept. Authorizations from SAP S/4HANA do not apply but need to be mapped if required. For SAP S/4HANA virtual data models only, authorizations from SAP S/4HANA apply. • For BW providers only: Support of standardized external interfaces (including certification)

Key Feature	Use
Supporting enhanced business semantics (for BW providers only)	• Inventory key figures and stock cover reports • Elimination of internal business volume • Special time semantics (e.g. fiscal times) • Currency translation and unit calculations
Planning engine	• Enabling integrated financial planning, using SAP Business Planning and Consolidation for SAP S/4HANA (SAP BPC for SAP S/4HANA) SAP BPC for SAP S/4HANA requires an additional license.

2.14.1.8 Software Logistics

Business Background

Procedures such as installing SAP S/4HANA, keeping the system up-to-date, and other system- and database-related procedures require the use of a separate toolset, which is available for customers of SAP S/4HANA.

Key Features

Software Maintenance

Key Feature	Use
Installing systems	Plan new SAP systems and reliably install and initially configure them in your landscape according to your requirements (for example, the distribution of instances to single hosts).
Upgrading to SAP S/4HANA	Upgrade to SAP S/4HANA from specific source releases (see current documentation for details).
Converting SAP ERP systems to SAP S/4HANA	Conduct a technical conversion of an SAP ERP system to SAP S/4HANA (see current documentation for details).
Copying systems and refreshing systems	Create consistent copies of your SAP ABAP system, for example, to create a test system as a copy from production or refresh an SAP ABAP system.
Installing and distributing front-end software	Install/update front-end software (such as SAP GUI) and distribute it to your client computers.

Key Feature	Use
Renaming existing SAP systems	Change technical characteristics of an existing SAP ABAP system, for example, change the SAP system ID, instance number, or host name.
Updating and patching	Import support packages and deploy patches and SAP Notes to keep your system up to date.
Handling of Add-ons	Install, update, and delete add-on software delivered by SAP and partners.

2.14.2 SAP S/4HANA Java

SAP S/4HANA Java is used as the runtime platform to support the execution of selected Java components for SAP S/4HANA.

2.14.2.1 Operating the Application Server for Java

Business Background

Application Server for Java (AS Java) is used as a runtime platform to support form-based processing of business data triggered by both ABAP- and Java-based applications.

Key Features

The following features are available:

Printing Forms

Key Feature	Use
Form processing and form printing	Adobe Document Services (ADS) enable form-based processing of business data triggered by both ABAP- and Java-based applications.

Configuring Application Server for Java

Key Feature	Use
Configuring AS Java automatically	Automatically configure your system directly after installation by using the functional unit configuration tool, which makes the technical settings for Java functional units.
Configuring AS Java manually	Configure AS Java for scenarios that go beyond the automatic configuration.

Administering Application Server for Java

Key Feature	Use
Modifying service, manager, or application properties	View the current system configuration and edit the service, manager, and application properties.
Managing applications	Manage applications with their modules (Web, Enterprise Java Beans, and so on) and resources (JDBC, JMS, JCA).
Managing ICM	Administer the Internet Communication Manager (ICM), which is responsible for accepting and forwarding requests in an AS Java instance.
Managing locks	Administer and monitor SAP locks (held in the lock table by the enqueue server) with different tools.

Key Feature	Use
Managing the SAP Message Server	Monitor and administer the SAP Message Server.
Using the Startup Framework of AS Java	Start, stop, and monitor the AS Java using the Startup Framework
Backing up and restoring	Back up AS Java and the relevant database to prevent data loss. This is essential for the recovery of the server after the system breaks down.
Managing the gateway	Administer and monitor the gateway that enables SAP systems and external programs to communicate with one another.
Manage your system landscape information	Store information about technical systems, landscapes, business systems, products, and software components in a central repository.

Monitoring of Application Server for Java Using SAP NetWeaver Administrator

Key Feature	Use
Using history reports to monitor AS Java	To monitor your local system, you use the SAP NetWeaver Administrator tool History Reports.
Monitoring and displaying log files	Check the logs regularly for error messages to ensure the stable and error-free operation of the system.
Using open SQL monitors	Monitor the execution of SQL statements, the status of the table and catalog buffers, as well as the availability and the use of Open SQL database connections.
Using JPA monitors	Monitor information about all JPA applications that are running on a given cluster.
Monitoring JCo connections	Analyze JCo connections, organize the metadata cache, and change the settings for JCo traces.

Central Monitoring of Application Server for Java Using CCMS

Key Feature	Use
Monitoring using the CCMS	Monitor the status data of AS Java from a central SAP monitoring system using the CCMS.

2.14.2.2 Security for Java

Business Background

In today's world of collaborative business processes and open system environments, security no longer means just adding a firewall and using passwords to log on. It requires a complete approach that not only applies to your own IT landscape, but also to issues that arise beyond your own borders, in which even simple organizational measures can have a significant impact. The infrastructure of the SAP NetWeaver technology platform supports you by delivering comprehensive security features for heterogeneous environments.

Key Features

The following features are available:

Key Feature	Use
Authorization management	Assign authorizations to users with roles. Create roles. Mass maintenance enables authorization management for many users.
Identity management	Define user validity. Maintain user master data. Set user types. Support for mass maintenance of user data. Delegated user administration. Source user data from LDAP or ABAP system. Export and import principal data. Provision and manage principals with an SPML interface. Enable support for self-registration and logon help, such as forgotten passwords. Configure virtual groups based on user attributes. User mapping for principals for single sign-on to back-end systems. Configure e-mail notification for user management events.

Key Feature	Use
Security policy	Define security policies to control password policies, logon policies, and policies for logon IDs.

User authentication and single sign-on	Configure the authentication methods and policies supported by the system. For the following scenarios, SAP NetWeaver Application Server supports the following authentication and single sign-on (SSO) methods:
	• Web-based logon
	  ○ Password-based authentication
	  ○ SSO with logon tickets
	  ○ SSO with X.509 client certificates
	  ○ Kerberos with SPNego
	  ○ SSO with external SAML 2.0 identity provider
	  ○ Header variables
	• Web Services
	  ○ Transport level authentication and SSO with user ID and password, X.509 certificates, and authentication assertion tickets.
	  ○ Message level authentication using user name token, X.509 certificate token, and SAML token. You can also use WS-specific security and authentication mechanisms, such as XML encryption, XML signatures, Message Aging, and WS SecureConversation
	• OAuth 2.0 authorization framework
	Acts as both resource server and authorization server in the same system
	A client application can be either one that is deployed on the AS Java or one that is not
	• Log off methods where possible

Digital signatures and encryption	Encrypt data during transport: Support of transport layer security (TLS), secure network communication (SNC), and web service security. Offer functions for the encryption of data at rest, whether it is passwords, credit card data, in the database, or in the file system. Digitally sign and verify signed documents. Manage digital keys.

Key Feature	Use
System security functions	A virus scan interface enables you to connect third-party virus scan software to detect malware during uploads or stored in your system. Logging functions record security-related events. The audit information system provides an infrastructure for conducting audits in SAP NetWeaver Application Server. Store connection information for RFC and HTTP destinations.

2.14.3 Enterprise Information Management

2.14.3.1 Master Data Maintenance

Business Background

Master data represents the business data your company requires about individuals, organizations, or products. It remains unchanged over a long period of time and supports transactional processes. You can use Master Data Maintenance to maintain master data like products or business partners.

Example: Example

You can define business partners, for example employees, contingent workers, customers and suppliers, and you can define materials or services. Additionally, you can define relationships between the business partners and the materials or services. For example, information about a specific material and the supplier of this material is stored in a purchasing info record.

The mass maintenance feature enables you to update multiple business partner and product master data records simultaneously.

2.14.4 Process Management and Integration

2.14.4.1 Responsibility Management

Business Background

This feature enables you to group responsible members, who perform specific functions in a business process, as a team. You can use teams, members, and functions in frameworks, such as workflows or situation handling to determine responsible members which receive focus about specific circumstances or business situations. For example, end users receive a notice about upcoming deadlines, warnings about delays, or are informed about tasks that need to be completed as soon as possible.

Key Features

This table explains the available key features:

Key Feature	Use
Maintain teams	Create, edit, delete, and copy team information.
Maintain team global ID	Create a team global ID to reference a team across multiple systems.
Maintain team owners	Be responsible for the overall team definition. Team owners can create, edit, delete, and copy team information. Additionally, they are notified when their team members are unavailable as agents.
Manage team members	Add members to, or remove them from, a team.
Validate team member functions (if configured)	See if team members are authorized for the functions assigned to them.
Assign functions to team members	Add or remove functions that a team member can use.
Replace team members	Find and replace a member and associated functions with another member across teams.
Create custom responsibility definitions	Enter values for responsibility definitions created for teams and edit inherited responsibility definition values.
Create custom responsibility rules	Create or copy a responsibility rule and customize it to suit your business process requirements.
Extend responsibility contexts	Extend a standard responsibility context by creating a custom agent rule to which a custom responsibility rule is assigned.

Key Feature	Use
Create custom responsibility contexts	Create your own custom responsibility contexts as per your business requirements.
Manage team categories	View standard team categories provided by SAP or create and edit your own custom team categories.
Maintain team hierarchy	Create subteams with specific responsibility definition values and assign new members based on their responsibilities to the subteams. Choose from a list of potential subteams with responsibility definition values that match the parent team.
Change log	See changes (old and new values) made to a team definition.

2.14.4.2 Machine Learning Scenario Management

Business Background

Intelligent Scenario Lifecycle Management (ISLM) integrates machine learning capabilities into business processes to provide forecasts and predictions for your use cases (for example, forecast when a buyer is likely to negotiate a new procurement contract or predict the cost of a project based on the historic data analysis).

Key Features

The following table explains the key features available:

Key Feature	Use
Develop Intelligent Scenarios	Intelligent scenarios describe a predictive use case by defining a business goal, the integration type (embedded and side-by-side), the type of prediction to make, and the data to use for the prediction. Intelligent scenarios are preconfigured by SAP S/4HANA or you can create custom-developed intelligent scenarios. The custom-developed intelligent scenarios are created in a draft mode, which can be reviewed, updated, and published.

Key Feature	Use
Manage Intelligent Scenarios	You manage the published intelligent scenario activities, such as the following: • You can train with data relevant to your enterprise. • You can review the training status and quality. • You can activate or deactivate the machine learning model. Once activated, the model is used to provide results to the business application. **i Note** A machine learning model can only provide good predictions when trained properly. A model needs to be trained with data where the outcome is known, for example, with historic data. You must retrain your model regularly to ensure predictions created are based on the most recent data.

2.14.5 Business Event Handling

Business event handling enables applications, partners, and customers to consume events related to all S/4HANA business objects.

Business Background

Business event handling enables applications, partners, and customers to consume events related to all S/4HANA business objects.

In addition, you can view and manage subscriptions, read outbound queues, and view business events.

Key Features

The following table explains the key features that are available:

Key Feature	Use
View Subscription	You use this feature to view the existing subscriptions. A subscription is an entry that enables you to be notified about the changes that are made to the business objects.
Manage Subscription	You use this feature to create, update, and delete already subscriptions.
Read Outbound Queue	You use this feature to view the entries present in the outbound queue. New entries are created in the outbound queue when the business objects are either created or changed.

Key Feature	Use
View Business Events	You use this feature to view the number of events that are raised for a particular business object.

2.14.6 Business Event Logging

Business Event Logging enables you to capture and log business events that are raised by S/4HANA applications when business processes are executed in the local system.

Business Background

You can use business event logs to get insights on process execution in the local system. You get an overview of all the logged business events, the number of events triggered, and the types of events triggered.

Key Features

The following table explains the key features available:

Key Feature	Use
Activate Business Event Logging	You use this feature to enable the collection of business event logs raised for a particular business object.
View Business Event Logs	You use this feature to view business event logs for business objects.
Extract Business Event Logs	You use this feature to extract business event logs for external consumption.

2.14.7 Enterprise Event Enablement

The Enterprise Event Enablement framework enables the exchange of events across different platform for seamless event-driven communication.

Business Background

You can publish events triggered from SAP S/4HANA applications and consume these events in the apps built on SAP Cloud Platform Enterprise Messaging, Cloud Foundry Environment.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage Connection	You use this feature to establish a connection between SAP S/4HANA system and a service instance of SAP Cloud Platform Enterprise Messaging to publish events.
Maintain Event Topics	You use this feature to maintain topics to which events can be raised from business applications.

2.14.8 Situation Handling

Business Background

With Situation Handling, you can increase the quality and the efficiency of your business processes by signaling exceptional circumstances and providing heads-up information. Situation Handling informs end users proactively about business situations requiring their attention. Key users get insight into the life cycle and handling of situations, which helps them to optimize business processes.

Situation Handling supports two kinds of situations:

- **Object-based situations** that indicate situations for specific business objects, such as a contract, a service order, an invoice, or a material.
- **Message-based situations** that refer to warning and error messages in system runs.

Key Features for Object-Based Situations

This table explains the key features available for object-based situations:

Key Feature	Use
Copy and adapt situation types	Create situation types that can be adapted to your requirements.
Adapt conditions	Adapt conditions based on which situations occur.
Edit texts	Edit the situation texts that are displayed to the end user.
Define recipients	Select teams, functions, and other attributes by using integrated Responsibility Management to define who is informed about situations.

Key Feature	Use
Monitor status of situation instances	Monitor the handling of situation instances that occur in your company (only available for the standard framework).
Create custom situations	Define your own business scenarios, based on which you can create your own custom situations (not available for the standard framework).

Use Case Examples for Object-Based Situations

Users get a heads-up about upcoming deadlines, receive warnings about delays or exceeded thresholds, deviations, missing approvals, and so on. This enables users to quickly follow up on tasks.

Key Features for Message-Based Situations

This table explains the key features available for message-based situations:

Key Feature	Use
Create situation templates	Create use case templates from a situation scenario that is specific to a business area.
Create situation types	Create a situation type based on a situation template that can be adapted to your specific business requirements.
Manage run types and messages	Manage system messages of run types that are turned into situations.
Edit texts	Edit the situation texts that are displayed to the end user.
Define recipients	Select teams, functions, and other attributes by using integrated Responsibility Management to define who is informed about situations.

Use Case Examples for Message-Based Situations

End users can be informed about locks, deviations, or incorrectly maintained master data resulting in error messages during application runs. This enables users to quickly follow up on tasks

2.14.9 Document Builder

The SAP Document Builder component lets you author simple to complex documents quickly and easily, using customer defined formats, templates, and clause content.

SAP Document Builder adds value to any business scenario that has a need to generate documentation. The content of the document may be simply formatted correspondence with fill-in values, such as recipient name, or it may be a very rigidly formatted contract with hundreds of clauses selected by rule-based logic (for example, include clause A if procurement value > $100,000).

Business Background

Key Features

The following table explains the key features available:

Key Feature	Use
Dialog	Provides a collection of decision and fill-in type questions (variables) that are linked to logic statements are presented to the user within a structured process. Follow-on questions are filtered based on logic and the answers to previous questions.
Element Library	Provides a collection of clauses and forms used to create an output document.
Rules Logic	You use this for creating logic to present the appropriate questions within the dialog and include or exclude elements within the output document.
Element Versioning	Provides the ability to store multiple element versions, based on the version date or number, within the element library. Element versioning ensures that the appropriate element is included in the output document.
Output Document	You use this to generate docx output documents. The output documents include library elements that were chosen based on Dialog and Rule selections or manual user input. Documents can also be assembled in PDF with the use of Adobe Lifecycle.

2.14.10 SAP S/4HANA Output Control

Business Background

SAP S/4HANA output control enables business applications to define and trigger outgoing communication with business partners.

Key Features

The following table explains the key features available:

Key Feature	Use
Output Channels	• Printer • Email - allows flexible configuration of senders and recipients • XML - integration with the Ariba Network • IDoc - electronic data exchange with business partners
Form Technologies	• PDF-based print forms with fragments (default) • PDF-based print forms • Smart Forms • SAPscript
Master Form Templates	Allow flexible branding of print forms by separating static layout parts such as header, footer, or logos from the application content.
Email Templates	Allow predefining email subject and email body, including variables for dynamic content.
Output Parameter Determination	Allows sending multiple messages to multiple recipients using multiple channels at the same time. Flexible definition of business rules without the need for implementation. Easily extensible with SAP standard fileds and customer fields.
Manage Output Items	Central overview of outputs sent via various channels and their status. View and process multiple outputs at the same time.

2.14.11 APIs

Business Background

SAP S/4HANA provides application program interfaces (API) to further extend or integrate your system, and also allow you to implement your own applications. SAP offers a publicly available catalog where customers obtain information on the provided technical interfaces.

Key Features

The following table explains the key features available:

Key Feature	Use
Connect	Connect business processes across your system landscape
Integrate	Integrate with external systems
Develop	Develop your own dependent extensions or custom applications

2.14.12 Behavioral Insights

Business Background

Behavioral Insights allows organizations, such as government agencies and companies, to analyze the behavior of customers and to generate risk scores and insights . It provides an expanded overview of events. This enables the organization to perform an efficient and reliable analysis of the customer, so that they can make decisions and take the necessary manual actions

Key Features

This table explains the available key features:

Key Feature	Use
Customer Analysis	• You can use the machine learning baseline scenarios **Receivership**, **Late Payment**, and **Late Filing** to train and predict the scenario that an organization will go into the risk of receivership, late payment or late filing status. These scenarios predict a specific outcome using historical data and a predictive model. • You can use the Receivership scenario to predict the entities that might have a risk of going into receivership. • You can use the Late Payment scenario to predict the entities that might not pay the amount due by the due date. • You can use the Late Filing scenario to predict the entities that might not file a tax return by the due date. • The prediction is done by calculating the probabilities for each of the entities based on different features that each entity has performed. • You can use check the health of readiness for the prediction and training data set and configurations. • You can filter by machine learning-based scenarios. You can also filter customers by parameters, such as the customer type, customer ID, debt range, risk score range, and other attributes. • You can analyze risk scores and trends for each customer according to how the scenario is configured. • You can view the highest influencing factors that determined the scenario risk score for each entity, as well as the actual value and relative influence of each factor. • You can view all details about each customer, their risk scores, as well as their debt and event behavior over multiple time periods. • You can view related risks for each entity. • You can view the missed due dates, outstanding debt plotted over time, and details of each event. • You can use Debtor Analysis scenario to analyze the transactions and debt of the customer across all account types or tax types.
Administration	You can perform the following administration tasks: • Configuration - You can configure customer extraction rules, categories, events, event extraction rules, range, prediction extraction rules, scenarios and a reason text. • Data Protection and Privacy configuration - You can provide access to information retrieval, read access logging, change logs, and data erasure functionalities. • Operational activities - You can perform machine learning training and predictions for the baseline scenarios.

Key Feature	Use
Analysis and	You can perform the following analysis tasks: • You can integrate the data from Behavioral Insights with the SAP Analytics Cloud for analytics. • You can use SAP Analytics Cloud to analyze event data, risk scores and influencing factors. • You can integrate the Machine Learning risk scores from Behavioral Insights with SAP Marketing Cloud for further actions.

2.15 Enterprise Search

Business Background

Enterprise Search is a search solution that provides unified, comprehensive, and secure real-time access to enterprise data which enables users to search for structured data (business objects) and allows direct access to the associated applications and actions.

Key Features

The following table explains the key features available:

Key Feature	Use
Search	This feature enables you to search for different business objects and apps from the Fiori Launchpad and start the apps directly from the search results. The apps are a separate entity which performs tasks that are part of business processes.
Personalized Search	Using this feature, you can enable or disable the tracking of a user's search activities. The search data is retained in the database. This data can be used for user specific ranking of search results in the Enterprise Search.
Browse Search Models	This feature displays all the CDS-based Enterprise search models. You can navigate to each search model and view the artifacts such as CDS views, tables, fields, relationships between views and the source code of the entire search model or particular CDS view.

2.16 Country/Region-Specific Features in SAP S/4HANA Enterprise Management

This section lists and explains the key features for each country/region, covering localized features and the general feature(s) for which localization extension is provided.

2.16.1 Americas

Key Features

The following tables contain the key features for the countries in Americas.

Argentina

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Process document numbering according to legal requirements for outgoing documents. Manage print authorization codes.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Master Data	Update customer and vendor master data according to legal requirements.
	Payables Management	Calculate withholding taxes in payments and generate payment notice.
	Receivables Management	Generate payment notice and post debit/credit memos.
	Withholding Tax	Update vendor master data with withholding tax exemptions and run reports with withholding tax and perceptions. Create withholding tax certificates. Post withholding tax.
Cash	Account Balancing	Manage daily report for bank and cash accounts.
General Ledger	Journal	Run general ledger document journal and credit invoice list.
Tax	VAT Reporting	Process daily value-added tax (VAT) report.

Business Area	Key Feature	Use
	Tax Reporting	Tax reporting (magnetic media): Generate magnetic files: electronic duplication, purchases and sales information regime and perception, and withholding taxes.

Sales

Business Area	Key Feature	Use
Billing and Invoicing	Master Data	Maintain customer master data.

Brazil

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Withholding tax calculation with standard functionality for INSS and IRRF and Condition-Based Tax for PIS, COFINS, and CSLL..
Cash	Banks and House Banks	Process localized bank master data.
	Bank Statement	Process bank files in required formats (Febraban, Itaú, and Bradesco).
	Payment Format	Process payment forms for the processes of payments using Credit on Account, Check, Payment Order, DOC, TED; Payment of boletos, Collection (Boleto) and DDA.
Tax	Tax Calculation	Calculate taxes according to regulations and business practices specific to Brazil.

Sales

Business Area	Key Feature	Use
Billing and Invoicing	Nota Fiscal Electronic Nota Fiscal Electronic Conhecimento de Transporte	Create and process outgoing Notas Fiscais (NF), electronic Notas Fiscas (NF-e) and electronic Conhecimentos de Transporte (CT-e), and electronic Correction Letter.
Sales Master Data Management	Customer Material Info Record	Maintain the record of the material according to the material data provided by your customer.

Business Area	Key Feature	Use
Sales Contract Management	Contract Processing	Process a contract with your customer.
	Customer Scheduling Agreement	Process a scheduling agreement for your customer.
Sales Order Management and Processing	Sales Order Processing	Process sales orders taking into account industrialization, resale, consumption/asset, and services requirements. In addition, the following processes are supported. • Future Delivery • Consignment stock • Third party direct ship, including Triangular Operation with Third Party Sales • Returnable Package • Return • Price and Taxes Complementar • Credit Note
	Inquiry Processing	Create a sales inquiry from your customer, such as quotations or sales information without obligation.
	Query Procesing	Create, change, or display a quotation for your customers.

Source and Procurement

Business Area	Key Feature	Use
Sourcing	Purchase Info Record	Maintain the record about a specific material and its supplier.
	Purchase Requisition Creation and Approval	Create purchase requisitions and manage the approval of purchase requisitions.
	Purchase Order Processing	Enables you to carry out localized processes for Brazil, such as: • Normal Purchasing • Credit Memo (Return) • Subcontracting • Future Delivery • Consignment • Returnable Package • Triangular Operation: Service • Freight
	Contract	Create a purchasing contract with a vendor.

Business Area	Key Feature	Use
	Scheduling Agreement	A scheduling agreement can be created when a material is regularly requested and provided in accordance with a delivery schedule dates.
Invoice Management	Supplier Invoice Verification	Process the verification of the invoice receipt for electronic Notas Fiscais (Nf-e) including NF-e Complementar and Conhecimentos de Transporte eletrônicos (CT-e).

Supply Chain

Business Area	Key Feature	Use
Goods Issue	Outbound Delivery Processing	Enable you to post a goods issue integrated with Nota Fiscal issuing.
Goods Receipt	Posting Goods Receipt	Enable you to post a goods receipt integrated with Nota Fiscal posting.

Chile

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.
	Business Place	Manage the activation of business place.
	Official Document Numbering	Number outgoing documents according to your requirements.
	Pre-Numbered Invoices	Prepare reports on sheets of pre-numbered papers numbered consecutively.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	VAT	Use tax numbers.
	Withholding Tax	Process withholding tax report in accounts payable.
	Inflation Management	Inflation adjustment of open items.
Asset Management	Inflation Management	Revaluate assets.
Cash	Cash Desk	Prepare cash journal with data.
	Inflation Management	Inflation management of G/L accounts.
General Ledger	Financial Statement	File a balance sheet for tax purposes (balance tributario) in the prescribed format at the end of each fiscal year.
	Journal	Process a daily journal for all accounting documents relating to your operating activities in chronological order.
	Master Data	Make settings for localized master data.
	Trial Balance	Prepare trial balance and line items in general ledger.
Inflation Accounting	Inflation Management	Replacement of cost valuation.
Tax	VAT Reporting	Prepare sales and purchases ledger.

Supply Chain

Business Area	Key Feature	Use
Goods Issue	Outbound Delivery Processing	Enable you to post a goods issue integrated with electronic documents.
Goods Receipt	Posting Goods Receipt	Enable you to post a goods receipt integrated with electronic documents.

Colombia

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Process generic withholding tax reporting and monthly freelance data.
General Ledger	Postings and Documents	Manage year-end postings in general ledger account balance.

Mexico

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Number outgoing documents according to your requirements.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Ledger	Prepare a list of your top customers.
	Withholding Tax	Process generic withholding tax reporting.
General Ledger	Audit Files	Generate files for auxiliary and electronic accounting.
	Journal	Manage localized journal entries.
Tax	Deferred Tax	Process deferred tax transfer and certificates.
	VAT	Use tax numbers.
	VAT Reporting	Prepare tax reports for sales and purchases.

Peru

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.
	Official Document Numbering	Number outgoing documents according to your requirements.
	Pre-Numbered Invoices	Prepare reports on sheets of pre-numbered papers numbered consecutively.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	VAT	Use tax numbers.
	Withholding Tax	Process withholding tax report and certificate in accounts payable.

Business Area	Key Feature	Use
Cash	Cash Desk	Process cash journal according to the local standard best practices.
General Ledger	Ledger	Manage general ledger and journal ledger reporting.
Tax	VAT	Use tax numbers.
	VAT Reporting	Process sales and purchases ledger reporting.

United States of America

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Receivables Management	Generation of Print Form 1099-C (Cancellation of Debt – IRS.gov).
	Withholding Tax	Generic Withholding Tax Report is used to generate the relevant print and file output of the following IRS forms: • Form 1099-MISC (Miscellaneous Income – IRS.gov) • Form 1099-G (Certain Government Payments – IRS.gov) • Form 1099-INT (Interest Income – IRS.gov) • Form 1099-K (Payment Card and Third Party Network Transactions – IRS.gov) Form 1042-S (Chapter 3 only – Foreign Person's U.S. Source Income Subject to Withholding – IRS.gov).
Tax	Tax Reporting	Display of tax information for Sales and Use Tax.

Venezuela

Cross Features

Business Area	Key Feature	Use
Cross Feature	Business Place	Manage the activation of business place.
	Official Document Numbering	Number outgoing documents according to your requirements.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Manage generic withholding tax reporting and maintain withholding tax details.
	Inflation Management	Inflation adjustment of open items.
Asset Accounting	Inflation Management	Revaluate assets.
Inventory Accounting	Inflation Management	Replacement of cost valuation.
General Ledger	Inflation Management	Inflation management of G/L accounts.
Tax	VAT	Use tax numbers.
	VAT Reporting	Process sales and purchases ledger reporting.

2.16.2 Europe

Key Features

The following tables contain the key features for the countries in Europe.

Austria

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Asset Accounting	Closing Operations and Reporting	Manage asset history sheet.

Business Area	Key Feature	Use
General Ledger	Closing Operations and Reporting	Collect and prepare data for Balance of Payments.
	Financial Statement	Manage annual financial statement.
Tax	VAT: EC Sales List	Process EC sales list.
	VAT Reporting	Generate XML files for periodic VAT returns.

Belgium

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Report withholding tax.
General Ledger	Closing Operations and Reporting	Collect and prepare data for Balance of Payments
Tax	VAT: EC Sales List	Create an EC sales list in XML format.
	VAT Reporting	Generate XML files for periodic VAT returns and annual sales listings.

Bulgaria

Finance

Business Area	Key Feature	Use
Asset Accounting	Closing Operations and Reporting	Manage fixed assets reporting.
	Depreciation	Influence the line values calculated on the asset level in the various depreciation reports.
General Ledger	Trial Balance	Prepare a material trial balance. Additionally, you can also reconcile G/L account balances on material accounts with total value on material level.
Tax	Closing Operations and Reporting	Process cash flow statement.
	Deferred Tax	Transfer the tax from the deferred tax account to the normal tax account.
	Tax Invoice	Print out VAT protocol in the form as required by the tax authorities.
	VAT Reporting	Prepare tax return in the form as required by the tax authorities. Prepare VIES declaration as part of the monthly VAT submission.

Croatia

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Number outgoing documents according to your requirements.
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Receivable	Overdue Receivables	Generate quarterly statistical report and submit it in the electronic format.
General Ledger	Trial Balance	Prepare a list of G/L account balances and line items in accordance with legal requirements.
Tax	VAT	Generate the report for all domestic deliveries with the tax obligation transfer.
	VAT: EC Sales List	Create the EC Sales List for tax reporting.
	VAT Reporting	Generate XML files for periodic VAT returns.

Sales

Business Area	Key Feature	Use
Billing and Invoicing	Governmental Document Validation	Handle fiscal numbering of invoices and communicate details of all cash transactions to the tax authorities.

Czech Republic

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process

Finance

Business Area	Key Feature	Use
Cash	Cash Desk	Process cash journal by handling cash receipts.

Business Area	Key Feature	Use
General Ledger	Postings and Documents	Enables you to create postings for year-end closing of profit and loss statements as well as the opening and closing balance sheet accounts.
Tax	VAT: EC Sales List	Generates a list that contains information on all tax-free goods deliveries and goods movements to registered companies within the EU.
	VAT Reporting	Prepare and process VAT return, VAT ledger statement and the EC sales list (DMEE).

Denmark

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Cash	Payment Format	Create a payment format for domestic and foreign payments, and direct debit.

Estonia

Finance

Business Area	Key Feature	Use
Cash	Cash Desk	Process localized cash journal functions by entering incoming and outgoing payments. You can post incoming and outgoing cash payments to a customized G/L account, and print the cash vouchers.
General Ledger	Financial Statement	Process financial statement (balance sheet and profit and loss statement).
Tax	Corporate Income Tax	Manage the calculation and display of social tax amounts and income tax amounts.
	VAT Reporting	Prepare and process value-added tax return.

Finland

Finance

Business Area	Key Feature	Use
Cash	Payment Format	Create a payment format for SEPA and cross border payments.
Tax	VAT Reporting	Generate files for periodic VAT returns.

France

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Report withholding tax.
General Ledger	Closing Operations and Reporting	Collect and prepare data for Balance of Payments.
Tax	Calculate Pro Rata VAT	Enables you to generate VAT returns in an electronic format and submit it to the tax authorities on a regular basis.
	VAT: EC Sales List	Generate a list that contains information on all tax-free goods deliveries and goods movements to registered companies within the EU.
	VAT Reporting	Prepare periodic VAT returns.

Germany

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Process withholding tax return.
Tax	EC Sales List	Perform and submit EC Sales List.
	Tax Returns	Perform and submit Electronic Advance Tax Returns.
	VAT Reporting	Prepare periodic VAT returns and review G/L Account information.

Greece

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Number outgoing documents according to your requirements.
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Maintain transaction records involving bills of exchange and postdated checks.
	Check	Create and print G/L account cheques.
	Digital Signature	Provides you the tool to sign and approve digital data.
	Ledger	Displays line items per vendor/customer/business partner.
	Official Documents	Generate a printout of the document (referred to as FISA), that you attach to the original document at the time of filing.
	Payables Management	Display the year-end balance of each vendor along with the valuated total for each vendor.
	Receivables Management	Display line items for all customer account postings as well as special G/L transactions.
	Trial Balance	Display the period balances for all customer and vendor accounts.
Asset Accounting	Closing Operations and Reporting	Manage investment support for assets and fixed asset register.
General Ledger	Clearing	Automatically transfers open items of the 3201 account type to the respective accounts. Additionally, you can also perform automatic clearing of these line items.
	Closing Operations and Reporting	Enables you to customize the company code address data and the way this data appears in the header of the legal books.

Business Area	Key Feature	Use
	Journal	Process all FI postings of a specific posting date range.
	Ledger	Process line items for all posting accounts.
	Official Documents	Generates a printout of the document (referred to as FISA), that you attach to the original document at the time of filing.
	Parallel Ledger	Defines the intermediate account used by A/L for groups of G/L accounts, which is then used for postings.
	Postings and Documents	Enables change validation of the posting date
	Purchasing	Enables activation of the purchasing account by searching for source document types in order to make the necessary postings.
	Trial Balance	Displays the period balances for all G/L accounts.
Tax	Audit Files	Submit customer and vendor information to KEPYO at regular intervals.
	Deferred Tax	Transfer the tax from the deferred tax account to the normal tax account.
	VAT	Generate VAT returns in an electronic format and submit it to the tax authorities on a regular basis.
	VAT Reporting	Prepare tax return in the form as required by the tax authorities.

Hungary

Cross Features

Business Area	Key Feature	Use
Cross Features	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document submission by a custom solution for the transport registration process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Payment Format	Create a payment file for domestic payments in the format defined by the clearing bank.
	Posting Business Transactions	Process entering vendor invoices and payments.
Bank Applications	Loans	Process interest suspension functions, debt transfer functions, itemized commitment and off-balance posting of contract amounts.
Cash	Cash Desk	Process exchange rate calculation for outgoing payments.
General Ledger	Audit Files	Prepare an XML file containing a comprehensive list of issued invoices.
Tax	Deferred Tax	Process deferred tax.
	VAT	Generate VAT returns in the required format and submit it to the tax authorities on a regular basis.
	VAT: EC Sales List	Process EU sales and purchases list in XML file format.
	VAT Reporting	Prepare tax return in the form as required by the tax authorities. Prepare domestic sales and purchases list.

Ireland

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Master Data	Provides information about individuals, organizations, or products that is used regularly and in a consistent manner.

Business Area	Key Feature	Use
	Withholding Tax	Calculate and report withholding tax.
Tax	VAT	Generate VAT returns in an electronic format and submit it to the tax authorities on a regular basis.

Italy

Cross Features

Business Area	Key Feature	Use
Cross Features	Official Document Numbering	Number outgoing documents according to your requirements.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document submission by a custom solution for the B2G outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Post bills of exchange presentation document.
	Closing Operations and Reporting	Reevaluate current assets and liabilities in foreign currency. You then post the reevaluation differences to the relevant accounts.
	Withholding Tax	Report withholding tax.
Asset Accounting	Depreciation	Compare an asset depreciation over two depreciation areas.
Cash	Payment Format	Create an EC sales list in DME format.
General Ledger	Postings and Documents	Generate year-end profit and loss statement postings, and closes the balance sheet accounts and carries forward their balances into the new fiscal year.
Tax	Deferred Tax	Transfer the tax from the deferred tax account to the normal tax account. For sales made to public institutions, the tax authorities grant extension of time to remit the tax payable.
	VAT	Calculate Pro-Rata VAT.

Business Area	Key Feature	Use
	VAT Reporting	Prepare periodic VAT returns, generate files containing transactions with customers and vendors.

Kazakhstan

Cross-Features

Business Area	Key Feature	Use
Cross-Features	Trade Expense Management	Generate Import taxes declaration (form 320.00) in XML file format. Generate Customs Union's Import claim (form 328.00) in both PDF and XML file formats.
	Electronic Documents	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Cash	Cash Desk	Print cash journal, cash book and incoming/outgoing cash vouchers.
General Ledger	Financial Statement	Generate financial statements (balance, profit and loss statement, cash flow reports) in PDF format in accordance with the legal requirements.
Tax	Corporate Income Tax	Subsoil use contracts split accounting functionality for the corporate income tax calculation purposes.
	Tax Invoice	Printing an outgoing invoice and an act of acceptance of works performed. Invoice journal for issued and received invoices. Direct exchange with web services of the Electronic Invoices Information System (EIIS).
	Property Tax	Calculate property tax in accordance with legal requirements.

Business Area	Key Feature	Use
	Transport Tax	Calculate transport tax in accordance with legal requirements.
	VAT Reporting	Generate VAT declaration in XML file format.

Supply Chain

Business Area	Key Feature	Use
Inventory Management	Output processing	Allows the printing of forms required for goods acceptance, internal goods movement and goods issue processes.

Latvia

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Number outgoing documents according to your requirements.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bank Statement	Import an electronic bank statement to clear outstanding accounts receivable and payable.
Cash	Bank Statement	Convert the bank statement file to MT940 with field86 structured format.
	Cash Desk	Generate legal forms of incoming and outgoing payments.
Tax	VAT	Generate VAT returns in an electronic format and submit it to the tax authorities on a regular basis.
	VAT Reporting	Prepare tax return in the form as required by the tax authorities.

Lithuania

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Closing Operations and Reporting	Create a register that contains a list of all customer and vendor invoices.
Tax	VAT: EC Sales List	Generate a list that contains information on all tax-free goods deliveries and goods movements to registered companies within the EU.

Luxembourg

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
General Ledger	Closing Operations and Reporting	Collect and prepare data for Balance of Payments.
	Financial Statement	Generate financial statements.
Tax	Audit Files	Generate a SAF-T file in a format as required by the tax authorities.
	VAT: EC Sales List	Generate a list that contains information on all tax-free goods deliveries and goods movements to registered companies within the EU
	VAT Reporting	Generate XML files for periodic VAT returns.

Netherlands

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Receivable	Periodic Activities and Closing Operations	Determines how the compensation for the collection of overdue payments (dunning charges) is calculated.
Tax	VAT Reporting	Prepare VAT returns and EC sales lists in the form as required by the tax authorities.

Norway

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Trial Balance	List the opening and closing balance of each vendor/customer in accordance with legal requirements.
Cash	Payment Format	Make domestic and foreign payments by bank transfer in Telepay, BBS, and DATADIALOG format.

Business Area	Key Feature	Use
General Ledger	Trial Balance	Display G/L accounts with opening/closing balances and line items.

Poland

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Monitoring of Receivables	Generate a list of all customer invoices and vendor invoices that are not settled within their payment due date.
	Trial Balance	Prepare a statement of your accounts payable and receivable in accordance with legal requirements.
	VAT	Prepare VAT registers in accordance with the legal requirements.
	VAT Date	Indicates the tax reporting date in the document header. The relevant reports collect documents based on this date.
Asset Accounting	Closing Operations and Reporting	Prepare a list of assets in accordance with the legal requirements.
Cash	Payment Format	Use domestic bank transfer file format (Elixir-0).
	Valuation	Manage foreign currency valuation of cash account balances.
General Ledger	Ledger	Prepare a list of G/L account balances and line items in accordance with the legal requirements.
Inventory Accounting	Periodic Valuation of Material Inventories	Prepare turnover of the appropriate material account.

Business Area	Key Feature	Use
Tax	Tax Invoice	Generate and print internal invoices that contain the required VAT data.
	VAT	Process acquisition tax accruals. Manage reverse charge form for normal and correction runs.
	VAT: EC Sales List	Generate a list that contains information on all tax-free goods deliveries and goods movements to registered companies within the EU.

Portugal

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Manage generic withholding tax reporting.
Asset Accounting	Closing Operations and Reporting	Manage asset reporting, revaluation areas/classes/exceptions, and currency revaluation. Use the Mapas Fiscais to retrieve details of assets in your company and print these details on forms specified by the tax authorities in Portugal.
General Ledger	Closing Operations and Reporting	Process balance of payments using central bank reporting, and SCB indicator assignments.
Tax	Audit Files	Prepare and process standard audit file for tax purposes (SAF-T).
	Tax Invoice	Customer master data validations (VAT number cannot be changed after digitally signed documents are posted).

Business Area	Key Feature	Use
	VAT	Apply pro-rata VAT method in order to determine tax deduction.
	VAT Reporting	Prepare and process input tax refund, annual sales return to tax office, advance return for tax on sales/purchases.
Public Sector Funds Management	Payment Authorization Proposal	Create and process Payment Authorization Proposals.
	Credit Release Request	Authorize and release funds.
	Monthly Budget	Carry out Budget Postings, Release Monthly Budget and Advance Monthly Budget.
	Project System Integration	Funds Management / Project System integrations for the processing of contracts.
	Materials Management Integration	Funds Management / Materials Management integrations for the processing of purchase orders and invoice verifications.

Romania

Finance

Business Area	Key Feature	Use
Asset Accounting	Closing Operations and Reporting	Process asset chart and asset history, asset revaluation.
Cash	Cash Desk	Process cash journal. Print petty cash receipt.
	Payment Format	Make bank transfer payments.
General Ledger	Financial Statement	Prepare and process financial statement - for example, balance sheet and profit and loss statement.
	Journal	Process documents journal.
	Ledger	Process general ledger and account card for miscellaneous operations with corresponding accounts.
	Trial Balance	Process general ledger account balance.
Tax	VAT	Manage tax code procedures, process tax code assignments for normal/deferred tax system. Apply pro-rata VAT method in order to determine tax deduction if is the case.

Business Area	Key Feature	Use
	VAT: EC Sales and Purchases List	Process VIES 390, declaration (XML file).
	VAT Reporting	Prepare and process advance return for tax on sales/purchases for normal and deferred tax system. Manage VAT declarations – XML file (VAT 300, VIES 394).

Russia

Cross Features

Business Area	Key Feature	Use
Cross-Features	Trade Expense Management	• Generate import customs declarations, record and track their numbers when the company sells imported goods. Generate export customs declarations. Calculate and post customs fees and duties, if relevant. • Generate goods import declarations for importing goods from the countries of the Eurasian Economic Union.. • Perform currency control during currency transactions with foreign companies: generate deal passports, create supporting document statements and currency transaction statements, keep track of the status of payments and shipments with foreign companies.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Postings and Documents	Manage contract accounting and automatic contract filling, process documents with negative postings.
	Closing Operations and Reporting	Manage automatic clearing.
	Payables Management	Accounting of down payments, payments analysis, process electronic invoices, delivery and acceptance documents.
	Receivables Management	Accounting of down payments, payments analysis, process electronic invoices, delivery and acceptance documents.
	Transfer Pricing	Process transfer pricing to evaluate the transfer of goods or services between dependently operating companies.

Business Area	Key Feature	Use
	Trial Balance	Manage customer and vendor turnover balance and intercompany balance reconciliation.
Asset Accounting	Closing Operations and Reporting	Process inventory reports and asset revaluation.
	Depreciation	Calculate and process depreciation and depreciation bonus.
	Master Data	Make settings for localization data used in property and transport tax calculation.
Cash	Cash Desk	Process cash journal and print cash documents.
General Ledger	Closing Operations and Reporting	Process balance sheet, profit and loss statement, cash flow statement and foreign currency valuation report.
	Offset Accounting	Process offsetting account determination.
Tax	Corporate Income Tax	Process profit tax reports.
	Tax Invoice	Issue paper and electronic invoices, including corrective and revised invoices.
	Property Tax	Calculate the tax amount and prepare tax return for property tax.
	Transport Tax	Calculate the tax amounts and prepare the tax return for transport tax.
	VAT	Separate VAT, deferred tax and VAT for goods in transit.
	VAT Reporting	Process sales and purchases ledger, invoice journal, inquiries from tax authorities and prepare VAT return.

Supply Chain

Business Area	Key Feature	Use
Inventory Management	Physical Inventory	Carry out the physical inventory for material stocks. Offset stock surpluses against stock shortages that have been found during physical inventory. Prepare a list of stock on hand at the beginning and end of each period, showing the value of the stock as well as its quantity. Allows the printing of forms required for physical inventory.
	Output Processing	Allows the printing of forms required for goods acceptance, internal goods movement and goods issue processes.

Sales

Business Area	Key Feature	Use
Billing and Invoicing	Billing	Allows the printing of invoices.

Serbia

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Trade Expense Management	Process customs declaration.
Asset Accounting	Depreciation	Process tax depreciation.
Cash	Bank Statement	Convert Halcom to MultiCash format.
	Payment Format	Create and export predefined TXT file with payment data required for e-banking program.
General Ledger	Financial Statement	Prepare and process financial statement.
	Ledger	Prepare general ledger for postings, as well as calculated and deducted VAT in predefined electronic format.
Tax	VAT Reporting	Prepare tax return in the form as required by the tax authorities.

Slovakia

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Master Data	VAT cash accounting.
Asset Accounting	Depreciation	Accelerated depreciation method.
Cash	Bank Statement	Derivation of external transactions from payment symbols.
General Ledger	Financial Statement	Enables you to create postings for year-end closing of profit and loss statements as well as the opening and closing balance sheet accounts.

Business Area	Key Feature	Use
	Closing Operations and Reporting	Process cash flow statement.
Tax	Deferred tax	Manage deferred tax transfer and the analysis of deferred tax accounts.
	VAT	Create and reverse acquisition tax accruals.
	VAT Reporting	Prepare and process VAT return, VAT ledger statement and the EC sales list (DMEE).

Slovenia

Cross Features

Business Area	Key Feature	Use
Cross Features	Official Document Numbering	Number outgoing documents according to your requirements.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	VAT	Manage accounting document validation.
Cash	Bank Statement	Manage bank statements in various formats.
	Payment Format	Create and adjust payment medium formats.
General Ledger	Closing Operations and Reporting	Mange statistical reporting to create period reports SKV, BST and SFR for The Bank of Slovenia and The Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES).

Business Area	Key Feature	Use
	Ledger	Prepare a list of G/L account balances and line items in accordance with the legal requirements.
Tax	Audit Files	Generate tax books and list of invoices paid in cash or by credit cards in a format as required by the tax authorities.
	VAT	Create and reverse acquisition tax accrual. Tax reporting date in the document header. The relevant reports collect documents based on this date.
	VAT: EC Sales List	Create the EC Sales List for tax reporting.
	VAT Reporting	Prepare form DDV-O for reporting.

Spain

Cross Features

Business Area	Key Feature	Use
Cross Features	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing B2G invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Master Data	VAT cash accounting.
	Withholding Tax	Prepare statements of the withholding tax that you have collected on behalf of your vendors. You can collect tax on a variety of expenditures, in accordance with Spanish law.
Cash	Payment Format	Print checks according to the Spanish standards (SAPscript form F110_ES_CHEQUE).

Business Area	Key Feature	Use
Tax	Deferred Tax	Manage deferred tax transfer and the analysis of deferred tax accounts.
	VAT	Apply pro-rata VAT method in order to determine tax deduction.
	VAT: EC Sales List	Process EC sales list for Spain.
	VAT Reporting	Prepare periodic VAT returns, annual declaration of transactions with 3rd party (form 347) and VAT registers (form 340).

Sweden

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Cash	Payment Format	Convert bank statement into MultiCash format.

Switzerland

Finance

Business Area	Key Feature	Use
Accounts Payable	Payment Reference	Process ISR procedure which is a payment in procedure offered by the Swiss Postal Service to firms based in Switzerland. ISR subscribers are given an ISR number in the business partner master record.

Business Area	Key Feature	Use
Cash	Bank Account Master Data	Maintain bank master data and outline the factors you should consider when transferring bank master data automatically.
	Bank Statement	Convert bank statements into MultiCash format.
General Ledger	Closing Operations and Reporting	Collect and prepare data for Balance of Payments.
Tax	VAT Reporting	Prepare periodic VAT returns.

Turkey

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Number outgoing documents according to your requirements.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Process bills of exchange and checks as forms of payment. You can record, store, and use them according to local legal and business requirements.
Asset Accounting	Inflation Management	Manage inflation accounting by revaluating various assets (and their depreciation) for inflation.
General Ledger	Journal	Process document journal.
	Ledger	Process general ledger from document file.
Tax	VAT Reporting	Process sales ledger and purchases ledger.

Ukraine

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Closing Operations and Reporting	Clear reversed invoice items. Manage automatic clearing.
	Master Data	Manage customer and vendor tax data on a time basis.
	Payables Management	Accounting of down payments in foreign currency. Payments analysis.
	Postings and Documents	Manage internal contract numbers and automatic insertion and update of vendor/customer contracts. Process documents with negative posting.
	Receivables Management	Print invoices. Accounting of down payments in foreign currency. Payments analysis.
	Transfer Pricing	Process transfer pricing to evaluate the transfer of goods or services between independently operating units of a corporate group.
	Trial Balance	Manage customer and vendor turnover balance and balance notification.
Asset Accounting	Closing Operations and Reporting	Process the following for fixed assets: • Create and print forms for acquisition, retirement, scrapping fixed assets • Create and print fixed assets inventory cards • Create and print physical inventory list • Revaluation and the reversal of revaluation
	Master Data	Make settings for localization data.
Cash	Cash Desk	Manage cash journal and print cash documents.
General Ledger	Financial Statement	Prepare financial statements (balance sheet, profit and loss statement, cash flow statement, changes in equity statement).
	Offset Accounting	Process offsetting account determination.
Tax	Corporate Income Tax	Process income tax (known in the system as profit tax) using a separate set of accounting regulations to calculate your taxable profit.
	Tax Invoice	Prepare and process tax invoices and correction tax invoices.

Business Area	Key Feature	Use
	VAT Reporting	Prepare and process VAT reporting.

Supply Chain

Business Area	Key Feature	Use
Inventory Management	Physical Inventory	Carry out the physical inventory for material stocks. Prepare a list of stock on hand at the beginning and end of each period, showing the value of the stock as well as its quantity. Allows the printing of forms required for physical inventory.
	Output Processing	Allows the printing of forms required for goods acceptance, internal goods movement and goods issue processes.
Logistics Execution	Outbound Delivery Processing	Allows the printing of forms required for outbound delivery processing.

Sales

Business Area	Key Feature	Use
Billing and Invoicing	Billing	Allows the printing of invoices.

United Kingdom

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Master Data	Process business partner master data and CIS vendor verification.
	Posting Business Transactions	Process vendor invoices.
	Withholding Tax	Track and remit withholding tax for construction industry scheme.
Asset Accounting	Depreciation	Post revaluation in compliance with the requirements of the Statement of Recommended Practice (SORP) and modified historical cost accounting (MHCA) primarily used by the public sector.
Tax	VAT	Process tax on open invoices.

Business Area	Key Feature	Use
	VAT: EC Sales List	Process EC sales list for the United Kingdom.
	VAT Reporting	Create an electronic value-added tax (VAT) return on sales and purchases.

2.16.3 Africa/Middle East

Key Features

The following tables contain the key features for the countries in Africa and the Middle East.

Egypt

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Manage and record the incoming postdated checks.
	Vendor Certificates	Maintain all information related to vendor certificates in the business partner master for vendor along with information related to its validity.
	Withholding Tax/Stamp Tax	Manage the withholding tax rules and the calculation, and clear its open items to generate the legal remittance form and the tax payment form in accordance with the tax rules and regulations. Manage the stamp tax rules and the calculations, and clear its open items to generate the legal remittance form and the tax payment form. in accordance with the tax rules and regulations.
General Ledger	Company Certificates	Maintain all information related to the company certificates along with information related to its validity.

Israel

Cross Features

Business Area	Key Feature	Use
Cross Feature	Annexing	Enables to adjust a price according to index/currency/price list changes as defined by inflation adjustment law by handling the master data of the annexing packages that are used in the central annexing calculation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Analysis of Payments to Suppliers	Process restrictions in a payment run by managing foreclosures in Accounts Payable and Accounts Receivable.
	Master Data	Update vendor master data with content from Shaam (Computerized Processing Service of the Authorities). Send vendor master data files to Shaam.
	Withholding Tax	Generate withholding tax file.
Asset Accounting	Closing Operations and Reporting	Process revaluation and reporting in asset management.
	Other	Process localized investment plans and asset classification.
Cash	Bank Account Master Data	Process bank master data.
	Cash Processes	Cash system is receivable cash that supports main processes, such as: • Collecting payments (receivable of cash, check deferred check and credit card) • Return (cancellation) of payments • Deposit • Cash audit
Tax	Audit Files	Uniform files and annual file form 6111.
	VAT Reporting	Prepare and process data for the VAT files.

Sales

Business Area	Key Feature	Use
Sales Order Management and Processing	Annexing	Maintain annexing data in sales order.

Business Area	Key Feature	Use
Billing and Invoicing	Annexing	Calculate price in billing documents using annexing formulas.

Source and Procurement

Business Area	Key Feature	Use
Operation Contract Management	Annexing	Maintain annexing data in different purchase document levels such as in scheduling arrangements, Contracts and Requests for Quotation.
Purchase Order Processing	Annexing	Maintain annexing data in different purchase document levels.
Supplier Invoice Verification	Annexing	Create an annexed invoice.

Kuwait

Finance

Business Area	Key Feature	Use	Feature available for:
Accounts Payable and Accounts Receivable	Withholding Tax	Generate statement of withholding tax settlements on dividends earned by entities investing in securities listed in Kuwait Stock Exchange (KSE).	Private Sector
	Vendor Certificate	Maintain all information related to vendor certificates in the business partner master for vendor along with information related to its validity.	Private Sector
	Invoicing	You can create the funds reservation with as many times line items as the agreed number of vendor installments due with the relevant information related to amounts and due dates maintained for each of these installment in the line item. These installment amounts are translated to different line items in the purchase order with different due dates and with reference to the earmarked document line item. At the time of invoicing, it is requested to have the provision of validating that multiple installments for the vendor are not invoiced together in the same invoice.	Public Sector

Business Area	Key Feature	Use	Feature available for:
Asset Accounting	Depreciation	Enclosure with Income tax declaration - Generate statement of assets depreciation in accordance with the county tax rules and regulations.	Private Sector
Cash	Bank Reconciliation	Manage the reconciliation between the bank statements amounts and own accounting records.	Private Sector
General Ledger	Company Certificates	Maintain all information related to the company certificates along with information related to its validity.	Private Sector
Inventory Accounting	Periodic Valuation of Material Inventories	Enclosure with Income tax declaration - generate statement of stock closing inventory at end of the year.	Private Sector
Tax	Corporate Income Tax	Perform an annual income tax and other taxes declaration in accordance with the county tax rules and regulations.	Private Sector

Oman

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Manage and record the incoming postdated checks and manage the outgoing postdated checks through a dashboard.
	Withholding Tax	Manage the withholding tax rules and the calculation, and clear its open items to generate the legal remittance form in accordance with the tax rules and regulations.
	Vendor Certificates	Manage and record the incoming postdated checks and manage the outgoing postdated checks through a dashboard.
Tax	Corporate Income Tax	Manage income tax declaration.

Qatar

Finance

Business Area	Key Feature	Use	Feature Available for:
Accounts Payable and Accounts Receivable	Bill of Exchange	Manage and record the incoming postdated checks.	Private Sector
	Withholding Tax	Manage the withholding tax rules and the calculation, and clear its open items to generate the legal forms (remittance, vendor certificate, refund) in accordance with the tax rules and regulations.	Private Sector
	Vendor Certificates	Maintain all information related to vendor certificates in the business partner master for vendor along with information related to its validity.	Private Sector
	Payment	You can print payment forms that meet legal requirements.	Public Sector
	Payment Receipt	Manage receipt vouchers: create, edit, display and approve receipt vouchers.	Public Sector
	Payment request	You can create, edit, or display payment requests.	Public Sector
	Expense Statement	You can generate an expense statement that contains details of all payment transactions carried out in a fiscal period, for a specific expense G/L account or a range of expense G/L accounts.	Public Sector
Asset Accounting	Depreciation	Enclosure with income tax declaration - generate a statement of assets depreciations in accordance with the tax rules and regulations.	Private Sector
Cash	Bank Reconciliation	Manage the reconciliation between the bank statement amounts and own accounting records.	Public Sector
General Ledger	Provision	Enclosure with income tax declaration - generate a statement of company provisions details in accordance with the tax rules and regulations.	Private Sector

Business Area	Key Feature	Use	Feature Available for:
	Trial Balance	You can create and define account groups based on first digits of the account number. You can use several levels of detail by specifying the trial balance level.	Public Sector
Tax	Corporate Income Tax	Perform an annual income tax declaration in accordance with the tax rules and regulations.	Private Sector

Saudi Arabia

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use	Feature Available for:
Accounts Payable and Accounts Receivable	Bill of Exchange	You can process postdated checks.	Private Sector
	Withholding Tax	You can generate the monthly and annual withholding tax declaration and create withholding tax certificates form.	Private Sector
	Vendor Certificate	You can maintain all information related to vendor certificates in the business partner master for vendor along with information related to its validity.	Private Sector

Business Area	Key Feature	Use	Feature Available for:
	Payment Order	You can create payment documents for expenditure orders using the following two payment types: Ministry of Finance (MoF) and Internal Transfer. Payments with amount greater than the threshold amount configured for Internal Transfer payments need to be created as MoF Payment documents using the MoF payment type. The value of this threshold amount is generally specified as 20,000 SAR by the MoF. You can create, edit, or display payment orders.	Public Sector
	Expenditure Order	Expenditure orders are generated by posting documents with sources Financial Invoice (FI), Material Management (MM), Beneficiary Advances, or Employee Advances, using standard posting transactions such as FB60 and MIRO. These transactions are localized to include the KSA-specific fields at the header and line item level. You can create, edit, or display expenditure orders.	Public Sector
Asset Accounting	Depreciation	Enclosure with Zakat and Income tax declaration - Generate statement of assets depreciation in accordance with the county tax rules and regulations.	Private Sector
Tax	Corporate Income Tax	Perform an annual Zakat and income tax declaration and enclosures in accordance with the county tax rules and regulations.	Private Sector

South Africa

Finance

Business Area	Key Feature	Use
Tax	VAT Reporting	Process sales and purchases ledger reporting.

United Arab Emirates

Finance

Business Area	Key Feature	Use	Feature Available for:
Asset Accounting	Asset Acquisitions and Asset Retirements	You can generate a certificate of ownership for items capitalized to the asset master record. To produce this certificate, you can evaluate the goods receipt, invoice, purchase order and clearing document for the items. You can also display the unit price of the item and the current capitalized asset value.	Public Sector
Cash	Payment Medium Formats	You can use payment medium formats when generating payment files.	Public Sector Private Sector
Tax	Audit File	You can prepare the VAT Audit File, called FAF Return that contains line level details of tax-relevant documents posted and provides information on the base amount and calculated tax amount for purchases, sales, and for each general ledger account to which tax-relevant documents are posted.	Private Sector
Accounts Payable and Accounts Receivable	Bill of Exchange	Manage and record the incoming postdated checks.	Private Sector
	Vendor Certificates	Maintain all information related to vendor certificates in the business partner master for vendor along with information related to its validity.	Private Sector

2.16.4 Asia-Pacific

Key Features

The following tables contain the key features for the countries/regions in Asia-Pacific.

Australia

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Report generic withholding tax.

China

Cross Features

Business Area	Key Feature	Use
Cross Feature	Official Document Numbering	Ensure consecutive numbering for financial documents.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Manage the whole life cycle of various BoE receivable and payables, including master data, process and status management, reports and counting.
	Monitoring of Receivables and Payables	Aging reporting, customer summary and details reporting, vendor summary and details reporting.
Cash	Cash Budgeting	Manage all cash budgeting for China including configuration, data preparation, cycles and approvals, budget consumption and reports.
	Cash Desk	Report for historical cash flow and movements in a specified period.

Business Area	Key Feature	Use
	Electronic Payment Integration (EPIC)	Process incoming and outgoing payment management and cash operations for China.
General Ledger	Closing Operations and Reporting	Process compiling a collective balance of payments.
	Financial Statement	Manage and display localized financial statements (profit and loss statement, balance sheet, cash flow statement).
	G/L Account Balance	Display G/L account balance and line items in general ledger.
	Offset Accounting	Determine offset accounts for cash flow statement.
	GR/IR Analysis	Analyze details of goods received but invoice not received, and invoice received but goods not received.
	Journal	Print financial documents according to China-specific format.
	Master Data	Manage master data related to account levels hierarchy.
Tax	Golden Tax Interface	Manage pre-processing of invoicing data with splitting, merging, rounding handling, and so on, and generate invoicing files for invoicing and printing to Golden Tax System.
	Global Trade	Manage the tax refund process of exporting goods, including the FI posting of accrued refundable VAT and consumption tax.

India

Cross Features

Business Area	Key Feature	Use
Cross Feature	Manage Master Data	You can manage/migrate tax-relevant master data of a business partner. This data includes excise duty, service tax, and withholding tax data.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document submission by a custom solution for the outgoing invoicing process.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Postings and Documents	Post and clear vendor down payments.
	Withholding Tax	Enables you to process withholding taxes (also known as tax deducted at source or TDS) including clearing according to the Income Tax Act, 1961. Enables you to prepare tax return in the form as required by the tax authorities.
Asset Accounting	Closing Operations and Reporting	Manage fixed assets reporting
	Depreciation	Calculate depreciation on asset blocks as required by the income tax laws in India.
	Master Data	Make settings for localized master data.
Tax	Corporate Income Tax	Calculates and displays the income tax depreciation and capital gain and capital loss values for asset blocks. Additionally updates the closing written down value (WDV) of an asset block.

Sales

Business Area	Key Feature	Use
Billing and Invoicing	Excise Duty	You can determine excise and other taxes on your sales, and make the appropriate accounting posting.

Source and Procurement

Business Area	Key Feature	Use
Invoice Management	Excise Duty	You can calculate excise duty either using a condition-based method or a formula-based method. Additionally, you can prepare copies of all excise registers for submission to excise authorities.
Supplier Management	Subcontracting Challan	You can handle materials issued to subcontractor without payment of excise duty or with full payment of excise duty.

Indonesia

Cross Features

Business Area	Key Feature	Use
Cross Feature	Business Place	Manage the activation of business place.
	Official Document Numbering	Manage document classes and number range maintenance in official document numbering.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Closing Operations and Reporting	Process application configuration for reporting.
	Withholding Tax	Enable you to file a withholding tax return on a monthly basis
General Ledger	Closing Operations and Reporting	Process compiling a collective balance of payments.
	Offset Accounting	Determine offsetting accounts to prepare the cash flow statement using the direct method.
Tax	VAT Reporting	Process advance returns for tax on sales and purchases.

Japan

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	For the scenario of Electronic Monetary Claim (Issuer), record bill of exchange transactions according to your requirements.
	Invoice Summary	Process the invoice summary, according to Japanese requirements, for the following document types: invoices, credit memos, and down payment requests.
	Withholding Tax	Process generic withholding tax report for certain kinds of payments that are subject to withholding taxes.
Asset Accounting	Closing Operations and Reporting	Annex 16 (1)(2)(4)(6)(8) - Supplemental forms for a corporate tax declaration to explain depreciation expense.

Business Area	Key Feature	Use
	Depreciation	Calculate tax depreciation of fix assets and J-GAAP depreciation of impaired assets.
Cash	Bank Statement	Import Zenginkyo bank statements.
	Payment Format	Process bank charge calculation. Domestic bank transfer and foreign bank transfer in Zenginkyo format.
Tax	Property Tax	Forms for property tax declaration with each municipal tax office each year.

Sales

Business Area	Key Feature	Use
Sales Order and Outbound Delivery	Expiration Date Management – Batch Inversion Check	You use this automatic batch inversion check to prevent the shipment of products from batches that are older than the previous shipments to the same customer. The batch inversion check takes place during the creation or modification of sales orders and outbound deliveries.
Sales Order	CHOAI Route Management	In case that business flow (document flow) and logistics flow are multi-steps and Hierarchical to the final consumer, the Hierarchy information (CHOAI Route) is necessary for subsequent processes, like rebate calculation. You can define CHOAI Route and can create a new sales order with specifying CHOAI Route.

Sourcing and Procurement

Business Area	Key Feature	Use
Purchase Order Processing	Purchase Orders with Temporary Pricing	You can order materials from the suppliers by creating a purchases order with estimate prices and adjust the goods prices after they have been negotiated. Prices are fixed before goods receipt.

Malaysia

Finance

Business Area	Key Feature	Use
Tax	Deferred Tax	Process deferred tax transfer and analyze deferred tax accounts.

Business Area	Key Feature	Use
	Goods and Service tax	Process GST-03 reporting.

New Zealand

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Cash	Payment Format	Enable you to generate the payment file you send to your bank according to your format settings.

Philippines

Cross Features

Business Area	Key Feature	Use
Cross Features	Business Place	Manage the activation of business place.
	Official Document Numbering	Manage document classes and number range maintenance in official document numbering.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Withholding Tax	Process withholding tax according to your requirements.

Business Area	Key Feature	Use
Tax	Payment Receipt	Official receipt printing and management.
	VAT Reporting	Process advance returns for tax on sales and purchases.

Singapore

Cross Features

Business Area	Key Feature	Use
Cross Feature	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Asset Accounting	Closing Operations and Reporting	Manage fixed assets reporting.
	Depreciation	Calculate tax depreciation of fix assets.
Tax	VAT Reporting	Process advance returns for tax on sales and purchases.

South Korea

Cross Features

Business Area	Key Feature	Use
Cross Features	Business Place	Manage the activation of business place.

Business Area	Key Feature	Use
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Record bill of exchange transactions according to your requirements.
	Master Data	Manage time-dependent Korean-specific fields in customer/vendor master records (including one time customers/vendors).
	Withholding Tax	Manage generic withholding tax reporting and maintain withholding tax details. You can use section code (assign tax office number and local tax office number).
Asset Accounting	Closing Operations and Reporting	Control the depreciation due on your assets, including any sibuin postings.
	Depreciation	Prepare statements of the depreciation on assets in the format required by the local authority.
General Ledger	Trial Balance	Manage trial balance and line items in general ledger.
Tax	Closing Operations and Reporting	Prepare taxes and dues/prepaid expenses.
	Tax Invoice	Process tax invoices for all sales and other transactions involving output tax, and record incoming tax invoices for all purchases or other transactions involving input tax.
	VAT Reporting	Process sales and purchases ledger reporting.

Taiwan

Cross Features

Business Area	Key Feature	Use
Cross Features	Business Place	Manage the activation of business place.
	Official Document Numbering	Manage document classes and number range maintenance in official document numbering.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Tax	VAT Reporting	Process sales and purchases ledger reporting.

Thailand

Cross Features

Business Area	Key Feature	Use
Cross Features	Business Place	Manage the activation of business place.
	Official Document Numbering	Manage number groups and number range maintenance in official document numbering.
	Electronic Document	Enable the processing of electronic documents by doing the following: • Extracting the relevant data from documents created on source applications. • Monitoring the process steps related to electronic document preparation.

Finance

Business Area	Key Feature	Use
Accounts Payable and Accounts Receivable	Bill of Exchange	Record bill of exchange transactions according to your requirements.
	Correspondence	Manage your correspondence according to the local business and legal requirements.
	Deferred Tax	Transfer deferred tax.
	Withholding Tax	Manage generic withholding tax reporting.
Asset Accounting	Depreciation	Prepare statements of the depreciation on assets in the format required by the local authority.
Tax	VAT Reporting	Process advance returns for tax on sales and purchases.

Supply Chain

Business Area	Key Feature	Use
Inventory Management	Reports	Additional reports are provided in inventory management for reporting, as required by local authorities.

3 SAP S/4HANA Enhanced LoB Functions

SAP S/4HANA Enhanced LoB Functions enhance core functions of SAP S/4HANA Enterprise Management to provide additional business benefit for your line of business (LoB). Please note that you might need a separate license. For further information, please contact your SAP Account Executive.

3.1 Asset Management

3.1.1 Maintenance Management

3.1.1.1 Work Clearance Management

Business Background

By using work permits, you can make sure that safety measures for carrying out certain kinds of maintenance work are complied with and that safety barriers are not removed or shut down unless measures are taken to ensure safety during the maintenance work. The work permit serves as an operational safety barrier to help protect workers and prevent accidents.

A work permit is a written document that authorizes specific persons to carry out specific work at a specific time. It describes both the work to be carried out and the requirements that must be fulfilled. At the same time, it ensures that the technician cannot start working until all the required and appropriate safety measures have been taken. It is the duty of everyone involved in the planning, approval, and execution of the maintenance work to evaluate whether or not a work permit is required.

Key Features

The following features support you with this process:

Key Feature	Use
Creating a work permit for a maintenance order	You can create a work permit for a maintenance order. One order can have several work permits, typically separated according to validity, risk categorization, or job-related semantics.

Key Feature	Use
Defining work permits with restricted validity	Work permits might have a restricted validity (for example, for one day only). In such cases, an ongoing maintenance order to be continued the next day would then require a new work permit. If appropriate, the new permit could be copied based on an existing one (and slightly adapted in case of changed safety considerations) and would have to be approved again.
Defining work permits for predefined risk levels	Work permits might be categorized by risk level. For example, level 1 could be for highly-critical work requiring strong protection and/or coordination measures, level 2 could be for less critical work. If a maintenance order requires both highly-critical repair work and less critical cleaning work for example, it would be appropriate to assign two separate work permits (one level 1, one level 2) to this order. Note that you can also combine different risk levels with different validities. In the Oil & Gas industry, for example, it is common to distinguish between two levels of work permits as follows: • Work permits of level 1 are used for work that involves high risks and hazards. This work requires a comprehensive safety and approval process. It includes hot work, work in an area with special entry restrictions, and so on. Level 1 work permits are usually valid for only one working shift. An extension of the work permit is only possible under certain conditions (for example 4 hours). Afterwards, the work permit can no longer be extended. If the work is not yet completed at this point in time, a new work permit must be applied for. • Work permits of level 2 are used for all work with lower risks/hazards. This work must also be completed within a predefined time period, although the time period is defined more generously (for example 14 days).
Defining work permits for dedicated safety aspects	Work permits might also be separated by dedicated semantic safety aspects, determined by the maintenance job to be executed. In case of huge maintenance orders with multiple job tasks, it might therefore be necessary to apply for multiple work permits representing safety for the different semantic aspects (such as a radiation permit and a hot work permit).
Creating a safety certificate for a work permit	In case of more extensive safety aspects to be covered by a work permit (requiring an individual planning, approval, or execution process), it is appropriate to assign dedicated safety certificates to the work permit that describe such safety aspects in detail. A common example for such a safety certificate is an isolation list (such as an electrical isolation list or a valve & blind list) specifying all the technical objects of an asset that need to be processed/switched in conjunction with a lockout/tagout.
Approving work permits and safety certificates	Approvals are used to define certain rules or requirements that must be observed during processing of both work permits and safety certificates. In particular, you can use approvals as follows: • To explicitly confirm the execution of certain safety-related activities (by issuing the respective approval) • To block certain activities (until the required approval has been issued) • To clearly visualize that all described safety measures have been executed (as soon as all respective approvals are issued) and maintenance work can be performed safely

Key Feature	Use
Processing isolation lists	This process consists of switching (for example, tagging/untagging) technical objects specified in an isolation list so that work and tests can be performed safely. To ensure that the lockout/tagout process can be performed safely and without conflicts, the system provides checks and simulations.

3.1.1.2 Linear Asset Management

Business Background

You use linear asset management to manage the entire lifecycle of linear assets like roads, rails, pipelines, or electricity transmission lines. The process will help you to optimize the reliability, availability, maintainability, and safety of the networks and infrastructure you are responsible for. Linear asset management is a comprehensive, integrated process that facilitates and connects linear asset management activities with enterprise processes and data. In addition, the process helps you to improve asset management effectiveness, efficiency, and strategy, thereby boosting asset reliability and return on investment.

Key Features

The following features support you with this process:

Key Feature	Use
Managing infrastructure	You can manage infrastructure networks of continuous assets and make use of flexible dynamic segmentation functionality to visualize the network and assets configuration.
Defining and controlling	You can define and control asset configuration, capacity, capability, and condition in one database, and automate asset lifecycle management in complex operational environments.
Managing master data	You can manage master data about critical network assets that helps cut asset downtime, and saves time that used to be spent searching multiple systems and files for documents such as maintenance procedures and drawings.

3.1.1.3 Geographical Enablement Framework for Asset Management

Business Background

Geographical Enablement Framework for Asset Management enables you to gain a comprehensive overview of your business data. You can see EAM business objects (pieces of equipment, functional locations, maintenance orders, and maintenance notifications) on a map that allows you to analyze your data in a geographical context.

Key Features

The following table explains the available key features:

Key Feature	Use
Display and Find Business Objects on the Map	You can display and find business objects with assigned geospatial data on the map.
Assign Geospatial Data to Technical Objects (Manual and Automatic)	When you create a technical object (piece of equipment, functional location) or a maintenance document (maintenance order, maintenance notification), the system can copy the geospatial data automatically to the created business object. In addition, you can also copy the geospatial data manually.
Initiate a Business Process from a Map	You can select a single technical object or a maintenance document on the map and the system processes it further. In addition, you can initiate your business processes from the map by selecting multiple maintenance orders or maintenance notifications.

3.1.1.4 Integration with Asset Central

Business Background

SAP S/4HANA supports the integration with Asset Central (currently Asset Intelligence Network). You can transfer your technical objects with their details into Asset Central.

Key Features

The following table explains the key features available:

Key Feature	Use
Technical object details	The system supports the navigation to Asset Central to view details on the technical object.
Technical object references	You can create references from technical objects in SAP S/4HANA to a corresponding model in Asset Central.
Data synchronization	You can create a technical object and synchronize it with the Asset Central equipment or location and vice versa.
Document synchronization	You can transfer document attachments between Asset Central and SAP S/4HANA.
Notification replication	You can transfer maintenance notifications between Asset Central and SAP S/4HANA.
Work order replication	You can transfer work orders from SAP S/4HANA to Asset Central.
Asset Central information in SAP S/4HANA	You can display Asset Central-related information in specific SAP S/4HANA applications.

3.1.2 Resource Scheduling

3.1.2.1 Resource Scheduling

Business Background

Resource scheduling provides you, as a maintenance planner, with insights into your maintenance workload and available capacities for current and upcoming maintenance activities. Use resource scheduling to check current and forecasted work center utilization, build one or more schedules for a specific period, and level work center utilization before dispatching the scheduled work.

Key Features

The following features support you with this process:

Key Feature	Use
Get an overview of KPIs related to maintenance planning	You can monitor important KPIs for your work centers, such as the following: • Number of maintenance orders that have at least one due operation in one of your work centers, sorted by priority • Utilization of your work centers • Number of maintenance orders that have at least one unconfirmed operation with an end date in the past 6 months, sorted by processing status • Hours of work in your work centers that have not yet been assigned to a person responsible, sorted by priority
Gain transparency about the current utilization of your work centers	You can see at a glance which of your work centers are overloaded and which still have free capacity. Utilization of your work centers is calculated based on the available work center capacity and the maintenance order operations, suboperations, and scheduled maintenance plans that are assigned to them.
Visualize current work center utilization based on various attributes	You can graphically show work center utilization based on various attributes, such as work center, processing status, priority, or order type.
Dispatch one or multiple order operations	Dispatch maintenance order operations and suboperations with one click to confirm that they are scheduled at the right place and time.
Level work center utilization by moving order operations to another date or work center or by adjusting work center capacity for a specific week	You can change the start date and work center for one or multiple order operations at once, for example, to level capacity for overloaded work centers. You can also adjust the number of resources per work center and shift to accommodate fluctuations in workload for a specific week.
Visualize the maintenance work for your work centers	You can visualize on a timeline the maintenance order operations and suboperations in your work centers as well as their processing status, thus gaining transparency about what needs to be done when.
Create and delete relationships between order operations	You can show implicit and explicit relationships between order operations in a Gantt chart. The visualization of relationships helps you to detect relationship violations and scheduling conflicts before dispatching order operations. You can also create and delete relationships between order operations.
Visualize the final due date of orders	You can show the final due date of orders. The visualization of final due date of an order helps you to schedule its operations to be completed before this date.
Create one or more schedule simulations for a schedule period and check the forecasted utilization at weekly and daily level	You can set up one or more schedules for a specific schedule period. Checking the utilization forecast at weekly level and at daily level, you can keep adjusting your schedule until you are ready to freeze the final schedule.

Key Feature	Use
Use manual and automatic scheduling to find the best time slot for the order operations in a schedule	Using manual scheduling, you set a start date, and optionally time, for selected order operations. A scheduling algorithm then finds the best time slot for each operation. You can drag and drop an order operation on a timeline to schedule it manually. With automatic scheduling, both start date and time slot are determined by the algorithm.
Track and review schedule attainment	You can freeze a schedule to create a snapshot of it. This allows you to monitor the completion of order operations and to track schedule attainment once the schedule period starts. When the schedule period is over, you can review schedule attainment to continuously improve your scheduling skills.
Assign a person responsible to order operations	You can assign a person responsible to the order operations in your work centers. You can also change the person responsible that is currently assigned to an operation or delete the assignment.
Collaborate on a schedule	You can share a schedule to collaborate with other maintenance planners and with reviewers. While all planners have full permissions for the schedule, reviewers cannot make any changes to the schedule. Commenting allows all planners and reviewers to submit and track feedback on shared schedules.
Keep track of changes and activities that affect a schedule	An activity log helps you to keep track of changes and activities that happened at schedule level and at the level of the order operations in the schedule.
Visualize assets in their hierarchical structure and show the maintenance schedule for assets	You can view assets (functional locations and pieces of equipment) in their hierarchical structure, including all subassets and associated maintenance orders and maintenance items. In addition, you can visualize upcoming maintenance work on a timeline to quickly see when an asset is under maintenance and whether the maintenance work requires asset downtime.

3.2 Database and Data Management

3.2.1 Enterprise Information Management

3.2.1.1 Master Data Management

3.2.1.1.1 Master Data Governance

Business Background

Master Data Governance (MDG) reliably supports you in keeping your master data consistent even in complex system landscapes that are distributed across various locations. MDG enables you to adjust your master data quickly to reflect legal changes, track changes, and respond flexibly to new requirements and to business transactions such as takeovers of other companies. With MDG, you can replicate master data to other systems. You can also import master data from external systems to validate and to improve the imported master data in MDG on SAP S/4HANA. In addition, MDG provides recommendations how to integrate supplier master data (with SAP Ariba Supplier Lifecycle and Performance, for example) and how to integrate customer master data (with SAP Cloud for Customer (C4C), for example).

MDG, central governance provides central ownership of master data in line with a company's business rules and processes. MDG delivers domain-specific, out-of-the-box applications as well as a framework for custom-defined master data. MDG offers change request-based processing of master data with integrated workflow, staging, approval, activation, and distribution. MDG can be deployed as a separate hub system, or co-deployed with SAP S/4HANA. In both cases, MDG can use SAP and company-specific business logic to create master data ready to be used in a company's business processes.

MDG, consolidation delivers capabilities to load master data from different sources, to standardize the master data, and to detect duplicates. For each of the determined match groups, *MDG, consolidation* calculates a best record from the duplicates in that group based on survivorship rules for the master data attributes. You can then use these best records in dedicated analytical or business scenarios.

Within MDG, you can combine consolidation and central governance to support various master data management scenarios, like initial load of master data as a starting point for central governance, consolidation of master data after mergers and acquisitions, or combinations where you keep de-central ownership of master data in some parts of the company while centralizing master data ownership in other parts.

MDG, mass processing enables you to update multiple master data records at a time. To update records, you select the fields and records you want to change. The system then provides statistics on the changed fields and validates the data for business transaction use before activating the changes.

MDG, data quality management enables you to define data quality rules and data quality key performance indicators (KPIs). You can evaluate the quality of your master data according to these rules and monitor the current state of the data quality as well as its trend. The rules can be used for data quality evaluation, check in change requests, check in consolidation, and check in mass processing. Rule mining enables you to use machine learning for data analysis and for the creation of data quality rules from mined rules. You can use derivation scenarios to deduce master data based on rules to ensure data quality.

Process analytics for master data provides overview pages and analytical list pages showing relevant process information for applications in central governance, consolidation, and mass processing.

Key Features

The following table shows the key features and which applications they are available for:

Key Feature	Use
Master Data Governance, Central Governance	Available in the following central governance applications: • Master Data Governance, Generic Functions • Master Data Governance for Custom Objects • Master Data Governance for Financials • Master Data Governance for Material • Master Data Governance for Business Partner • Master Data Governance for Supplier • Master Data Governance for Customer
Master Data Governance, Consolidation	Available in the following consolidation applications: • Master Data Governance for Custom Objects • Master Data Governance for Product • Master Data Governance for Business Partner • Master Data Governance for Supplier • Master Data Governance for Customer
Master Data Governance, Mass Processing	Available in the following mass processing applications: • Master Data Governance for Custom Objects • Master Data Governance for Product • Master Data Governance for Business Partner • Master Data Governance for Supplier • Master Data Governance for Customer
Master Data Governance, Data Quality Management	Available in the following data quality management applications: • Master Data Governance for Custom Objects (derivation scenarios are not supported) • Master Data Governance for Product • Master Data Governance for Business Partner • Master Data Governance for Supplier • Master Data Governance for Customer

Key Feature	Use
Process Analytics for Master Data	Available in the following central governance applications: • Master Data Governance for Financials • Master Data Governance for Material • Master Data Governance for Business Partner Available in the following consolidation applications: • Master Data Governance for Product • Master Data Governance for Business Partner Available in the following mass processing applications: • Master Data Governance for Product • Master Data Governance for Business Partner

3.2.1.2 Data Quality Management

Business Background

SAP S/4HANA supports the integration with address cleansing solutions (for example, SAP Data Services or SAP HANA smart data quality) to provide postal address validation.

Key Features

When a complex address cleansing solution (for example, SAP Data Services or SAP HANA smart data quality) is integrated and supports the below named features, SAP S/4HANA enables the address cleansing solution to provide the following key features:

Key Feature	Use
Postal address validation	When you enter a new customer, supplier, or partner record, Data Quality Management corrects and/or validates the address based on referential data sources, and formats the address according to norms of the applicable country/region.
Duplicate checking and error-tolerant searching	Duplicate checking ensures that duplicate addresses are not entered into the SAP system when users create a new address record or update an existing one. Error-tolerant searching allows users to find customer records using partial information.
Person and organization name cleansing	Person name cleansing standardizes various components related to a person's name. Organization cleansing standardizes the names of firms, companies, and organizations.

When a simple address cleansing solution (for example, SAP Data Quality Management, microservices for location data) is integrated and supports the below named features, SAP S/4HANA enables the address cleansing solution to provide the following key feature:

Key Feature	Use
Postal address validation	When you enter a new customer, supplier, or partner record, Data Quality Management corrects and/or validates the address based on referential data sources, and formats the address according to norms of the applicable country/region.

3.3 Finance

3.3.1 Financial Planning and Analysis

3.3.1.1 Financial Planning and Analysis

The component, which provides functionalities for financial planning and analytics within S/4 HANA, is called **SAP BPC for S/4HANA**.

Business Background

To effectively control and monitor your company, you need easy-to-use planning capabilities and up-to-date analytics. With financial planning, you set plans for your financial units, such as profit centers or market segments. At the end of the planning period, you compare the actual data with the plan data to determine the success of the financial units.

Key Features

The following table explains the key features available:

Key Feature	Use
Integrated Financial Planning	SAP BPC for S/4HANA provides a **central, integrated place** for all financial planning data. It also provides real-time access to master data and actual data.
Financial Planning using Microsoft Excel	You can perform financial planning using **Microsoft Excel** and **SAP BusinessObjects Analysis, edition for Microsoft Office**. SAP provides various applications for planning on fiscal years or fiscal periods. You can adapt these planning applications according to your needs.

Key Feature	Use
Integration to S/4HANA Planning Functions	You can use a large set of planning functions available within SAP BPC for S/4HANA, such as top-down distribution or recalculations. To perform planning functions in the SAP Business Suite, you can copy the planning data from SAP BPC for S/4HANA to the SAP Business Suite. You can afterwards copy the data back to SAP BPC for S/4HANA to use its SAP HANA-enabled reporting capabilities.
SAP HANA-Enabled Reporting	Reports on plan data and actual data are **HANA-enabled** to provide real-time access and flexible analysis capabilities.
Sample Content	We provide sample BI content for planning and reporting that you can **use as it is** or **adapt it** according to your needs. This sample planning content, for example, contains workbooks which allow you to plan on various cost objects with a focus on overhead accounting. There are other workbooks with which you can perform various types of plan data allocation.

3.3.2 Accounting and Financial Close

3.3.2.1 Central Finance

Business Background

With Central Finance you can transition to SAP S/4HANA without disruption to your current system landscape, which can be made up of a combination of SAP systems of different releases. This allows you to establish a central reporting platform for financial accounting (FI) and management accounting (CO) with the option of creating a common reporting structure. Additionally, selected financial processes can be performed in the Central Finance system.

Key Features

The following table explains the key features available:

Key Feature	Use
Harmonized Financial Reporting	Central Finance allows you to map to a common reporting structure with which you can report on financial figures originating in different source systems, benefiting from the new reporting capabilities (leveraging HANA and the new data model) in the Central Finance system.

Key Feature	Use
Simplified Mergers and Acquisitions	Using Central Finance, the systems of acquired companies can be integrated more easily.
Replication of FI and CO Postings	Financial accounting (FI) and management accounting (CO) postings are replicated to the Central Finance system. For SAP ERP source systems, where FI documents and CO postings are separate documents, they are combined into one document in the Central Finance system; the universal journal entry. In addition, all cost elements are part of the chart of accounts.
Replication of Cost Objects	Before you replicate CO postings, you need to make sure that accounts are available for all cost elements in the Central Finance system. You can also replicate certain types of cost objects (for example, internal orders) to the Central Finance system. These represent the business transactions in logistics (for example, production, maintenance, and quality) and may not be at an appropriate granularity in the Central Finance system. For this reason, you can choose to transfer some cost objects, such as long-living internal orders, directly to orders and to map other cost objects, such as short-living production orders, to more long-living cost objects, such as a production cost collector, in the Central Finance system.
Replication of EC-PCA Postings	Internal postings within profit center accounting (EC-PCA) are replicated to your Central Finance system. In the Central Finance system, an EC-PCA posting becomes an FI posting (universal journal entry) in a dedicated ledger.
Replication of Commitments	Commitments and commitment updates are replicated in real time from one or more source systems to your Central Finance system, allowing you to also report on committed amounts in your cost object reports.
Replication of Activity Rates	You can replicate planned activity rates created in source systems to the Central Finance system and those created in Central Finance back to your source systems. Changes to activity rates in one system also trigger updates to the activity rate in the corresponding source or Central Finance system. If a primary cost component split exists for a certain activity rate, the cost component split data is replicated together with the activity rate.
Replication of Material Cost Estimates	You can replicate material cost estimates from source systems to the Central Finance system. For a mixed costing, the material cost estimates are replicated together with the relevant procurement alternatives.
Mapping of Accounting Entities	You can map the various accounting entities in your source systems to one common set of master data in the Central Finance system.
Error Handling	In Central Finance, errors that occur in the replication scenarios are recorded using the error handling functions of SAP Application Interface Framework (for more information, see the section of this document entitled **Integration and Connectivity**).

Key Feature	Use
Account-to-Ledger Solution	Central Finance supports the connection of source systems that use parallel accounting with accounts to a Central Finance system which uses parallel accounting using ledgers, the standard approach in SAP S/4HANA.
Document Splitting	Central Finance supports document splitting for replicated source documents, even if it is not active in the source system. Document splitting checks can be carried out in both source and target systems.

Central Payment	Central Payment allows you to make centralized payments and perform centralized clearing activities in the Central Finance system instead of each source system. It contains the following main features:
	• Activate central payment by company code.
	• For company codes that are activated for central payment, new invoices posted in the source systems are technically cleared. The invoices are replicated to the Central Finance system and are paid there.
	• For company codes that are not activated for central payment, the invoices posted in source systems stay open and are paid in the source systems. The invoices and payment or clearing documents are replicated to the Central Finance system for reporting purposes. The replicated invoices are ruled out from the payment or clearing transactions in the Central Finance system. This prevents duplicate payments being made for items that should be paid in the source system.
	• SEPA Mandate replication between source systems and the Central Finance system is automated so that SEPA direct debit is supported in the Central Finance system.
	• Integration of SD-related down payments into Central Finance, allowing you to do the following in your Central Finance system, instead of in your source systems:
	  ○ Make down payments related to a sales order (condition-based or request-based)
	  ○ Carry out clearing activities for down payments and invoices
	• Integration of MM-related down payments into Central Finance, allowing you to do the following in your Central Finance system, instead of in your source systems:
	  ○ Post down payments with reference to a down payment request replicated from a source system (request-based)
	  ○ Carry out clearing activities for down payments and invoices separately

Key Feature	Use
Central Tax Reporting	As payments may adjust the indirect taxes calculated when the invoice was posted, it can become necessary to report indirect taxes from the Central Finance system when Central Payment is activated. **i Note** Calculation of taxes from your SAP S/4HANA Central Finance system and any reporting based on this calculation covers a certain scope and may not meet all of the reporting requirements in your jurisdiction. You must check with your accounting or tax experts in order to make sure that the results generated by Central Tax Reporting are fully compliant with your relevant jurisdictions' specific tax reporting requirements. For information on which tax reports are supported in Central Tax Reporting, see the documentation on the SAP Help Portal.
Central Statutory Reporting	Central Finance supports certain country/region-specific statutory reports.
Central Projects (WBS)	The *Central Projects (WBS) - Reporting* scenario allows you to subsequently post FI documents (journal entries) and CO documents with the account assignment to a work breakdown structure (WBS) element and use the project reporting on costs and revenues posted to WBS elements in the Central Finance system. The *Central Projects (WBS) - Asset Settlement* scenario allows you to settle costs posted to a work breakdown structure (WBS) element in a source system to an asset under construction (AuC) and finally to a fixed asset within the Central Finance system.
Central Budgeting	In a Central Finance scenario, Central Budgeting for Internal Orders as well as for Projects allows you to take a centralized approach and manage budget, tolerance limits and availability control in the Central Finance system. Budget which is typically consumed in a process carried out in the source system is checked against the budget and budget-related Customizing defined in the Central Finance system.
Central Accruals Management	The Accrual Engine on the Central Finance system calculates and posts the purchase order accruals in the Central Finance system. Relevant purchase order information is replicated in real time from your source systems to the Central Finance system.
Navigation	There are possibilities to navigate from the Central Finance system to the corresponding source system(s) and vice versa. Such capabilities are applicable on selected SAP Fiori apps and transactions in SAP GUI.

Key Feature	Use
Cross System Process Control (CSPC)	Cross System Process Control allows the smooth and consistent flow of business processes that are distributed across different systems. These business processes involve the journal entries that have been replicated between the systems within your Central Finance scenario. It ensures that a process is **not** permitted in one system if it conflicts with a process being carried out in another system. With the activation of Central Payment, certain business processes, such as payments and clearings, are distributed across systems. Cross System Process Control prevents, for example, an invoice from being reversed in the source system if the corresponding journal entry has already been cleared in the Central Finance system.
Configuration Consistency Checks	You can use this report to check whether configuration settings in the source system are compatible with the configuration settings in the Central Finance system.

Related Features

It is also possible to connect SAP S/4HANA Cloud editions as a source system. For additional information about connecting the SAP S/4HANA Cloud system, contact SAP.

For the connection of third-party source systems, you can use the third-party system interface. To simplify the integration of third-party source systems, there are also the following solution extensions available:

- SAP Central Finance Transaction Replication by Magnitude
- SAP Central Finance Data Harmonization by Magnitude

3.3.2.2 Joint Venture Accounting

Business Background

Companies typically form joint venture partnerships to minimize risks involved in capital intensive operations that demand a long payback period. A joint venture partnership consists of an operating partner (operator) and one or more non-operating partners who combine monetary or personnel resources to share a project's expenses. The operator manages the venture, arranges venture activities, and maintains accounting records to generate accurate partner billing documents. The operator remits venture expenses and distributes these to the partners, according to their ownership shares. SAP JVA is a complete accounting system for joint ventures and captures all expenditures and other joint venture transactions by using functions from Financial Accounting (SAP FI), Controlling (SAP CO), Asset Management (SAP AM), Materials Management (SAP MM), Asset Accounting (SAP AA), and Enterprise Portfolio and Project Management (SAP EPPM).

Key Features

The following table explains the key features available:

Key Feature	Use
Master Data Maintenance	As operator you maintain the joint venture master data and ensure the accurate processing according to the joint operating agreement (JOA). Venture, joint operating agreement, joint venture partner master data, and venture attributes defined in the configuration ensure the proper integration with SAP Finance cost objects and accounts. The configured venture attributes define the working interest and billable and non-billable costs.
Actual Processes	Based on the integration with SAP Finance, the document split of the original finance document (cost assignment line) by venture and equity group ensures the correct capturing of all venture-related costs on venture and equity group level. As operator you execute cash call processes to request a down payment from your partners for future expenses in the operational month. The non-operator invoice posting and mapping fiunctionality supports the correct assignment and posting of billable expenditures in the non-operator's financial books.
Month-End Processes	As operator you calculate JVA overheads on top of the month-end allocation results. You use the equity change and equity group adjustment process to assign the correct and valid partner working interest for the current period when the equity group was changed. You use the cutback process to allocate the billable venture expenses according to the current equity group and working interest to the non-operating partner. The joint venture funding reimbursement process ensures the correct capturing and clearing of inter-venture liablities.
Partner Billing and Reporting	As operator you produce accurate billing documents for specific periods, ventures, equity groups, and partners. The document consists of invoice, expenditure details, and billing statement hardcopy. The various reports are providing information on master data and transaction data. It includes billable and non-billable expense information on line item or total level by gross and net venture partners.

Integration with Central Finance

Joint Venture Accounting is integrated in Central Finance. Thus it is possible to collect Joint Venture Accounting data in one central S/4HANA system and to use this data for consolidated reporting. In detail this means that you can perform initial load of historic data (documents and master data), replicate the main JVA master data (joint operating agreements, ventures, equity groups, venture partners), integrate the JVA split results in the FI document replication, replicate internal JVA documents posted by several JVA month-end processes, and compare documents and master data between source and Central Finance system via report to validate whether data is replicated correctly.

3.3.2.3 Financial Closing Cockpit for Entity Close

Business Background

The Financial Closing cockpit supports you in planning, executing, monitoring, and analyzing financial closing tasks for the entities of your group. You can perform local close for the companies of your group on a monthly, quarterly, or yearly basis (or at other intervals) with a freely definable range of closing operations. Local accounting principles and/or principles applied by the group can be taken into account.

More generally you can use the Financial Closing cockpit in the following cases:

- Activities recur periodically.
- Multiple responsible agents are involved.
- Activities are performed within a process that has a fixed chronological sequence or is determined by dependencies.
- The status of all periodic activities needs to be documented and made transparent and available for everyone involved.

Key Features

The Financial Closing cockpit comprises the following features to facilitate the optimization of your entire closing process:

- Event-driven organization of closing activities
- Process overview and monitoring options
- Analysis tools

Closing operations include the following tasks:

- Maintain exchange rates
- Execute recurring entries
- Clear open items

- Perform inventory and post inventory differences
- Reclassify clearing account for goods receipt/invoice receipt
- Value inventory
- Perform closing operations in the subsidiary ledgers
- Perform foreign currency valuation
- Reclassify receivables and payables
- Use functions for tax on sales/purchases
- Perform reconciliation between affiliated companies; these intercompany reconciliations are used in preparation for consolidation.
- Close accounting period and open new period
- Display financial statements
- Carry forward balances
- Evaluate financial statements

3.3.2.4 Corporate Close

3.3.2.4.1 Group Reporting

Business Background

The group reporting solution provides functions for group accounting and management reporting by supporting process control, data collection, data quality control, consolidation, and reporting. It is tightly integrated with SAP S/4HANA Finance and can directly access legal and management accounting from the universal journal. The granularity of data in group reports can be increased so that operational accounting data is exposed to the corporate group level. Drilling down from reports to the operational accounting journal is also supported.

Key Features

The following table explains the key features available:

Key Feature	Use
Master data	Consolidation objects come with master data maintenance apps or Customizing activities. The main objects are the consolidation chart of accounts and the consolidation units and groups that represent organizational entities. Consolidation units are the smallest consolidation relevant organizational units and are grouped into consolidation groups.
Data collection	You can collect financial statement related data from SAP systems as well as non-SAP systems. Various procedures are available for doing this, for example, with direct integration to the accounting module that resides on the same system tenant.
Data preparation	You can check the consistency of reported financial data by using validation rules. You can check the quality of your intercompany data by using intercompany matching and reconciliation. The reported financial data can be translated into the group currency.
Consolidation	Consolidation rules can be applied for interunit eliminations and consolidation of investments and executed on the reported data. Validations can be used to check the consistency of the consolidated financial data.
Reporting	SAP Fiori analytics can be used for basic financial reporting and data analysis. Reporting rules can be applied at report run-time.

3.3.2.4.2 Business Consolidation

Background

Business Consolidation enables you to periodically schedule, generate, and monitor your consolidated financial statements. This is possible for subgroups or the consolidated group, specifically under legal aspects or for the purpose of consolidated Management Reporting. This process offers a high degree of flexibility with regard to the timing of closings as well as the configuration of different accounting principles. You can automate the necessary consolidation steps to a considerable extent and supplement them with manual closing tasks.

Key Features

The following features are available to you as a corporate accountant:

Key Feature	Use

Master data	• Versioning helps you run different consolidations in parallel using different criteria, for example:
	  ○ For actual, plan and target data
	  ○ For parallel financial accounting (for example, U.S. GAAP, IFRS)
	  ○ For simulations
	• The smallest element of the corporate structure in consolidation is the consolidation unit. A consolidation unit can represent a company, a profit center, a business area, or a plant.
	• You use consolidation groups to combine a desired number of consolidation units for purposes of consolidation and reporting.
	• You use financial statement items to enter, post and evaluate monetary values.

Data collection	You can collect individual financial statement data from SAP systems as well as non-SAP systems. Various procedures are available for doing this.
Consolidation tasks	Consolidation tasks enable you to translate the financial data that is collected from each local currency into the group currency. You can also eliminate the financial statement imbalances that result from group-internal relationships. For example, the following consolidation tasks can be automated: • Currency translation • Interunit elimination (including elimination of IU payables and receivables, elimination of IU revenue and expense, and elimination of investment income) • Elimination of interunit profit and loss in transferred inventory • Consolidation of investments • Reclassification
Execution and monitoring of the consolidation process	You use the consolidation monitor to run the consolidation tasks and to monitor the entire consolidation process.
Reporting	Once the consolidation tasks have been completed, you can analyze the data in reports.

3.3.2.5 Document and Reporting Compliance

Business Background

You use document and reporting compliance features to create, process, and monitor electronic documents and statutory reports. The document and reporting compliance features are listed below.

Please note that not all features are provided for each and every country/region. For more information about the available features for a country/region, please check the country/region-specific documentation on the SAP Help Portal.

Key Features

The following table explains the available key features:

Key Feature	Use
Extensive process orchestration, automation, and error handling	For outgoing documents, such as customer invoices, the system processes steps required by each business scenario and applies corresponding statuses to the electronic documents in an automated way. You can display notifications and errors that occur throughout the entire end-to-end process.
Additional reporting activities	Additionally to report generation, you can execute additional manual reporting activities that are relevant for your reporting process. You can make changes to document data after the document has been generated. You can move one or more tax items between the reporting periods by changing the tax reporting date. You can validate your legal reports within the organization before submitting them to the tax authorities using workflow for approval. You can perform data compliance checks in the overall reporting process. If you use SAP Tax Compliance for SAP S/4HANA, the integration with document and reporting compliance features is available to facilitate data compliance check in the overall statutory reporting process.
Monitoring of document/report history and audit trail	You can monitor all process steps that a document/report has been through and view the statuses throughout the entire end-to-end process of an electronic document or statutory report. A full audit trail is provided.

Key Feature	Use
Analytics	You can perform embedded analytics for statutory reports using data analysis. You can track the items considered for reporting under a specific report's version for the supported statutory reports. This tracking helps you to analyze and audit these documents. You can transfer data to an analytics system for detailed business data analysis to get an overview of the entire reporting status across all countries/regions.
Easy-to-use preview	You can visualize and interpret output formats in a user-friendly and consistent way. Report fields are labeled and translated into the logon language.
Link to source document	From each electronic document or statutory report, you can trace back to the source document(s) it refers to in the original applications.
Incoming documents	You can process incoming electronic documents (for example, receive, validate, acknowledge, accept and/or reject them) for Australia, Austria, Belgium, Brazil, Chile, China, Colombia, Denmark, Germany, Italy, Ireland, the Netherlands, New Zealand, Norway, Poland, Singapore, Sweden, and Turkey.
E-mail integration	In the following countries/regions, you can configure the system to send electronic documents to your business partners via e-mail: Brazil, Chile, Germany, Italy, Mexico, Peru, and Turkey. Independent of the country/region, for the reported period of a statutory report, you can send the correspondence via e-mail to the business partner with whom the transactions are done.
Process of electronic documents under contingency	When there are issues with the communication of electronic documents or statutory reports to external systems, you can switch to a contingency process to proceed with your business transactions without disruption. This feature is available for Brazil, Chile, Colombia, and Peru.
Extensibility	You can use a reference report, an electronic document, and a process definition to extend an existing report, electronic document, or process or copy it. You can create your own statutory reports, electronic documents, or process definitions. You can reuse existing report categories by creating report categories with reference. In some scenarios (such as for Brazil), integration with external sources or APIs for partner integration is available.

Key Feature	Use
Automated Regression Tester	You can perform automated regression tests of any enhancements, error corrections, optimization, or deletion of existing features made in statutory reports by comparing the changes against a reference report run. You can perform regression tests for custom built statutory reports. You can personalize the regression test result dashboard for a consolidated overview of test results. You can configure the frequency of e-mail notifications that contain the regression test results.

3.3.3 Treasury Management

3.3.3.1 Payments and Bank Communications

Business Background

Payments and Bank Communications streamlines, controls, and gives better transparency into business' communications with your banks. Automated payment workflows streamline routing and approval processes. Treasury managers can ensure compliance by using rules-based approval workflows that guarantee proper payment approvals and documentation. With central in-house control over cash, financial managers can decrease dependency on banks and the need to transfer cash to regions.

Key Features

Key Feature	Use
Bank Communication Management	
Managing Multiple Bank Communication Interfaces	Bank Communication Management supports communication with multiple banks via SWIFT net, service bureaus or other channels.
Receive Payment Status Messages	Payment status messages can be received and displayed in the payment status monitor. You can use this function to display status messages containing status codes and status reason texts for particular batches or payments.

Key Feature	Use
Merge Payments from Different Payment Runs	Group together payments from several payment runs into one payment run and transfer them together on payment media.
Approve Payments	You can use this function to display a work list of payment batches for processing. You can then choose to approve or reject batches from the worklist. After full approval, the payment medium for the batch will be created and sent to your bank.
Batch and Payment Monitor	With this function you can access an overview of batches (groups of payments) and see their current status. You can drill down to the payments in each batch and access information on their release (approval) process and status history.
Monitoring your Bank Statements	You can display the status of bank statements from individual house bank accounts. A bank statement that is delayed or that does not reach the monitor can be identified with this function just as quickly as any differences occurring between the bank statement balance and the internal G/L account balance. Any items that are not assigned as well as differences in posting are also recognized in this way.
Define Alerts	Define timeouts and trigger alerts, for example when not receiving an acknowledgement for a particular batch within a defined time interval.

Key Feature	Use
In-House Cash	
In-House Cash acts as an internal bank within the corporate group, with which each affiliate has one or more current accounts (e.g. in different currencies). Key functionality is the processing of internal payments between affiliates as well as external payments between affiliates and external business partners. In addition, incoming payments can be routed to the relevant affiliates. With help of In-House Cash the amount of external bank accounts required can be reduced as well as the number of cross border payments.	

Key Feature	Use
Manage Master Data	The In-House Cash account is the central object and is created for each participating affiliate. The affiliate has the role of the account holder. Within the account master data following information are stored: • Account balance as well as the turnovers • Account holder and account currency • Conditions can be defined to calculate interest and charges to be debited or credited when accounts are settled. They also determine the value dates for payment transactions and account balancing. • Limits can be defined to restrict the amount-based disposal on account level.
Payment Processes	In-House cash supports the following payment processes: • Internal payments: process of clearing payables and receivables between group affiliates (credit transfer as well as direct debit is supported) • Central payments: payments from affiliates to external business partners (credit transfer as well as direct debit is supported) • Local payments: cross-border payments initiated by affiliates are transferred into a domestic payment by sending an external payment via the FI system of a local affiliate (to save costs) • External incoming payments: e.g. incoming payments that result from zero balancing offered by the external banks • Central payments with several In-House Cash centers: Cross-bank area postings enable payments between two In-House Cash Centers via all existing In-House Cash Centers.
Route Processing for External Payments	The aim of route processing is to determine a clearing partner to make the payment. You can use this process for all types of external payments: • Local payments • Central payments

Key Feature	Use
Account Balancing	The account balancing function is used to settle the accounts. Account balancing is triggered periodically (e.g. daily, weekly, monthly) in accordance with the entry in the account master data. Interest and charges for the accounts due to be balanced are calculated and posted on the basis of the defined conditions.
Bank Statements	Bank statements for the accounts managed in the In-House Cash are automatically created on a regular basis, sent and posted in the FI system of the affiliates.
General Ledger Integration	In-House Cash is set up as a subledger. Therefore all items posted on the current accounts have to be transferred during an automated end-of-day procedure to the corresponding general ledger accounts as totals.
Cash Concentration	Cash Concentration means the automated generation of payment orders that debit or credit accounts within an account hierarchy on a regular basis, e.g. daily, weekly, monthly. For example a certain minimum balance can be defined or the remaining balance on an account is always to be transferred to another account.

Key Feature	Use
Advanced Payment Management Advanced payment management allows you to centralize all payment activities of a corporate group. This allows the group to decide centrally how a payment is to be executed. The solution supports four payment scenarios: • Internal payments • Payment 'in name of' with forwarding only • Payments 'in name of' with routing optimization • Payments 'on behalf of' The solution integrates with other areas within S/4HANA like In-House Cash, Cash Management, Bank Communication Management, Bank Account Management, and General Ledger.	
Inbound Format Conversion	Incoming payment formats can be mapped to a canonical model which is used internally to represent a payment in the solution. The solution has some pre-delivered formats, but also allows you to add custom formats. The result of such an inbound conversion is a payment order with one or multiple transactions.

Key Feature	Use
Payment Enrichment & Validation	A payment order can be enriched and validated on four levels: • Payment order • Ordering transaction • Recipient transaction • Cross validations
Payment Routing	Within routing the following four payment scenarios can be identified. The respective agreements are determined based on flexible rules. • Internal payments Payment between group affiliates without the use of an external bank transfer; • Payments 'in name of' with forwarding only The sending group affiliate has already defined which bank account should be used. In this case the payment updates cash management only and can optionally trigger an approval workflow before the payment is forwarded to the bank communication channel. • Payments 'in name of' with routing optimization The sending group affiliate has not predefined the bank account to be used. In this case, the solution determines which affiliate bank account and which payment instrument should be used, and then posts to the corresponding bank clearing account. • Payments 'on behalf of' The sending group affiliate is paying using an account of the group. Therefore, the solution is determining which bank account of the group and which payment instrument should be used and is creating the corresponding postings.
Payment Clearing towards In-House Cash	In-House Cash acts as a subledger which is used by advanced payment management to apply postings of internal transactions out of internal payments scenarios, or payment 'on behalf of' scenarios.
Payment Clearing towards General Ledger	Every time the solution determines how an external payment is to be executed, a posting towards General Ledger is performed into the Bank Clearing Account.

Key Feature	Use
Clearing of External Payments	External payments can be processed in three ways: • Direct Clearing A payment is sent out immediately as an individual transaction without the need of a batch job (for example, for urgent payments). • Queued Clearing An individual payment can be queued until it needs to be sent to the bank. Once the time is reached the payment is handled similarly to a direct clearing scenario. • Batched Clearing A payment is batched together with other payments and is sent out at a defined point in time as a payment batch (for example, for supplier payments).
Cash Management Integration	Each payment processed through the solution updates Cash Management to allow a central view on the cash position and its forecast.
Bank Communication Management Integration	Once the final outgoing payment order is generated, an approval can be triggered leveraging Bank Communication Management. After the final approval, the payment format is generated. In addition, the status of the payment batch can be monitored within the payment monitor.
Outbound Format Conversion	The last step of payment processing is to trigger the generation of the bank payment format. For outbound a mapping from the canonical model towards the bank format is performed. The solution has several pre-delivered formats, but also allows you to add custom formats. Once a format is generated, either a file is generated, or an API based communication towards SAP Multi-Bank Connectivity is triggered directly.
Payment Exception Handling	If a payment runs into an error situation (for example, caused by formal issues with the payment, or by a negative status report from a bank) an exception handling process is triggered. Errors can be handled by using various reactions, such as the following: • Rejecting the entire payment order • Returning transactions to the original sender • Manual repair • Automatic repair based on correction rules • Resubmission • Ignoring errors which are not severe

Key Feature	Use
SAP Watch List Screening Integration	Each payment processed through the solution can be checked against sanctioned party lists using the integration with SAP Watch List Screening.

3.3.3.2 Cash and Liquidity Management

3.3.3.2.1 Cash Daily Operations

Business Background

Every day, cash managers need to perform tasks such as monitoring cash positions, making bank transfers, approving payments, and so on, to ensure the corporate functions and the business runs with enough fund.

Key Features

Key Feature	Use
Bank statements	You can use this feature to import and mannually create bank statements.
Bank statement import status	You can use this feature to monitor the import status of end-of-day and intraday bank statements for all the bank accounts that are set to be monitored.
Cash positions	You can use this feature to check the actual and forecasted cash positions with flexible selections of analytical dimensions such as bank, country/region, company code, and so on.
Cash flow items	You can use this feature to track document line items that have impact on your company cash flows, for example, invoices, payments, bank statements, financial transactions, memo records, and so on.
Bank transfers	You can use this feature to make bank transfers between your bank accounts and track the status of the bank transfers that you made recently. You can also define and use templates to speed up your routine work for regular bank transfers.

Key Feature	Use
Cash pooling	You can use this feature to create or remove cash pools, which can later be used in cash concentration between the assigned bank accounts.
Payment approvals	You can use this feature to approve or reject outgoing payments before the payment files are sent to banks.
Memo records	You can use this feature to create memo records manually and edit memo records in a list.
Cash trade request	You can use this feature to create cash requests for foreign exchange deals, based on which the creation process of trade requests will be automatically triggered.
Cash flow reconciliation	You can use this feature to manually reconcile intraday memo records with forecasted cash flows to gain a more accurate forecast of your bank account balances.

3.3.3.2.2 Bank Relationship Management

Business Background

To centrally manage the corporate or business bank accounts in a company, cash managers need to carry out activities such as monitoring, creating, modifying, closing, and reopening bank accounts, as well as performing annual reviews.

> **i** Note
>
> This solution is intended for corporate and business bank accounts only. You should not use it for personal bank accounts.

Key Features

Key Feature	Use
Banks and house banks	You can use this feature to display, create, and change data about the banks and house banks that your company, your customers, and your suppliers use to transact business.

Key Feature	Use
Bank account master data	You can use this feature to define master data for your company's corporate or business bank accounts, such as: • Common properties of bank accounts • Payment approvers • Overdraft limits
Workflow processes	You can use this feature to control the process of opening, modifying, closing, reviewing, and mass changing payment approvers of bank accounts
Dual control	You can use this feature to implement a dual control process for bank account management. With this process, revisions are saved whenever users create, modify, copy, reopen, or close a bank account. The revisions have to be activated by another authorized user before they become effective.
Bank account reviews	You can use this feature to perform the following tasks: • Initiate a review process for selected bank accounts to ensure that the bank account master data is up to date • Review bank accounts that are assigned to you • Check all the review requests that are in process or completed
Sent and received requests	You can use this feature to track and process requests that you have sent or received for opening, modifying, closing, reviewing, and mass changing payment approvers of bank accounts.
Foreign bank accounts	You can use this feature to check the foreign bank accounts and responsible payment approvers in your company. The information can be used for legitimate reports or analytical purposes.
Bank fees	You can use this feature to perform the following tasks: • Import bank services billing files to your system • Monitor imported bank fee data • Define bank fee conditions and use the conditions to validate imported bank fee data
Bank correspondence	You can use this feature to generate correspondence letters to banks for bank accounts that are set to closed or have payment approver changes in the system.
Bank relationship overview	You can use this feature to view the key information about bank relationship management in one place, such as recent payments, bank profiles, bank fees, and so on.

Key Feature	Use
Bank account balances	You can use this feature to view bank account balances updated by imported end-of-day bank statements. You can also manually update or import bank account balances. In addition, you can monitor whether bank account balances have been updated in time for your bank accounts.

3.3.3.2.3 Liquidity Management

Liquidity Management

Cash managers need to make estimates of future cash flows so that they can see clearly what payment obligations are to be fulfilled and whether there is the need to make investment or funding plans.

Key Features

Key Feature	Use
Liquidity planing	You can use this feature to develop and analyze liquidity plans. You can track the status and trace liquidity planning cycle to get an early warning indicator of liquidity shortages or a steering tool for medium- and long- term investment or borrowing.
Cash flow analysis and forecast	You can use this feature to do the following: • Check the daily cash inflows and outflows • Analyze actual cash flows, the actual amounts of money that have been paid from or received on your bank accounts, with various dimensions • Forecast the future liquidity trend with flexible selections of analytical dimensions, such as bank, country/region, company code, and so on.
Snapshot	You can use this feature to enable automatic captures of cash positions, actual cash flows, and forecasted cash flows. You can view historical figures as they were at the time of any snapshot date and make comparison between different forecasts as well as between actual cash flows and forecasts.

3.3.3.3 Debt and Investment Management

Business Background

You can portray the process for managing your liabilities and capital investments. The following functional areas are covered: Front Office, Middle Office, Back Office, and Accounting. In addition, integrated posting and payment processes and integrated position reporting allow you to achieve compliance with legal requirements and regulatory standards.

The integrated and automated processes (straight-through processing) provide further support by enabling you to focus on value-added activities.

Key Functions

Function	Use
Manage Financial Transactions	In Transaction Management, you can enter financial transactions for the following areas: • Securities (stocks, investment certificates, subscription rights, bonds, bonds with repayment schedule, warrant bonds, convertible bonds, warrants, shareholdings) • Money market (fixed-term deposits, deposits at notice, commercial papers, cash flow transactions, interest rate instruments, current account-style instruments, fiduciary deposits) • Facilities • Derivatives (caps/floors, swaps, forward rate agreements, total return swaps, OTC options) • Listed derivatives (futures, repos, listed options) • Forward securities transactions • Securities lendings • Forwards • Forward loans • Trade Finance (Letters of credit, bank guarantees) The type of financial transaction dictates which functions are available for processing the financial transaction across its lifecycle.
Portray Intragroup Transactions	Functions are also delivered that allow you to portray intragroup transactions.

Function	Use
Perform Central Clearing	The functions for the clearing accounts allow you to portray clearing of your clearing-relevant financial transactions (foreign exchange transactions and swaps) by your central counterparty (CCP).
Manage Financial Positions	• Balance sheet transfers • Securities account management and futures account management provide a range of functions, such as a function for performing **securities account transfers**, functions for taking **corporate actions**, and functions for **exercising security rights**.
Pay Flows	You can use the payment program for payment requests to pay flows that are relevant for payment.
Post Business Transactions in Financial Accounting	Using the integration with Financial Accounting, your posting-relevant flows can be posted in Financial Accounting.
Manage Financial Positions in Parallel in Accordance with Different Accounting Principles	You use valuation areas to portray parallel accounting. You therefore need to define a valuation area for each set of accounting principles. You post the valuation results separately for each valuation area.
Calculate NPVs	You can calculate the NPVs of your financial transactions and financial positions for a specific key date, including credit and debit value adjustments if necessary.
Execute Key Date Valuation	In Accounting, you can use the functions for valuating your financial positions for a specific key date.
Execute Accrual/Deferral	You use accruals/deferrals to determine for each valuation area the expenses and revenues from financial transactions or positions for a given period and to assign them to the correct accounting period, irrespective of when they were actually due.
Execute Valuation Class Transfer	You can use the valuation class transfer function for individual or multiple positions from the "Securities" and "OTC Transactions" areas. You can transfer securities positions either fully or partially to other valuation classes. You can reverse the valuation class transfer.

Function	Use
Execute Account Assignment Reference Transfer	You use the account assignment reference to control which G/L account in Financial Accounting is used to manage the respective position. You assign an account assignment reference to each position. With the account assignment reference transfer, you can post positions with their book value from one account assignment reference to another. This is similar to how financial positions can be transferred between G/L accounts.
Analyze Financial Transactions and Financial Positions	You can use a range of reports to analyze your financial transactions and positions specific to a key date or period. These reports are based on logical databases. Further, you can define your own reports on the basis of these databases.
Perform Clearing Threshold Reporting	Non-financial counterparties (NFCs) of derivative financial instruments are not generally required to use a central clearing partner to process these financial transactions. NFCs are required to perform clearing only in cases when they have not concluded these financial transactions for risk mitigation and when the rolling average position of these transactions exceeds the specified clearing threshold values continuously for a period of 30 days. Clearing Threshold Reporting (CTR) supports NFCs in monitoring their derivative financial transactions that were not concluded for risk mitigation.
Perform Trade Repository Reporting	The trade repository reporting functions support you in creating trade repository messages. Once the process is complete, your trade repository messages are available as a file on the application server for transfer to the trade repository. From the application server, you can also import and interpret incoming messages for the trade repository and store them in Document Management.
Determine Market Risks of Financial Transactions	You can measure the market risk of your financial transactions. You do this using mark-to-market methods, such as key figure analysis and NPV analysis. Furthermore, you can calculate your *Value at Risk* or your *Cash Flow at Risk*.
Limit Counterparty Risks	You can measure, analyze, and control or limit your counterparty risk.
Calculate and Monitor Rates of Return	You can calculate and monitor the rates of return on your financial assets.

Function	Use
Save and Analyze Position Components in the Result Database and Use Position Components as the Basis for Calculating Additional Position Key Figures	You can read the position component values of the positions and subpositions from the position management and store them as key figures in the Result Database. This enables you, for example, to store the position component values on a daily or weekly basis based on the original market data in the Result Database. You also can calculate your own position key figures (based on the original position components) that are not available in Position Management of the Transaction Manager. From the Result Database, you can generate reports in the *Analyzer Information System* (AIS), which displays these key figures.
Manage Market Data	In Market Data Management, you store the market data that you require for valuating and processing your financial transactions (such as security prices, reference interest rates, volatilities, and correlations). For this, you can use datafeed or the market data file interface. Using datafeed, you can automate the import of the required market data from your market data provider.
Transfer Legacy Data	If you want to implement the Transaction Manger and your data (legacy data) are in a source system, you need to ensure that these data are available in the Transaction Manager for a key date. Legacy data is transferred to the system using a process comprising a number of steps. However, for some of these steps, you have alternative ways of transferring data.
Transfer Data Using Standardized Interfaces	The standardized interfaces known as Business Application Programming Interfaces (BAPIs) turn SAP applications into open systems that let you exchange data across system boundaries.
Process Payments Using In-House Cash	The system provides a BAdI with which you can connect payment programs, such as *In-House Cash*.

3.3.3.4 Financial Risk Management

Business Background

You can deploy robust analytical functions that perform thorough checks for foreign exchange risks and counterparty risks.

You can model a range of scenarios to gain insights into the extent of risks at the time of the analysis. Further, you can apply effective hedge strategies in accordance with international accounting standards.

The system provides all-round support throughout the hedging process, from identifying risks and quantifying and analyzing them through to hedging risks with optimum hedging instruments. For hedging instruments, the complete process is covered, from front office, middle office, and back office through to accounting.

Key Functions

Function	Use
Determine FX Risk Positions	In *Exposure Management 2.0*, you collect future incoming and outgoing payments of your company that are associated with an FX risk. These payment flows are either actual payments that already have a fixed amount and time settings or they are only planned payments. *Exposure Management 2.0* helps you identify the risks in payment flows and provides integration with *Hedge Accounting for Exposures (E-HA)*. The exposure positions are also integrated with the *Hedge Management of Net Open Exposures* process.
Review Balance Sheet FX Risks	You can calculate and review balance sheet FX exposures and the related hedging transactions as well as the resulting net exposure.
Hedge Management for Net Open Exposures	This feature is part of the *Hedge Management and Accounting of Net Open Exposures* process. You gain an overview of the FX risk that your company is exposed to as well as of the financial transactions that you used to mitigate that risk. It reports FX exposures and financial transactions (hedges) managed in Treasury and Risk Management. The net open exposures, that represent the unhedged portion of the FX exposures, and additional key figures are calculated, supporting you in making your hedging decisions.
Manage Hedging Instruments	In the transaction management, you can enter your hedging instruments: • Foreign exchange transactions (spot transactions, forward exchange transactions, FX swaps) • Derivatives (FX options, collar FX options) The type of financial transaction dictates which functions are available for processing the financial transaction across its lifecycle.

Function	Use
Manage Incoming and Outgoing Transaction Correspondence for Hedging Instruments	You can use the Correspondence Framework to automate processing of your transaction correspondence.
Portray Intragroup Transactions	Functions are also delivered that allow you to portray intragroup transactions.
Perform Central Clearing	The functions for the clearing accounts allow you to portray clearing of your clearing-relevant financial transactions (foreign exchange transactions and swaps) by your central counterparty (CCP).
Manage Financial Positions	• Balance sheet transfers • Securities account management and futures account management provide a range of functions, such as a function for performing **securities account transfers**, functions for taking **corporate actions**, and functions for **exercising security rights**.
Pay Flows	You can use the payment program for payment requests to pay flows that are relevant for payment.
Post Business Transactions in Financial Accounting	Using the integration with Financial Accounting, your posting-relevant flows can be posted in Financial Accounting.
Manage Financial Positions in Parallel in Accordance with Different Accounting Principles	You use different valuation areas to portray parallel accounting. You need to define a valuation area for each set of accounting principles. You determine the valuation results and then post them separately for each valuation area.
Hedge Accounting for Exposure Items (FX Risk)	As part of the *Hedge Management and Accounting of Net Open Exposures* process this feature enables you to perform hedge accounting for cash flow hedges to support IFRS 9 requirements for the foreign exchange exposures that your company is exposed to including an automated designation process, which automatically designates hedging instruments into a hedging relationship when the financial transaction is saved, classification and reclassification process of designated hedging relationships as well as the dedesignation process.

Function	Use
Hedge Accounting for Exposures (FX Risk)	• You can manage hedging relationships which document the use of financial instruments to hedge your risk positions (exposures) against FX risks. • You can portray *fair value hedges* (FVH) and *cash flow hedges* (CFH) including *net investment hedges (NIH) for foreign subsidiaries*. • You can run effectiveness checks for your hedging relationships and to document your hedging relationships. It also offers valuation and accounting functions for hedge accounting purposes.
Execute Key Date Valuation	In Accounting, you can use the functions for valuating your financial positions for a specific key date.
Execute Accrual/Deferral	You use accruals/deferrals to determine for each valuation area the expenses and revenues from financial transactions or positions in the Transaction Manager for a given period and to assign them to the correct accounting period, irrespective of when they were actually due.
Execute Valuation Class Transfer	You can use the valuation class transfer function for individual or multiple positions from the "Securities" and "OTC Transactions" areas. You can transfer securities positions either fully or partially to other valuation classes. You can reverse the valuation class transfer.
Execute Account Assignment Reference Transfer	You use the account assignment reference to control which G/L account in Financial Accounting is used to manage the respective position. You assign an account assignment reference to each position. With the account assignment reference transfer, you can post positions with their book value from one account assignment reference to another. This is similar to how financial positions can be transferred between G/L accounts.
Analyze Financial Transactions and Financial Positions	You can use a range of reports to analyze your financial transactions and positions specific to a key date or period. These reports are based on logical databases. Further, you can define your own reports on the basis of these databases.

Function	Use
Perform Clearing Threshold Reporting	Non-financial counterparties (NFCs) of derivative financial instruments are not generally required to use a central clearing partner to process these financial transactions. NFCs are required to perform clearing only in cases when they have not concluded these financial transactions for risk mitigation and when the rolling average position of these transactions exceeds the specified clearing threshold values continuously for a period of 30 days. Clearing Threshold Reporting (CTR) supports NFCs in monitoring their derivative financial transactions that were not concluded for risk mitigation.
Perform Trade Repository Reporting	The trade repository reporting functions support you in creating trade repository messages. Once the process is complete, your trade repository messages are available as a file on the application server for transfer to the trade repository. From the application server, you can also import and interpret incoming messages for the trade repository and store them in Document Management.
Determine Market Risks of Financial Transactions	You can measure the market risk of your financial transactions. You do this using mark-to-market methods, such as key figure analysis and NPV analysis. Furthermore, you can calculate your *Value at Risk* or your *Cash Flow at Risk*.
Limit Counterparty Risks	You can measure, analyze, and control or limit your counterparty risk.
Save and Analyze Position Components in the Result Database and Use Position Components as the Basis for Calculating Additional Position Key Figures	You can read the position component values of the positions and subpositions from the position management and store them as key figures in the Result Database. This enables you, for example, to store the position component values on a daily or weekly basis based on the original market data in the Result Database. You also can calculate your own position key figures (based on the original position components) that are not available in Position Management. From the Result Database, you can generate reports in the *Analyzer Information System* (AIS), which displays these key figures.
Manage Market Data	In Market Data Management, you store the market data that you require for valuating and processing your financial transactions (such as security prices, reference interest rates, volatilities, and correlations). For this, you can use datafeed or the market data file interface. Using datafeed, you can automate the import of the required market data from your market data provider.

Function	Use
Transfer Legacy Data	If you want implement the *Transaction Manager* and your data (legacy data) is in a source system, you need to ensure that this data is available in the Transaction Manager for a key date. Legacy data is transferred to the system using a process comprising a number of steps. However, for some of these steps, you have alternative ways of transferring data.
Process Payments Using In-House Cash	System provides a BAdI with which you can connect payment programs, such as *In-House Cash*.
Transfer Data Using Standardized Interfaces	The standardized interfaces known as Business Application Programming Interfaces (BAPIs) turn SAP applications into open systems that let you exchange data across system boundaries.

3.3.3.5 Integration Scenarios

3.3.3.5.1 Integration with External Trading Platforms

Business Background

SAP S/4HANA supports the integration with external trading platforms (currently the **trading platform integration** application). SAP S/4HANA provides an interface that allows foreign exchange transactions traded on an external trading platform to be transferred to SAP S/4HANA. This enables seamless FX risk management processes as the key figures in SAP S/4HANA are automatically updated to reflect the traded amount.

3.3.3.5.2 Treasury Workstation Integration to Accounting

Business Background

With the Treasury Workstation integration to Accounting, you can run your Treasury and Risk Management component in an SAP S/4HANA Cloud system from which you transfer accounting documents to an existing enterprise resource planning environment (currently SAP S/4HANA). Treasury and Risk Management manages the financial transactions and generates the corresponding postings in SAP S/4HANA Cloud. These postings can be transferred to the Financial Accounting component in the enterprise resource planning (ERP) system.

Key Features

The following table explains the key features available:

Key Feature	Use
Document Replication	You can transfer accounting documents from SAP S/4HANA Cloud to an ERP system.

3.3.3.5.3 Treasury Workstation Cash Integration

With the Treasury Workstation Cash Integration, you can deploy your SAP S/4HANA system as a Treasury Workstation and integrate with other business systems. The following table explains the key features:

Key Feature	Use
Replicating house banks, house bank accounts, and bank accounts	You can replicate house banks, house bank accounts, and bank accounts in the following scenarios: • Between some certain versions of SAP S/4HANA systems • Between your SAP S/4HANA system and some certain versions of SAP S/4HANA Cloud systems • From your SAP S/4HANA system to some certain versions of ECC (ERP Central Component) systems
Receiving and releasing cash flows from other business systems	You can use a service to write, update, and delete cash flow data from integrated SAP S/4HANA systems and third-party systems. You can also use a review and release process to ensure the correctness of the data.

3.3.3.6 Country/Region-Specific Features in Treasury Management

Key Features

The following table explains the key features available for the countries/regions:

Country/Region	Key Feature	Use
Brazil	Tax Calculation	You can process the following functions: • Calculate the financial operation tax (IOF) and the withholding tax (IRRF) and their accruals for your money market instruments. • Calculate the withholding tax (IRRF) and the financial operation tax (IOF) amounts for your intercompany loan transactions. • Calculate net amounts and the withholding tax (IRRF) and its accruals for your swap transactions on periodic closings and when the yield of the operation is received (early or final payments). • Calculate the withholding tax (IRRF), the financial operation tax (IOF), and the IRRF adjustment after you sell funds. • Create transactions for paying withholding tax (IRRF), financial operation tax (IOF), and IRRF adjustment for funds.
France	Amortized Cost	You can use a linear amortized cost (LAC) method or a scientific amortized cost (SAC) method for debt securities, depending on the difference between the purchase price and the nominal price, as required by French GAAP.
	Capitalization Reserves	You can identify financial transactions that have been incorrectly posted to the capitalization reserve account.
	FIFO Revaluation	You can consolidate positions in the nonregulated portfolios into one tax portfolio and reevaluate using the FIFO method.
	Impairment	You can perform impairment in three steps: • Identify which positions need to be impaired, using different selection criteria for securities and bonds. • Check if the security or bond is a long-term or short-term investment. • Calculate the impairment for long-term investments using an expert value or an expected value. For short-term investments, the impairment value is the difference between the acquisition cost and the market value.
Hungary	Off-Balance Posting	You can post specific types of transactions off-balance for a given period (depending on the transaction).
	Repo Operations	You can display all data relevant for repurchase agreements (repos) that is required for reporting purposes in Hungary. You can also process repos with or without collateral depending on your selection for product type and transaction type. In addition, you can show incoming payment flows and any tax flows for a security account.

Country/Region	Key Feature	Use
	Security Interface	You can harmonize data on the business partner's securities accounts with data on the business partner's securities accounts at KELER (Central Clearing House of Hungary).
India	Tax Deducted at Source (TDS)	You can report Tax Deducted at Source (TDS).
Israel	Annexing	Enables annexing calculation of Fixed Term Deposit, Deposit at Notice, Cash Flow Transaction, Interest Rate Instrument. The calculated annexing differences are added to the transaction's cash flow as derived flows.
Japan	Impairment of Foreign Securities	You can process impairment for foreign securities (stock and bonds) according to the requirements of Japanese GAAP and IAS rules.
	Begin-End Interest Calculation	You can calculate interest for both first and last day of the period in money market instruments.
	Parallel Conditions	You can use this function when your instruments in money market require more than one valid nominal interest condition simultaneously. You can use the parallel conditions for different purposes, for example, to calculate fees, for commissions, or for interest calculation with different base calculation. Most Japanese banks include the start and end date of the deposit (the instruments in money market) to calculate the interest.
South Korea	Securities	You can process the following regarding pricing trading bonds: • Calculate the dirty price • Calculate effective interest rates
Turkey	Tax Calculation	You can calculate the bank loan taxes and foreign currency transaction taxes.
	Begin - End Interest Calculation	You can calculate interest for both first and last day of the period in money market instruments.
United States	Wash Sale	You can transfer the amount of the capital loss after the sale of a security by posting the corresponding loss amount to the book value of the purchase(s) of the same or substantially identical securities.
	Average Exchange Rate	You can calculate average exchange rates and post income statement items based on these rates.
	Facility Assignments	You can activate the Assignment of Facilities function for each relevant product type. This function enables you to assign a revolving line of credit (facility) to a letter of credit (facility).

Country/Region	Key Feature	Use
	Secondary Index and Interest Spread	You can define secondary indexes that you then assign to revolving line of credits and their drawings. You can also use a condition type you created for the interest spread condition of the revolving line of credit.
	To Be Announced (TBA)	You can define settlement types for To Be Announced (TBA) transactions.

3.3.4 Commodity Management

3.3.4.1 Commodity Procurement

Business Background

With *Commodity Procurement* you enter, process and manage your purchasing contracts, purchase orders, goods receipts and invoices for commodities of all industries, perform a simple to use formula-based commodity pricing, also for future dates, use the market data management based on derivative contract specifications, enter and allocate price fixations, and perform period-end valuations.

Key Features

The following table explains the available key features:

Key Feature	Use
Market Data Management	You can apply price data for commodity derivatives based on derivative contract specifications (DCS) published at trading platforms. The DCS is used for commodity futures, listed options, and commodity forwards. It reflects rules and conditions agreed upon at an exchange, and that form the contract basis for trading with a specific commodity or for a specific derivative contract. You can use the DCS for the automatic determination of maturity key dates and DCS periods. The DCS is applied within the Commodity Pricine Engine for purchasing documents. Except for commodity forwards, based on DCS and market identification code (MIC), price data can also be entered manually can also be entered manuallyfor defined price types and key dates, which determine specific contracts. You can also upload market data. You can apply basis market data for the price difference between the local cash price and the commodity futures price. The basis reflects characteristics such as freight, storage costs, quality factors, targeted margin, and the local supply and demand situation. Basis market data can be entered manually and can be accessed by the Commodity Pricing Engine (CPE).

Key Feature	Use
Commodity Pricing	You can apply complex pricing formulas, rules and conditions in a simple way. The commodity pricing engine uses DCS-based market data and basis prices, and is enabled for commodities of all industries. Commodity pricing is applied in purchase orders, goods receipts, provisional and final invoices, the period-end valuation, and comprises the following functions: **Setting Up CPE Formulas, Terms and Rules** You can use CPE formulas, terms and rules that define the pricing of a commodity in a purchasing document. Formulas consist at least of one term, and can contain detailed pricing rules such as fixed values, or absolute or percentage surcharges. You can set up the price determination as Customizing data or, for regular changes, as master data. If CPE data is applied as master data, pricing data can immediately be used for new purchasing documents. CPE formulas and reference date routines can be set up application-independent, means for the purchasing and the sales side together. **Formula Assembly based on BRFplus** You can apply a flexible formula determination and defaulted CPE data in purchasing documents by using the Business Rules Framework plus. For the determination of CPE formulas, terms and rules, you can use template applications with standard access sequences that you can copy and use as it is. **Formula Evaluation** You can use the formula evaluation of the CPE that controls, how formula/term rates and formula/term values are calculated for purchasing documents. For each pricing-relevant process, the formula evaluation is automatically started. During the formula evaluation, the system uses input data such as document data like commodity quantity and quality data, as well as conversion and rounding rules, reference data, price quotations, surcharges, currency exchange rates, and factory calendar data. You can use a specific CPE quotation forecast routine to get price quotations with dates in the future. You can use a dedicated exchange rate forecast routine to calculate swap rates used for the determination of exchange rate forecasts for currency conversions. **Price Fixations and Allocations** To replace the floating price (market price for future date) by an agreed fixed price of complete or partial pricing-relevant commodity quantities in purchasing documents, you can use the price fixation option. you can use the price fixation option to replace the floating price (market price for future date) by an agreed fixed price. Price fixation options can be defined and exercised on term level. Except for document conditions in purchasing contracts, you can exercise price fixation options. For purchase orders the

Key Feature	Use
	priced quantity is automatically or manually allocated to the related goods receipts quantity. You can create and change price fixations for a document before or after subsequent documents have been created. You can change an allocation as long the goods receipt has not been finally invoiced yet. You can manually assign price fixations, to see the allocated or not allocated items for a selected purchase order, or edit an allocation (re-allocation). You can display an allocation worklist to get an overview of the documents relevant for the allocation, and of the allocation statuses. **Manage Price Fixation Options** You can, for complete or partial pricing-relevant commodity quantities of logistics documents, replace the floating prices by agreed fixed prices by means of exercising price fixation options. For different currencies you can fix the currency exchange rate. Existing price fixation exercises can be updated or deleted, too. **Tiered Pricing** You can deside to either use the price fixation function or the tiered pricing. With the tiered pricing you can process contracts that include a negotiated price structure, deviated into quantity tiers or date tiers. Within these contracts you can define, adjust, or extend quantity tiers and date tiers. The call-off documents and the delivery documents consume the price information from the tiers. If required, to consume the tiered prices properly, you can change call-off item quantities, or resort deliveries following a certain sequence. **Configurable Parameters and Formulas (CPF) based on BRFplus** You can define complex pricing rules and CPF formulas without programming effort by creating additional pricing-relevant parameters, formulas, and using them in BRFplus functions. The CPF with BRFplus enables, for example, an automatic bonus and penalty calculation based on delivered qualities and contract conditions. **Configurable User Interface for Pricing** You can configure the user interface of pricing data. It enables you to use and to adapt delivered standard views for pricing data, as well as to create customer-specific views. **Agreed Conversion Factors and Quantity Adjustments** You can specify agreed conversion factors in a business document. You use this function for a condition, if you want to use a conversion factor for a unit-of-measure pair, and the conversion factor deviates from the one in the material master. You can specify one agreed conversion factor per unit-of-measure pair,

Key Feature	Use
	and assign it to a condition, the current item, or to all items. During pricing, the system searches in this order for agreed conversion factors. You can adjust the quantity that a price condition uses in a purchasing document. You use this adjustment function, if the quantity that is relevant for the corresponding condition deviates from the quantity of the purchasing document item. For the selected purchasing document, the system uses a specific condition type to calculate an adjusted quantity by applying an adjustment factor. Such a condition is called a source condition. Subsequent conditions can use the calculated adjusted quantity or the adjustment factor of source conditions. You can enter the adjustment factor within a purchasing document in the respective pricing view of the configurable user interface for pricing. **Interfaces for CPE and CPF Data** You can use the CPE interface to read CPE data from database tables and to add, change and delete CPE data. Analogous to this, with the CPF interface it is possible to read CPF data from database tables and to add, change and delete CPF data. **Commodity Pricing for Global and Trade Management (GTM)** For the pricing of document items of GTM documents you can use CPE and CPF conditions, including quantity adjustment conditions. Adjusted quantities can be consumed by CPE conditions. Within the CPE, GTM Pricing and Payment Events (PPE) can be selected from the reference date routines. **Commodity Pricing for Oil and Gas (SAP IS-Oil)** You can use SAP IS-Oil-specific QCI default values for quantity conversions in the CPE, applied in contracts and orders. You can use QCI actual values in the CPE, applied for goods receipts/issues and invoicing documents. Based on the SAP IS-Oil quantity conversion interface, quantity conversion parameter values (default/actual) can be accessed by the CPF. **Commodity Pricing for Trader's and Scheduler's Workbench (TSW)** You can use this function to derive the CPE reference date from the TSW event date (Planned/Actual) in tickets and nominations. The reference date is used to fetch market price quotations for the price determination in the CPE.

Key Feature	Use
Processing Purchasing Transactions and Documents	You can create and process purchasing contracts (with time-independent conditions), purchase orders, purchase schedule agreements (with time-dependent conditions), goods receipts, as well as provisional, differential and final invoices. You can use the provisional, differential and final invoicing for provisional and final commodity price calculation rules, considering provisional or final market prices, quantities, and qualities, and herewith avoid complex cancellations or rebilling procedures. Together with the commodity pricing the system allows the automatic creation of multiple invoice documents until the creation of the final invoice. In central purchase contracts of the Central Procurement solution you can create and process line items containing commodity data. These line items can be automatically repriced in predefinable cycles.
Period-End Valuation	You can create and post accrual documents, generate worklists, verify valuation results, and perform completeness checks. For commodity quantities with goods receipts, where the commodity price is floating, and a final invoice was not posted yet on or before the valuation key date, the period-end valuation is used to calculate the accrual amount from the difference between an anticipated final invoice amount and the posted amount.

Key Feature	Use
Commodity Risk Analytics	You can perform *Commodity Position Reporting*, *Mark-to-Market Reporting*, and *Profit and Loss Reporting* for logistics documents and material stock. Commodity Risk Analytics supports a snapshot-based and (in most cases) a real-time reporting, calculating risk-relevant key figures at reporting time. Commodity Risk Analytics considers business transactions which has not been realized (not invoiced or not billed) yet. The provided standard queries reflect current day, end-of-day and day-over-day positions and values. You can extend the provided queries in order to append your individual free characteristics. **Commodity Position Reporting** You can analyze the price risk quantities of commodity positions resulting from logistics transactions and material stock. **Mark-to-Market Reporting** You can display undiscounted MtM values for unrealized logistics documents and material stock, as well as the MtM changes between two points of time. **Profit and Loss Reporting** You can examine the root causes for changes in MtM values within a set period, like changes of market quotations, FX rates, modified pricing data and/or commodity quantities in logistics documents and material stock. The P/L attribution shows how much each event and market price movement has attributed to the MtM delta values for a certain period. **Risk Distribution from Documents and Material Stock** For reporting purposes, risk distribution plans in purchasing and sales contracts, and schedule lines in purchase and sales orders serve to determine risk-relevant quantities. Risks-relevant quantities can be derived from material stock, too. **Commodity Risk Analytics for Trader's and Scheduler's Workbench (TSW)** In the Trader's and Scheduler's Workbench you can use a flexible CPE pricing, which allows you to perform enhanced risk assessments with Commodity Risk Analytics.

3.3.4.2 Commodity Risk Management

Business Background

With *Commodity Risk Management* you manage commodity futures, commodity forwards, commodity swaps, listed options, OTC options, and process the respective master and market data.

The *Commodity Risk Analytics* supports you in analyzing commodity price risks for commodity derivative and logistics positions. Starting from commodity derivatives and/or logistics transactions, the commodity price risk-related information is derived from the document flows.

Commodity Risk Management uses selected functions of *Treasury and Risk Management*.

Key Features

The following table explains the available key features:

Key Feature	Use
Market Data Management Based on DCS	You can use market data based on derivative contract specifications (DCS) reflecting rules and conditions agreed upon at an exchange or with other market data providers, and specifies the underlying commodity. You use the DCS for the automatic determination of maturity key dates, quotations, and trading periods. Commodity prices can be manually entered or uploaded. You can use price data of commodity derivative transactions related to DCS-based market data. With the Commodity Pricing Engine you can apply DCS-based market data also for purchasing and sales documents. Based on the DCS and market identification codes (MIC), the price data can be entered for defined price types and key dates, which determine specific contracts. You can use DCS-based commodity curves for market data valuations. For the creation of commodity curves, the system determines available market data and constructs the curve based on existing grid points. You can use the datafeed to upload current and historical financial market data from external market data providers or from other systems to *DCS-Based Market Data Management*.
Master Data Management	You can enter and process master data for the DCS, the underlying commodity, and commodity curves.
Derivative Order and Trade Execution Management (CDOTE)	You can create commodity subaccounts manually or by file uploads. You can process commodity order requests for commodity futures transactions and for the pricing of logistics contracts. You can display documents related to commodity derivative orders you get an overview of the relationship of a specific document and its order request(s). You can group orders by using commodity derivative order brackets. For order requests created you can upload commodity order request fulfillments (fills) and trigger subsequent processes, like the creation of commodity futures transactions. For the electronical communication between a company and the broker, the FIX (Financial Information Exchange) format is supported, a widely-used standard protocol. With this function you can connect to an external FIX engine by producing outbound FIX messages, and processing inbound FIX messages.

Key Feature	Use
Commodity Derivatives	You can enter and process commodity derivatives like commodity futures, commodity forwards, commodity swaps, commodity listed options, and OTC options. You can exercise commodity listed options with commodity futures as underlying transactions. There is a settlement function to support the follow-up processing like payments and postings. You can use a business application programming interface to create, exercise, reverse, or settle commodity derivatives. You can define individual free characteristics, assign them to financial transactions, and use them for reporting purposes. Furterhmore, you can create and change commodity derivatives containing free characteristics by using business application programming interfaces. Free characteristics can be used to slice and dice transactional data in Commodity Risk Analytics.
Correspondence Framework	You can manage your correspondence, standardize your correspondence processes, and create uniform correspondence and results.
Determination of Commodity Price Risks from Commodity Derivatives	With this function commodity price risks are derived from the life cycle of the commodity derivatives, starting from the contract creation until its maturity. Reporting dates of exposure positions are determined by the referenced quotation dates and respective commodity derivatives.

Key Feature	Use
Commodity Risk Analytics	You can perform *Commodity Position Reporting*, *Mark-to-Market Reporting*, and *Profit and Loss Reporting* for commodity derivatives (commodity futures, commodity forwards, commodity swaps, OTC options, and listed options) and/or logistics documents and material stock, for different industries and cross commodities. When creating and changing OTC options and listed options, the option delta factor is automatically calculated and updated by the *Market Risk Analyzer*. When processing commodity derivatives, analytical source data are instantaneously provided for the *Commodity Position Reporting* and *Mark-to-Market Reporting*. You can use a snapshot-based and, in most cases, a real-time reporting, calculating risk-relevant key figures. It allows a conversion of mass and volume unit of measures for all quantity-based key figures, and supports the reporting in quotation, payment, and statistics currency. You can apply individual free characteristics to the provided queries. With *Commodity Position Reporting* you can analyze the price risk quantities of commodity positions resulting from commodity derivatives and/or logistics transactions and material stock. These reports show key figures for outright exposure quantities, priced and unpriced commodity position quantities. With *Mark-to-Market Reporting* you can display undiscounted MtM values, contract values, and market values for commodity derivatives and/or unrealized logistics documents and material stock, as well as the MtM changes between two evaluation dates. You can apply a joint *Commodity Position Reporting* and *Mark-to-Market Reporting* of derivative and logistics transactions. With that you can display risk-relevant data from derivative and logistics transactions. With the *Profit and Loss Reporting* you get an enhanced *Mark-to-Market Reporting* which is aimed to explain the root causes for changes in MtM values between two evaluation dates. The P/L attribution shows how much each event (price and/or quantity change) has attributed to the MtM delta values for a certain period.

3.3.4.3 Commodity Sales

Business Background

With *Commodity Sales* you enter, process and manage your sales documents, deliveries and billing documents for commodities of all industries, perform a simple to use formula-based commodity pricing, also for future dates, use the market data management based on derivative contract specifications, enter and allocate price fixations, and perform period-end valuations.

Key Features

The following table explains the key features available:

Key Feature	Use
Market Data Management	You can apply price data for commodity derivatives based on derivative contract specifications (DCS) published at trading platforms. The DCS is used for commodity futures, listed options, and commodity forwards. It reflects rules and conditions agreed upon at an exchange, and that form the contract basis for trading with a specific commodity or for a specific derivative contract. You can use the DCS for the automatic determination of maturity key dates and DCS periods. The DCS is applied within the Commodity Pricine Engine for sales documents. Except for commodity forwards, based on DCS and market identification code (MIC), price data can also be entered manually for defined price types and key dates, which determine specific contracts. You can also upload market data. You can apply basis market data for the price difference between the local cash price and the commodity futures price. The basis reflects characteristics such as freight, storage costs, quality factors, targeted margin, and the local supply and demand situation. Basis market data can be entered manually and can be accessed by the Commodity Pricing Engine (CPE).

Key Feature	Use
Commodity Pricing	You can apply complex pricing formulas, rules and conditions in a simple way. The commodity pricing engine uses DCS-based market data and basis prices, and is enabled for commodities of all industries. Commodity pricing is applied insales contracts, sales orders, goods issues, provisional billing, final billing, and for the period-end valuation, and comprises the following functions: **Setting Up CPE Formulas, Terms and Rules** You can use CPE formulas, terms and rules that define the pricing of a commodity in a sales document. Formulas consist at least of one term, and can contain detailed pricing rules such as fixed values, or absolute or percentage surcharges. You can set up the price determination as Customizing data or, for regular changes, as master data. If CPE data is applied as master data, pricing data can immediately be used for new sales documents. CPE formulas and reference date routines can be set up application-independent, means for the purchasing and the sales side together. **Formula Assembly based on BRFplus** You can apply a flexible formula determination and defaulted CPE data in sales documents by using the Business Rules Framework plus. For the determination of CPE formulas, terms and rules, you can use template applications with standard access sequences that you can copy and use as it is. **Formula Evaluation** You can use the formula evaluation of the CPE that controls, how formula/term rates and formula/term values are calculated for purchasing documents. For each pricing-relevant process, the formula evaluation is automatically started. During the formula evaluation, the system uses input data such as document data like commodity quantity and quality data, as well as conversion and rounding rules, reference data, price quotations, surcharges, currency exchange rates, and factory calendar data. You can use a specific CPE quotation forecast routine to get price quotations with dates in the future. **Price Fixations and Allocations** To replace the floating price (market price for future date) by an agreed fixed price of complete or partial pricing-relevant commodity quantities in sales documents, you can use the price fixation option. Price fixation options can be defined and exercised on term level. A price fixation option defined in a sales contract, will also be displayed in the subsequent sales order. For sales orders the priced quantity is automatically or manually allocated to the related goods issues quantity. You can create and change price fixations for a document before or after subsequent documents have been created. You can change an allocation as long as the delivery has not been finally invoiced yet.

Key Feature	Use
	You can manually assign price fixations, to see the allocated or not allocated items for a selected sales order, or edit an allocation (re-allocation). You can display an allocation worklist to get an overview of the documents relevant for the allocation, and of the allocation statuses. For the determination of exchange rate forecasts for currency conversions, swap rates can be calculated by using the respective exchange rate forecast routine. **Manage Price Fixation Options** You can, for complete or partial pricing-relevant commodity quantities of logistics documents, replace the floating prices by agreed fixed prices by means of exercising price fixation options. For different currencies you can fix the currency exchange rate. Existing price fixation exercises can be updated or deleted, too. **Tiered Pricing** You can deside to either use the price fixation function or the tiered pricing. With the tiered pricing you can process contracts that include a negotiated price structure, deviated into quantity tiers or date tiers. Within these contracts you can define, adjust, or extend quantity tiers and date tiers. The call-off documents and the delivery documents consume the price information from the tiers. If required, to consume the tiered prices properly, you can change call-off item quantities, or resort deliveries following a certain sequence. **Configurable Parameters and Formulas (CPF) based on BRFplus** You can define complex pricing rules and CPF formulas without programming effort, just by creating additional pricing-relevant parameters, formulas, and using them in BRF plus functions. The CPF with BRFplus enables, for example, an automatic bonus and penalty calculation based on delivered qualities and contract conditions. **Configurable User Interface for Pricing** With this function, you can configure the user interface of pricing data. It enables you to use and to adapt delivered standard views for pricing data, as well as to create customer-specific views. **Agreed Conversion Factors and Quantity Adjustments** • You can specify agreed conversion factors in a business document.You use this function for a condition, if you want to use a conversion factor for a unit-of-measure pair, and the conversion factor deviates from the one in the material master. You can specify one agreed conversion factor per unit-of-measure pair, and assign it to a condition, the current item, or to all items. During pricing, the system searches in this order for agreed conversion factors.

Key Feature	Use
	• You can adjust the quantity that a price condition uses in a sales document. You use this adjustment function, if the quantity that is relevant for the corresponding condition deviates from the quantity of the sales document item. For the selected sales document, the system uses a specific condition type to calculate an adjusted quantity by applying an adjustment factor. Such a condition is called a source condition. Subsequent conditions can use the calculated adjusted quantity or the adjustment factor of source conditions. You can enter the adjustment factor within a sales document in the respective pricing view of the configurable user interface for pricing. **Interfaces for CPE and CPF Data** You can use the CPE interface to read CPE data from database tables and to add, change and delete CPE data. Analogous to this, with the CPF interface it is possible to read CPF data from database tables to add, change and delete CPF data. **Commodity Pricing for Global Trade Management (GTM)** For the pricing of document items of GTM documents you can use CPE and CPF conditions, including quantity adjustment conditions. Adjusted quantities can be consumed by CPE conditions. Within the CPE, GTM Pricing and Payment Events (PPE) can be selected from the reference date routines. **Commodity Pricing for Oil and Gas (SAP IS-Oil)** You can use SAP IS-Oil-specific QCI default values for quantity conversions in the CPE, applied in contracts and orders. You can use QCI actual values in the CPE, applied for goods receipts/issues and invoicing documents. Based on the SAP IS-Oil quantity conversion interface, quantity conversion parameter values (default/actual) can be accessed by the CPF. **Commodity Pricing for Trader's and Scheduler's Workbench (TSW)** You can use this function to derive the CPE reference date from the TSW event date (Planned/Actual) in tickets and nominations. The reference date is used to fetch market price quotations for the price determination in the CPE.
Processing *Commodity Sales* Transactions and Documents	You can create and process sales orders, sales contracts, deliveries, as well as provisional, differential and final billing documents. You can use provisional, differential and final billing for provisional and final commodity price calculation rules, taking into account provisional or final market prices, quantities, and qualities, and herewith avoid complex cancellations or rebilling procedures. Together with the commodity pricing the system allows the automatic creation of multiple billing documents until the creation of the final billing document.

Key Feature	Use
Period-End Valuation	You can create and post accrual documents, generate worklists, verify valuation results, and perform completeness checks. For deliveries of commodities with goods issues, where the commodity price is floating (for example, due to market price changes), and a final invoice was not posted yet on or before the valuation key date, the period-end valuation is used to calculate the accrual amount from the difference between an anticipated final invoice amount and the posted amount.
Commodity Risk Analytics	You can perform *Commodity Position Reporting*, *Mark-to-Market Reporting*, and *Profit and Loss Reporting* for logistics documents and material stock. Commodity Risk Analytics supports a snapshot-based and (in most cases) a real-time reporting, calculating risk-relevant key figures at reporting time. Commodity Risk Analytics considers business transactions which has not been realized (not invoiced or not billed) yet. The provided standard queries reflect current day, end-of-day and day-over-day positions and values. You can extend the provided queries in order to append your individual free characteristics. **Commodity Position Reporting** You can analyze the price risk quantities of commodity positions resulting from logistics transactions and material stock. **Mark-to-Market Reporting** You can display undiscounted MtM values for unrealized logistics documents and material stock, as well as the MtM changes between two points of time. **Profit and Loss Reporting** You can examine the root causes for changes in MtM values within a set period, like changes of market quotations, FX rates, modified pricing data and/or commodity quantities in logistics documents and material stock. The P/L attribution shows how much each event and market price movement has attributed to the MtM delta values for a certain period. **Commodity Risk Analytics for Trader's and Scheduler's Workbench (TSW)** In the Trader's and Scheduler's Workbench you can use a flexible CPE pricing, which allows you to perform enhanced risk assessments with Commodity Risk Analytics.

3.3.4.4 Deal Capture

Business Background

With *Deal Capture*, you capture trader negotiations and create the logistical documents that are required by subsequent processes, standardizing deal entry while also integrating with downstream documents process flow.

Key Features

The following table explains the key features available:

Key Feature	Use
Record purchases and sales negotiations	You can record your purchase and sales negotiations on a single interface that allows you to easily capture information such as: • Measurements • Accounting • Delivery • Pricing • Contractual terms • Pricing with fixed, index, or exchange for physicals (EFP) prices • Secondary costs, including estimated costs or settlement-relevant costs
Renewable fuels information	You can implement Business Add-Ins (BAdIs) to configure how you want to record renewable fuels information such as the following: • Renewable identification numbers (RINs) • Low carbon fuel standard (LCFS) information • Credit deals (for example, over-the-counter RINs) Additional non-US regulations can be configured and used in a manner similar to RINS/LCFS.
Deal plant and optionality breakdown	You can implement and configure BAdIs for optionalities. Mode of transport (MOT) options are integrated into Trader's and Scheduler's Workbench (TSW) when deals are mapped into Sales and Distributions (SD) and Materials Management (MM) documents. Selected options for products, payment terms, incoterms, MOT, and locations can be used to validate their selections during purchase order (PO) and sales order (SO) creation.
Generation of MM and SD contracts with SAP Oil and Gas (IS-OIL) data	Deal capture generates, updates, and deletes MM and SD contracts to support logistics execution. In addition, IS-OIL data, such as quantity schedules (QS) and TSW details, is updated in MM and SD contracts.

Key Feature	Use
Integration with commodity pricing: commodity pricing engine (CPE) and configurable parameters and formulas (CPF)	The integration with CPE and CPF allows you to capture the following price information: • Standard prices for fixed rate, flat prices, and quantity scales • Simplified CPE prices with quotation, reference dates, time definitions, and surcharges • CPF prices using a simplified CPF structure that displays parameters based on standard CPF elements • CPF prices with more complex parameter calculations using scales
Deal notifications	You can set up notifications to alert a defined set of users about specific actions.
Audit logs	You can use audit logs to check which details were changed in amended deals. The storage of audit data leverages standard change document mechanisms which supports further reporting.
Deal drafts	You can save a deal in a draft status at any time. Drafts can be shared between users so that one user can start creating a draft and another user can finish and publish the draft.
Deal templates	If you regularly reuse certain deal structures, you can create templates to speed up the deal entry process.
Authorization for roles	You can configure roles based on your company's needs. Authorization objects can be used to restrict which users can perform actions such as the following: • Publishing and amending deals • Searching for and displaying deals • Voiding deals • Viewing of certain product types, company codes, and deal types in the applications • Saving templates • Publishing unblanced intra-strategy deals
Deal publishing with Flexible Workflow integration	You can use the default flexible workflow definitions or the provided BAdis to create approval processes that can: • Control when drafts are published • Control when published deals can be used on subsequent documents such as POs and SOs

3.3.5 Financial Operations

3.3.5.1 Receivables Management

3.3.5.1.1 Collections Management

Business Background

Collections Management supports you in proactive receivables management and collecting outstanding receivables. Using collection strategies, you can valuate and prioritize customers from a receivables management view. Customers that fulfill the rules defined in a strategy are distributed to work lists. You can call up your work lists and initiate contact with your customers in their order of priority. Once you have contacted the customer, you can document the result by creating a promise to pay, by setting the customer to resubmission or, if you are also using dispute management, by creating a dispute case.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing Master Data	You can manage collection-specific data of business partners and use it for integration with other functions. Data, such as risk class and score, is included to the collection profiles of your business partners, if you are also using credit management.
Creating Work Lists	You can create collections work lists based on your collections strategy and team management principles and based on the accounts receivable data.
Customer Contact	You can prepare customer contact by checking valuation of customers according to your collection strategy. You can get an overview of customer accounts and view past contacts and past payments. You can check resubmissions and choose contact persons.
Supporting Collections Activities	As a collector on the phone, you can renew promises to pay, create resubmissions and document your customer contacts. If you are also using dispute management, you can create dispute cases.
Monitoring of Incoming Payments	You can check, whether incoming payments are received as promised and, if you are also using dispute management, you can check the dispute status of payments.

Key Feature	Use
Supervise Collection Process	As a team leader, you can monitor the work list progress and reassign work list items. You can assign the work list items to the collection specialists, both, manually and automatically.

3.3.5.1.2 Credit Evaluation and Management

Business Background

The creditworthiness and payment behavior of your business partners affect the business results of your company immediately. You use credit evaluation and management to reduce the risk of financial losses and to optimize business relationships with your business partners. It supports your company in determining the risk of losses on receivables from your business partners early and in making credit decisions efficiently, and even automated.

Key Features

The following table explains the key features available:

Key Feature	Use
Master Data	You can manage all credit-relevant master data of a business partner. This data includes the current credit limit, credit score and the risk class. Master data fields have a change history with information about the user, the time of change and the changed values.
Business Partner Scoring	You can have the scores determined by the master data of the business partner, as for example by the country/region of origin, or by the payment behavior.
Credit Limit Request	You can calculate the credit limit of a business partner automatically and implement an approval procedure where changes to a credit limit can be checked and approved by a the credit controller responsible.
Credit Evaluation and Analyses	You can display credit-relevant data of your business partners, such as payment behavior summary, credit exposure or credit limit utilization. You can analyze credit profiles and credit limit utilization of business partners.

Key Feature	Use
Documented Credit Decision	To make decisions about blocked sales orders or the amount of the credit limit quickly, credit evaluation and management supports the credit controller in determining the required customer-related data and analyses. Negative credit decisions are saved, together with the data that lead to the decision as documented credit decisions. You can process blocked sales orders in a work list with documented credit decisions.

3.3.5.1.3 Dispute Resolution

Business Background

Dispute resolution allows you to investigate and resolve dispute cases for open invoices. For example, in business relationships, business partners frequently reduce the amounts of payments. These reductions have usually not been agreed with the payment recipient and therefore, the payment recipient has to investigate and resolve them. With dispute resolution, you can organize and store all information and documents related to a dispute case. This includes data that already exists in accounting and new data that you enter when creating a dispute case. The dispute cases can be processed by the colleagues responsible in your company.

Key Features

The following table explains the key features available:

Key Feature	Use
Organizing Documents Related to Dispute Cases	You can organize and store all information and documents related to a dispute case, such as sales orders, invoices, or attachments.
Processing Dispute Cases	You can create dispute cases, for example when post processing an account statement or during analysis of overdue open items. When you create a dispute case, the system copies automatically information from the journal entry, for example, the disputed amount, into the dispute case. You can also configure the system so that dispute cases are opened or closed automatically based on payments received. You can set and release dunning blocks and create correspondence, either manually, or configure the system so that correspondence is sent automatically to your customers.

Key Feature	Use
Integration with Accounts Receivable	You can manage dispute cases that refer to accounts receivable, such as underpayments or overdue items. You can make dispute cases visible in the accounting transactions and update the information in the dispute case in clearing transactions, such as in incoming payments or offsetting credit memos. So you can include other colleagues and departments in finding a solution to the dispute case from transactions that they know. All colleagues can check the current status of the dispute case. In clearing transactions, the dispute cases are updated automatically and the processor of the dispute case is always informed about the last activities in accounting.
Assigning Credit Memos and Payments	You can assign credit memos and payments to open invoices. When the system clears an invoice for which a dispute case with credit memo or payment exists, the dispute case is updated.
Analyzing Dispute Cases	Reporting allows you to detect quality issues, control the workload, track the dispute process, and manage deductions per customer.

3.3.5.2 Contract Accounting

Business Background

Contract Accounting provides the same functional scope as the Contract Accounting and Credit and Collections Management capabilities as part of Billing and Revenue Innovation Management.

Related Information

Contract Accounting [page 356]
Credit and Collections Management [page 358]

3.3.5.3 SSF Service Configurator

Business Background

Shared Service Organizations (SSO) rely on the standardization and automation of workflows and processes. The Shared Services Framework (SSF) Service Configurator allows you to meet these requirements by modelling and reorganizing your shared service processes for your SSO.

Key Features

The following table explains the key features available:

Key Feature	Use
Decision-based checklist	Allows you to define process flows tailored to your requirements, assign responsibilities, trigger automated workflows or other actions.
Service-based form definition	Easily create custom-made forms with header and line item information, automated validation of input against the back end, and definition of mandatory and optional input fields.
Document posting	Automatically post collected and validated information to various transactions with one click.

3.3.6 Billing and Revenue Innovation Management

Billing and Revenue Innovation Management (BRIM) monetizes digital business models. It is tailored towards the requirements of corporates across all industries and lines of business with high volumes of customers, subscriptions, and pay-per-use transactions. It provides flexible billing processes, enables multi-sided business models, and manages resulting revenues and expenses with high automation and throughput. Key business and process capabilities include the following:

- Subscription business models with recurring- and one-time charges
- Rating and billing of millions of usage transactions converged from multiple transactional platforms
- Complex, volume-based discounts and surcharges
- Revenue sharing and partner settlement

3.3.6.1 Subscription Order Management

Business Background

Subscription Order Management is specifically designed to support the order process of a combination of physical goods, service, and subscriptions to enable you to transition from a product-based model to a service-based one. You can quickly model new subscription offerings with the right mix of products, recurring and one-time services, usage charges, revenue sharing models, and third-party content. With Subscription Order Management, you manage your contracts flexibly over the whole contract lifecycle (such as adding, modifying, or removing elements of contracts effortlessly, and tracking of service usage).

> **i** Note
>
> To use the full functionality of Subscription Order Management, you must have already setup SAP S/4HANA for Billing and Revenue Innovation Management.

Key Features

The following table explains the key features available:

Key Feature	Use
Product Modelling	A subscription product provides specific attributes and settings for leveraging payment models, using recurring fees and consumption-based fees (or pay-per-use payment model). You can model subscription products and can group them into product bundles consisting of different types of products, such as subscription and physical products, services, or service contract items, to provide a flexible offering to customer.
Price Modelling	In Subscription Order Management, you can use various types of fees and charges (recurring fees, usage and one-off charges), and allowances, for price modelling. You can also share your counters and allowances across multiple contracts.
Master Agreements	A master agreement is a contract that is used to define the terms of a long-term relationship between a customer and a service provider, using individual prices, products, and authorized groups. These terms are used in the related subscription orders and solution quotations.
Quoting and Order Capture	Solution quotations and subscription orders are used to offer customers a combination of products, product bundles, and services. Once released, they automatically trigger the creation of subscription contracts, and other follow-up documents like sales order or service contracts.
Document Distribution	The distribution of subscription documents is critical in fulfilling subscription order and contract terms across systems like billing, charging, and other fulfillment systems. The document distribution is implemented by the Order Distribution Infrastructure (ODI) framework.
Contract Lifecycle Management	A subscription contract manages the long-term agreement for a service that the provider company offers to the customer. You can use contract change processes to change your subscription contract lifecycle, such as contract extension, contract transfer, and contract cancellation. You can also define phased contracts with multiple phases with varying attributes across each phase.

Key Feature	Use
Revenue Sharing	In a service-model, partner agreements are created to maintain revenue sharing terms between service and content providers. So, when an end customer purchases a service, the involved content partner is given a part of the revenue based on the contract that the service provider finalizes with the end customer.
Mass Runs	In addition to creating subscription orders in bulk, mass runs allow the mass change of subscription contracts. The framework offers mass run definition UIs that define attributes and parameters for different types of mass runs. It ensures parallelization concepts, process tracking, and result monitoring in Subscription Order Management.
Integration	Subscription Order Management provides APIs to connect the business processes across your system landscape and integrate with external consumers of your service.

3.3.6.2 Convergent Invoicing

Business Background

Convergent Invoicing merges information from several billing streams as well as individually rated events. It enables service providers to consolidate charges into a single invoice and give a complete view of the customer. Providers can accommodate partnerships with third parties and ramp up new services by clearly delineating which party is responsible for any given charge. They can also manage sophisticated rules for invoice-level discounting. By greatly simplifying complex billing processes, providers can give customers a single, consolidated invoice, while delivering better, more personalized services.

Key Features

The following table explains the key features available:

Key Feature	Use
Receive, manage, and rate consumption information	In cases where the price of individual consumption events depends, for example, on the overall consumption during a billing cycle, Convergent Invoicing provides the option of storing consumption items as unrated events until they can be rated. In this case consumption information, received from a technical system, such as a mediation system, is stored and can be displayed and monitored to later trigger rating. Rated consumption information received from (external) rating systems is stored in the form of billable items depending on their status, and subsequently billed. Convergent Invoicing comprises a billing and an invoicing component. Billing manages billable items and groups and aggregates them based on business rules into billing documents, which you process further in invoicing through to the creation of the invoice to the customer.

Key Feature	Use
Bill usage of services, prepare data for invoice creation and trigger posting in Accounting	During bill calculation, you enter priced transactions from a rating system and additional data from other components as billable items to create structured bill content. Billable items can represent event detail records, call detail records, billing detail records, recurring charges, one-off charges, and other charges or credits to be billed. You can use a billing plan to define: • Dates and amounts for generating individual billable items • Periods and amounts for generating recurring charges Complex discount calculations can be applied to entire business hierarchies using master agreements, as well as to individual contracts. The discount calculation is based on discount rules which can consider all details contained in the billing data. From the invoicing data, Convergent Invoicing can generate print documents which you can forward to connected printing systems. During invoicing, Convergent Invoicing creates invoices and updates these directly in Contract Accounts Receivable and Payable. Convergent Invoicing offers flexibility in posting revenues, depending on the relevant accounting principle (for example, IFRS). Intercompany settlement in Convergent Invoicing supports business between two companies that belong to the same corporate group. One subsidiary issues an invoice to the customer, while the actual service is performed by another subsidiary. You can transfer pre-aggregated invoicing data from one or more billing systems (SAP internal or external) into the invoicing process. For example, you can integrate invoicing data from Sales and Distribution into the invoicing process. The invoicing data received from the source applications can be combined to create one convergent invoice for the customer. In Contract Accounts Receivable and Payable you can add information to invoices and update them. This additional information can include open receivables from previous invoices, information about received payments, or additional charges, as for example, late payment charges or interest on overdue items. To apply changed prices or conditions, Convergent Invoicing provides rerating of consumption items for the complete inventory of stored consumption items of a contract for a given period. During rerating, billable items are reversed, and the consumption items are rated based on the changed prices and conditions. If you want to define business hierarchies, Convergent Invoicing supports you with the definition of master agreements. Using master agreements, you can group your business hierarchy members for invoicing (layout, recipient, payer, additional invoice statements) and define complex discounting rules for each

Key Feature	Use
	member. For example, you can define which services are reduced in price and which members of the hierarchy profit from the reduction. When a member of the hierarchy, which is eligible for a master agreement, closes a contract the existing master agreement is referenced and the terms negotiated within the master agreement automatically apply to this member.
Exception handling	If issues occur during the processing of invoicing documents and during invoice creation, you can stop automatic processing and continue with manual postprocessing in dialog. You can define additional checks within the invoicing process, which can trigger the creation of clarification cases and make data available for postprocessing if the situation requires. If events have been rated using an incorrect price, you can rerate all consumption events. If the system used incorrect consumption or billing data, you can change, enhance, or replace the data which is then subsequently processed in the standard billing and invoicing processes. If an incorrect amount has been invoiced, you can create a credit memo or debit memo.

3.3.6.3 Contract Accounting

Business Background

Contract Accounting receives and manages a large number of postings, for example created by billing processes, and uploades these postings to the general ledger.

All commonly used payment methods for incoming and outgoing payments in your enterprise are processed.

Contract Accounting enables billing professionals to assign individual clearing strategies, automate payment reconciliation, and generate reports aligned with accounting principles. Processing payments in a highly automated environment enables the billing team to reduce days sales outstanding and processing costs.

The software has been tailored towards the requirements of corporates across all industries and lines of business with high volumes of customers, subscriptions, and pay-per-use transactions. The processes provided with Contract Accounting are highly flexible to allow for a maximum of automation as well as mechanisms to ensure outstanding system performance and scalability.

Key Features

The following table explains the key features available:

Key Feature	Use
Posting of documents to enter business transactions	Postings are always saved in document format. The document is a statement for each business transaction. Postings are usually generated automatically by the corresponding business processes or by invoicing. Additional options for automatic data transfer are available. Documents can also be posted manually. When a document is posted, accounts are determined automatically for G/L Accounting. All receivables, payables, revenue and expense accounts are automatically determined based on account assignment details in the line items.
Payment and Receivables processing	Contract Accounting provides standard accounts receivable and accounts payable functions, which you use to manage and monitor the receivables due from your customers. The various business processes for payments provided can be classified as follows: • Automatic payment by your company This processing can be performed for all outgoing and incoming payments if the customer has granted your company the corresponding authorization. • Process incoming payments using lots The customer makes payments through the bank or post office. • Cash desk and cash journal The customer makes payments directly at your company An account may contain open debit and credit items. If they balance to zero or if there are small differences that are within the tolerance limits defined, these amounts can be cleared automatically or manually. If a customer is unable to honour their financial commitments, you can make a deferral or installment plan agreement for one or more receivables.
General Ledger Integration	Each individual business transaction, that is, each posting and each document for a given customer, is stored in order to ensure itemized verification. In view of the large document volumes, sales figures are not updated consecutively in the general ledger during posting. Instead, documents are periodically transferred to the general ledger. All standard closing activities, as for example, foreign currency valuation, receivables adjustment and revenue deferral are supported.

Key Feature	Use
Integration with SAP Cash Application for Contract Accounting	You can integrate SAP Cash Application for Contract Accounting to automate and simplify further the processing of incoming payments with machine learning intelligence. Contract Accounting processes incoming payment data with a high degree of automation, achieved by applying configuration options. If exceptions occur during automatic processing, the system creates clarification cases for manual follow up activities. For these clarification cases, SAP Cash Application for Contract Accounting analyzes the notes to payee transferred with the bank statement and makes clarification proposals with a confidence rating.

3.3.6.4 Credit and Collections Management

Business Background

Credit and Collections Management provides reliable, comprehensive credit scoring of new and existing customers based on historical customer data integrated with external credit rating agencies. It fully automates routine tasks in the collections process for mass volumes of customers, such as the calculation of interest payments. Billing personnel can change and continuously optimize collections strategies by using Champion/Challenger analysis as well as in-house teams and external collections agencies. A complete picture of the credit and collection history of new and existing customers enables providers to reduce days sales outstanding and the risk of nonpayment, while retaining loyal customers.

Key Features

The following table explains the key features available:

Key Feature	Use
Customer segmentation based on risk classes and payment behavior	You can put your customers into segments with regard to their credit risk, control and continually monitor sales and service processes, and respond immediately when exceptional situations arise. The segmentation takes place in Credit Management, whereby external credit information, such as D&B® and Experian, and internal credit information, such as the length of the business relationship and the payment behavior, are considered. The external and internal credit information from the different systems are saved in the master data of the business partner. This risk-based segmentation has an influence on the collection process.

Key Feature	Use
Determination and execution of collection activities	You can evaluate the open receivables of your customers (due or not yet due) as regular intervals using different parameters, such as age and amount of the receivables, and collection history and risk class of the customer. Using business logic defined in the system settings, the system derives the relevant collection activities for each customer, such as sending reminders, creating work items for the collection specialist, and the submission of receivables to external collection agencies or to third-party applications for legal dunning procedures. Collection specialists have a detailed overview of their customers and access to all the necessary tools and functions for the required measures. Heads of department can track the progress of Collections Management at all times and, if necessary, take action.

3.3.6.5 Financial Customer Care

Business Background

Financial Customer Care provides your customer service agents with the tools to handle customer financial inquiries efficiently and consistently.

Key Features

The following table explains the key features available:

Key Feature	Use
Accounts Receivable Collection	Manage within a customer contact collection activities and payment arrangements to reduce the number of days sales outstanding.
Overview of a customer's financial details	Answer customer financial inquiries quickly

3.3.6.6 Country/Region-Specific Features in Billing and Revenue Innovation Management

Key Features

The following table explains the key features available for the countries/regions:

Country/ Region	Key Feature	Use
Argentina	Taxes in Company Codes	The following functions are available that fulfill legal requirements relating to taxation for IS-U: • Two-step tax determination • VAT perception and GI perception • Tax exemptions • Transfer of Argentina-specific fields of the contract account to the FI-CA document
	Sales and Revenue Tax Reports	You can prepare sales and revenue tax reports, such as the VAT fiscal position, municipal tax declaration, gross income tax declaration, daily VAT report with magnetic output, VAT perception, or gross income perception, Legal Document Reporting According to GR 3571.
	Authorization Codes for Invoices Issued by Utility Companies	You can assign C.E.S.P. authorization codes (Código Electrónico de Servicios Públicos) to invoices and also print the codes on the invoices.
	Official Document Numbering	You can use official document numbering (ODN) to number the documents issued by your company. An official document number is an ID that is printed on an outgoing document. It uniquely identifies the document.
	Invoicing of Currency Translation Differences	When invoice amounts remain open after payment in an alternative currency, you can update an invoicing order for these amounts using function modules in event 0020. You can bill the customer again for remaining receivables resulting from translation differences. A new invoice is used to bill for the remaining open amount.
Australia	Payment Medium Formats	You can use a payment medium format when creating the payment file to be sent to the bank.
Austria	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Belgium	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Electronic Bank Statements	You can convert incoming bank statement files to the necessary format for import.

Country/ Region	Key Feature	Use
	Annual Tax Return	You can collect and list all those sales transactions with business partners that meet the following criteria: • The business partner is subject to tax payment • The amount of the sales transaction reaches the minimum amount defined by law
Brazil	Prenotifications	You can process prenotification, such as creating a prenotification file in a format you can send to Brazilian banks, processing a return file from the bank in the Autodebit format, displaying prenotification history, or changing the processing status of a prenotification record and specify a payment block.
	Cancellation of Direct Debit Payments	The standard payment process is enhanced so that canceled payment orders are reported in the next payment run, and all payment orders to be canceled are included in a single outgoing file to the bank.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Electronic Bank Statements	You can convert incoming bank statement files to the necessary format for import.
	Boletos	You can create, reverse, and process boletos.
	Convergent Invoicing for Service Nota Fiscal	Convergent Invoicing allows you to generate fiscal documents for the invoicing of services rendered according to legal requirements established by municipal tax authorities in Brazil.
	Numbering of Outgoing Files	You can set sequential numbering to all outgoing files you create and send to the bank, such as the direct-debit payment files, prenotification or boleto DME files, C remittance files to report update errors.
	Official Document Numbering and Business Place	You use official document numbering (ODN) for Utilities to generate the official document number used to uniquely identify a Nota Fiscal.
Bulgaria	VAT Reporting	You, as a company registered under VAT can file with the tax authorities monthly VAT returns together with purchase and sales ledgers.
	Cash Points	You can pay electricity bills in cash through cash points.
Canada	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Chile	Convergent Invoicing	You can use the convergent invoicing process to create Convergent Invoicing documents. Additionally, Electronic Tributary Documents (DTE) are automatically created for these Convergent Invoicing documents that can be sent to the Chilean tax authorities, Servicio de Impuestos Internos (SII) via the eDocument cockpit.

Country/ Region	Key Feature	Use
Czech Republic	VAT Transfer of Credit Memos	You may apply for VAT deduction (decrease of the output tax) from a credit memo issued to a customer only if the customer confirms the credit memo. You can use a report for processing the VAT transfer.
	Payments	You can use a number of features to assist the processing of payment files and payment data, such as creating and reading files, moving payment data Finance, or setting up payment order for B cheques.
	VAT Ledger Data	You can display all the documents that you must transfer to the Finance component and insert them there in the VAT ledger for a given reporting period. You can also display VAT ledger periods to check if there are any new documents that must be transferred to Finance for a given reporting period, or to check if any document has already been transferred to Finance earlier.
Denmark	Prenotifications	You can create prenotification files in the payment medium format PBS_PRENOTE. The system generates a 605 file that contains master data, which you can then send to PBS. The following prenotification functions are available: creating prenotification files, processing return files, display prenotification history, update processing status.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Finland	Prenotifications	The following prenotification functions are available: processing return files, display prenotification history, update processing status.
	Electronic Bank Statements	You can convert incoming bank statement files to the necessary format for import.
France	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Germany	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Greece	Official Document Numbering and Business Place	You use official document numbering (ODN) in Contract Accounts Receivable and Payable (FI-CA) for IS-U to generate the official document number used to uniquely identify an invoice.
	Business Partner Transaction Data for Annual Sales and Purchases	You can include business partner transaction data in the Annual Sales and Purchases Collective (MYF) report.
	Cash Payment Documents	You can list all cash payment documents for a specific period. The list includes legally required information about the cash receipts that correspond to the payment documents such as the Legally Required Document Numbers.

Country/ Region	Key Feature	Use
	Accounts Receivable Ledger	You can display a list of contract accounting balances and the corresponding contract accounting documents for a selection of business partners and contract accounts for the specified period and calculate and store contract account balances.
	Accounts Receivable Trial Balance	You can display a list of contract accounting balances for a selection of business partners and contract accounts for the specified period and calculate and store contract account balances.
	Document Journal for Contract Accounts Receivable and Payable	You can create a document journal that contains data from the document headers and items of the documents selected.
Hungary	Domestic Sales and Purchases List	You can generate an XML file that contains a list of tax-relevant incoming invoices from your company in a certain declaration period. The outgoing invoices are excluded from the report from July 1, 2018. For earlier reporting periods (before July 1, 2018), the report still selects the outgoing invoices.
	Display IVA Write-Backs for Overdue Receivables Written Off	When you write off an overdue receivable, you must write back any individual value adjustment (IVA) that has been posted earlier. You can use this report to list those write-back transactions of individual value adjustments that have been posted due to the write-off of an overdue receivable, that is, the original document for the receivable has clearing reason 04 (Write-Off) or 14 (Mass Write-Off).
	Correction Invoices	You can enter a reference to the original invoice or to the previous correction invoice in a correction invoice. You can also calculate and display corrections on item level in SAP Convergent Invoicing.
India	Security Deposits	You can use the following enhancements in the security deposit function: • Mass change of security deposit amounts • Enhanced interest calculation on security deposit • Tax Deducted at Source (TDS) on security deposits
	Withholding Tax	You can use this function to process withholding tax for each posted document in your system.
Ireland	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Italy	VAT Reporting	You can generate a value-added tax (VAT) return that lists all documents that have been assigned an official document number for the current month. The report selects documents with an ODN based on the invoice or credit memo posting date and reports VAT on sales transactions posted.
	Official Document Numbering	You can assign a unique official document number to and print on all documents that you send to customers. It later serves as the basis for value-added tax reporting.

Country/ Region	Key Feature	Use
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Invoice Data Declaration Report	In Italy, companies must report their invoice data to the tax authorities on a quarterly basis. You run the Invoice Data Declaration Report for Italy (FI-CA) report to generate specific FI-CA invoice data that is required by the Italian authorities.
	eDocument	You use the eDocuments for Italy (FI-CA) solution to create eDocuments, that is, to transform SD billing documents into predefined exchange formats and transfer them electronically to external systems, such as to the systems of Italian legal or tax authorities.
Japan	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Electronic Bank Statements	You can convert incoming bank statement files to the necessary format for import.
Luxembourg	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Mexico	Deferred Tax Reporting	You can create a transfer posting per deferred tax code for all paid deferred tax items by transferring the amounts from the deferred tax accounts to the normal (non-deferred) tax accounts.
	Withholding Tax Postings	You can perform the actual posting for the withholding tax item at the time of invoicing using the invoicing function 'Automatic Account Maintenance'.
Netherlands	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
New Zealand	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Norway	Accounts Receivable Ledger	You can generate a list of contract account balances and the corresponding contract accounting documents.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Electronic Bank Statements	You can convert incoming bank statement files to the necessary format for import.
	Payment Order Cancellation	You can send a payment file to the bank containing information on the cancellation of a payment order.

Country/ Region	Key Feature	Use
Peru	Convergent Invoicing	You can use the convergent invoicing process to create convergent invoicing documents for Peru. Additionally, electronic documents are automatically created for these convergent invoicing documents that can be sent to the tax authorities via the eDocument cockpit.
Philippines	Deferred Tax	You can create a transfer posting per deferred tax code for all paid deferred tax items by transferring the amounts from the deferred tax accounts to the normal (non-deferred) tax accounts.
	Official Document Numbering and Business Place	You use official document numbering (ODN) in Contract Accounts Receivable and Payable (FI-CA) for IS-U to generate the official document number used to uniquely identify an invoice.
	Official Receipts	You can generate official receipts using additional functions for tax notifications.
Poland	Correction Invoices	You can create correction invoices with a reference to the original invoice or the previous correction invoice.
	Tax Adjustment of Overdue Invoices	You can reclaim the tax amount of those invoices that are overdue by a certain number of days (for example, by 150 days) as defined by law. To do so, you adjust and transfer post these tax amounts, and then you can display them using a report. You then submit the list to the tax authorities to reclaim the sum of the tax amounts.
	VAT Split in Payments	You can set your system and apply the VAT split mechanism in your payments in the Contract Accounts Receivable and Payable (FI-CA) component.
	VAT Register	You can collect and display all the contract accounting documents that belong to partial and settlement invoices of billing transactions, and that are tax-relevant.
	Trial Balance	You can display a list of contract accounting balances for a selection of business partners and contract accounts for the specified period and to calculate and store contract account balances
	Business Partner Ledger	You can display a list of contract accounting balances and the total amounts of the corresponding contract accounting documents for a selection of business partners and contract accounts for the specified period. You can also display the document line items for all the business transactions that have been posted and issued during the specified period and to calculate and store contract account balances.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Portugal	VAT Declaration	You can generate the data relevant for either the monthly or annual VAT declaration and to transfer this information to the VAT declaration forms provided by the Portuguese authorities.

Country/ Region	Key Feature	Use
	Creation of Standard Audit Files for Tax Purposes (SAF-T)	You can create a standard data export file called Standard Audit File for Tax Purposes (SAF-T) to store all tax-relevant data in XML format. You must submit this file on a monthly basis to the tax authorities.
	Official Document Numbering	You can define official document numbers to be assigned to documents issued by your company to ensure documents are numbered without any gaps.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Digital Signature	You can generate digital signatures for documents that have official document numbers. This applies to equivalent documents and receipts of sale for taxpayers of Corporate Income Tax (IRC).
Romania	Sales Journal	You can create the sales journal print file in accordance with legal requirements.
	VIES Declaration 394	You can prepare file for 394 Declaration in accordance with legal requirements.
	Cash Journal	You can create cash journal files in accordance with the legal requirements.
Russia	VAT Transfer of Special VAT Operations	You can process the value-added tax (VAT) of goods that are exported abroad. When companies export goods and the customers fully confirm the business transaction within a predefined period of time, the company does not pay VAT for these export transactions.
	Invoicing	You can use SAP Convergent Invoicing to create tax invoices and the related correction tax invoices and revision tax invoices according to the legal requirements in Russia. You have configured gapless and sequential official document numbering for your tax invoices, correction tax invoices, and revision tax invoices.
	Cash Journal	You can prepare the cash ledger and registration journal reports.
	VAT Reporting	You can prepare the sales ledger, purchase ledger, and invoices journal used for VAT reporting.
Slovakia	Payments	You can use a number of features to assist the processing of payment files and payment data.
	Electronic VAT Ledger	You can collect, maintain, and archive data for the electronic VAT ledger.
Slovenia	Tax Book for Incoming or Outgoing Invoices	You can produce the Tax Book for Incoming and Outgoing Invoices report on request by the tax authorities with tax amount details on the business partner level.

Country/ Region	Key Feature	Use
	Invoices of Cash Payments	You can create files that include data on invoices of cash payments in accordance with legal requirements. The files contain data on all the invoices for each business transaction of the sale of goods and services that are partially or fully paid by cash.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
South Korea	Tax Invoices	Your customers can use tax invoices as documentary evidence for tax on sales/purchases paid. In SAP Convergent Invoicing, you can generate a tax invoice using the additional function for tax notifications.
	Returns for Tax on Sales/Purchases	You use tax on sales/purchases returns to report input and output tax to the tax authorities.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Spain	Electronic VAT Register Books with SII	The Electronic VAT Resister Books with SII serves as the delta documentation for the Electronic VAT Resister Books with SII for Finance.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Electronic Bank Statements	You can convert incoming bank statement files to the necessary format for import.
	Official Document Numbering and Business Place	You use official document numbering (ODN) in Contract Accounts Receivable and Payable (FI-CA) for IS-U to generate the official document number used to uniquely identify an invoice.
Sweden	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
Switzerland	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	QR-Bill	You can use the QR-bill function in Contract Accounting that contains not only billing data, but also integrated payment details, a QR code, and a receipt.
Thailand	Deferred Tax	You can create a transfer posting per deferred tax code for all paid deferred tax items by transferring the amounts from the deferred tax accounts to the normal (non-deferred) tax accounts.
	Tax Invoices	In SAP Convergent Invoicing, you can generate a tax invoice/receipt using the additional function for tax notifications.

Country/ Region	Key Feature	Use
	Official Document Numbering and Businss Place	You use official document numbering (ODN) in Contract Accounts Receivable and Payable (FI-CA) for IS-U to generate the official document number used to uniquely identify an invoice.
Ukraine	Tax Reporting	You can use the following reports for tax reporting: • Reports for processing tax invoices and correction tax invoices • Register of issued invoices • Reconciliation report
	Invoicing	You can use SAP Convergent Invoicing to create tax invoices and correction tax invoices.
United Kingdom	Prenotifications	Before a company submits a debit (or credit) request to a bank account belonging to a customer, it sends a file with master data to verify the accuracy of the account data. A company sends this file to the paying bank or, in many cases, a clearing house that will perform the actual validation and later the debits and credits. In the system, this process of validation is called prenotification. The following prenotification functions are available: creating prenotification files, processing return files, display prenotification history, update processing status.
	Debit Memo Notifications Using BACS	You can use the following functions for debit memo notifications using BACS: • Notification of debit memos to the business partner within the prescribed period. You can create the correspondence required with correspondence type 0033. • Creation of debit memos and transfers using the corresponding transaction codes (first debit memo, standard debit memo, new debit memo after a bank return, credit memo).
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
United States	Prenotifications	Before a company submits a debit (or credit) request to a bank account belonging to a customer, it sends a file with master data to verify the accuracy of the account data. A company sends this file to the paying bank or, in many cases, a clearing house that will perform the actual validation and later the debits and credits. In the system, this process of validation is called prenotification. The following prenotification functions are available: creating prenotification files, postprocessing prenotification return files, display prenotification history, update processing status.
	Payment Medium Formats	You can use payment medium formats when creating the payment file to be sent to the bank.
	Withholding Tax	You can prepare the 1099 MISC withholding tax report.

3.3.7 Real Estate Management

3.3.7.1 Real Estate Management

Business Background

Real Estate Management is a comprehensive software solution with the ability to boost profitability by managing your real estate portfolio - irrespective of whether you manage corporate, commercial, or residential real estate.

Key Features

The following table explains the key features available:

Key Feature	Use
Property Portfolio	You can use this feature to create master data objects required to manage your real estate portfolio.
CAD Integration	You can integrate *SAP 3D Visual Enterprise* with real estate master data. CAD providers can use a standard interface to integrate other CAD solutions.
Contracts	You can create contract offers and contracts to map contractual relationships with your business partners. The contract type determines whether a contract is a lease-in (landlord/vendor contract) or a lease-out (tenant/customer contract) as well as whether it is for properties or non-properties. It is also possible to create contracts for services, sales, or security deposit agreements. You can manage all important data in the contract, including terms and conditions, critical dates, contract objects, business partners, service charge settlement parameters, condition adjustment rules, and the cash flow.
Critical Dates	You can use this feature to define reminder dates, on which real estate objects or contracts are checked and submitted for continued processing.
Sales-Based Leases	You can manage sales-based and consumption-based lease agreements in a contract. You are able to report sales or consumption for different product types on a periodic basis for calculating and settling sales-based rent.

Key Feature	Use
Financial Accounting Integration	Your posting-relevant flows can be posted in financial accounting. Beside periodic postings based on contract conditions, you can also make postings for processes (for example, service charge settlement and sales-based settlement), one-time postings, and accrual/deferral postings. You can manage outgoing and incoming payments for contracts, account statements (electronic bank statements and postprocessing of account statements), and dunning within financial accounting. You can use functions like cost planning, assessment, and settlement also for real estate objects.
Adjustment of Conditions	You can use this feature to automatically adjust conditions using different calculation methods: • Free adjustment (residential/commercial) • Index adjustment (adjustment based on index levels) • Adjustment based on representative list of rents (apartment) • Adjustment based on comparative apartment rent (apartment) • Adjustment based on modernization measure (renovation or modernization of real estate object) • Service charge settlement (adjustment of advance payments and flat rates) You can maintain and adjust conditions on contracts or on the following real estate objects: pooled spaces, rental spaces, and rental units.
Service Charge Settlement	You can use this feature to calculate and distribute apportionable costs for the use and maintenance of real estate (for example, heating, janitorial services, cleaning, repairs) to the tenants occupying the space, for a particular settlement period, according to a number of different parameters. The service charge settlement, or charge-back process ensures that operating costs for services are accurately determined and billed.
Third Party Management	You can manage real estate objects that are owned by others. A specialized type of third-party management is acting on behalf of a condominium owners' association (COA).
Corporate Real Estate Management	You can use this feature to optimize your internal room and space management. You can plan and execute internal moves for the occupants of rooms. You can reserve meeting rooms and spaces for short periods of time.
Land Management	This feature integrates your company's internal view with the public and legal view of land management. You can depict land registers, parcels and other public registers, link them to other master data objects, set up contracts, and run reports.
Information System	You can use reports to collect, summarize, and evaluate data all around real estate management (for example, master data, contract data, and flow data).

Key Feature	Use
Correspondence	You can create documents (in letter form, e-mail or fax) and send them to your business partners. You can either use standard correspondence or modify the correspondence to your individual needs.

3.3.7.2 Country/Region-Specific Features in Real Estate Management

Key Features

The following table explains the key features available for the countries/regions:

Country/ Region	Key Feature	Use
Austria	Rent Adjustment	Using the main rent statement, you generate an overview of income and expenses of a building for the calendar year. You can also use a rent adjustment method that allows increasing rent incrementally over a period of fifteen years.
	Condominium Association	You can use the value-added tax (VAT) calculation of the condominium owners' association (COA) to determine and post VAT from expenditures from the maintenance reserve of COA objects. You can also use it to subsequently allocate the amounts to individual condominium owners.
China	Contract Version Management	You can create a new version of a contract to keep your modifications. Those changes can be updated in the original contract via an approval process.
	Store Management	With store management, you can perform the following tasks: • Enable sales based rent percentage based on user-defined product category hierarchy. • Configure the display order of the Stores tab in a real estate contract. • Control the cost distribution of payment by vouchers and coupons. • Define and customize discount limits and conditions for customers, and the distribution cost of the discount.
Czech Republic	Property Tax	You can calculate property tax (building tax and land tax) and generate a tax return.

Country/ Region	Key Feature	Use
France	Budgeting & Assessment Adjustment	You can prepare the annual budget for the budgetary periods on a settlement unit level. Budgetary periods are configured for the combination of company code and settlement variant.
	Urban Solidarity and Renewal (SRU)	You can post and settle the amounts that relate to extraordinary operations: • You can set and monitor the actual status of the extraordinary operation in the corresponding settlement unit. • You can transfer all the spent and posted amounts from a provision account to a profit and loss account. This function is called transfer posting. • At the end of the fiscal year, you can run year-end posting as part of the service charge settlement process.
Hungary	Invoicing	You can include the fulfillment date on real estate invoices. The fulfillment date of financial documents created with periodic postings and service charge settlement depends on the continuity of the service of your individual real estate contract conditions. When you make a correction to a previous invoice or you reverse it, you can create a correction invoice or a reversal invoice depending on the type of your change.
India	Tax Deducted at Source (TDS)	You can report Tax Deducted at Source (TDS) on real estate.
	Goods and Services Tax (GST)	You can calculate and report goods and services tax (GST) for those buildings or properties that are leased out for commercial purposes.
Israel	Annexing	Enables annexing calculation for rental contract, general contract, and contract offer. The calculation of the annexed values is performed during the contract adjustment. There is a process that enables you to see annexing values in the contract details.
Italy	Tax	You can calculate and report for following tax types: • Property tax (IMU) You can calculate, post, and report property for your real estate. • Registration tax (IRE) You can calculate and store registration tax on the creation, renewal, or notice of a real estate contract. • Communal service tax (TASI) You, as a real estate owner can calculate the service tax for common services, for example, street lighting, or road maintenance works. • Stamp tax (IB) You can calculate stamp tax and assign the tax to documents that are subject to stamp tax, but not to VAT.

Country/ Region	Key Feature	Use
Japan	Service Charge Settlement	You can calculate and distribute the service charges based on fixed unit prices.
	Payment Charges	You can calculate and report the real estate payment charges in Japan, for example, for rents, security deposits, reikins (remuneration at the contract start), premium charges, renewal charges, and so on
	Lease-Out Offices in Mega-Cities	You can report the status and changes in the lease-out conditions of offices.
Netherlands	Rent Adjustment	You can calculate annual rend adjustment and also adjustment of conditions for contracts and rental objects.
	Social Housing	You can calculate subsidizable rent for contracts. The subsidizable rent covers the basic rent and certain service charges added to it.
Portugal	Property Tax	You can calculate and process municipal property tax (IMI) for your cadastral entries. You can also calculate the one-time stamp tax amount for the acquisition and lease contracts.
	Digital Signature	You can digitally sign the invoices you create.
	Audit File	You can include invoices that are created in Real Estate into the Standard Audit File for Tax Purposes (SAFT-PT) file.
	Rent Adjustment	You can adjust the rent according to New Urban Lease Act (NULA) that stipulates the process of gradual increase of low rents to the market prices over a predefined number of years.
Slovakia	Property Tax	You can simulate property tax calculation and prepare and submit a declaration that contains all the data about your property.
Spain	Security Deposit	You can generate and submit a balance report on a regular basis about all activities (for example, posting, payments) relating to security deposits to the payment of security deposits to the corresponding autonomous community.
	Property Tax	You can process property tax for your cadastral entries and to make the annual tax payments as required in Spain.
	Statutory Reporting	You can create the Modelo 347 return to report all your business activities with all business partners (vendors and customers).
	Withholding Tax	You can prepare withholding tax returns (Modelo 180) for fiscal periods.
	Invoices	When you make a correction to a previous invoice or you reverse it, you can create a correction invoice or a reversal invoice depending on the type of your change.

Country/ Region	Key Feature	Use
Switzerland	Fuel Consumption	For service charge settlement, fuel costs are settled based on the effective consumption of fuel.
	ISR Payment Procedure	You can assign ISR reference to cash flow items that can be posted as vendor invoices during the lease-in periodic posting.

	Rent Adjustment	You can use the following adjustment methods:
		• Adjustment based on relative or absolute factors
		• Adjustment based on other adjustment methods:
		  ○ Adjustment based on modernization (adjustment measure)
		  ○ Adjustment based on index-linked rent
		  ○ Adjustment by entering graduated conditions
		  ○ Adjustment using combined methods
		The rent adjustments and the reserve are calculated in the same way as the general rent adjustment method.

3.4 Manufacturing

3.4.1 Production Planning

3.4.1.1 Production Planning and Detailed Scheduling

Business Background

You use Production Planning and Detailed Scheduling (PP/DS) for SAP S/4HANA as a production planner to create finite production plans taking into account resource schedule, component availability and order dates/ times in detail. Typically, you use PP/DS to plan your critical products and bottleneck resources.

Key Features

The following table explains the key features available:

Key Feature	Use
Create proposals for in-house production or external procurement to cover product requirements	You can create proposals for both internal production and external procurement with dates and times across multiple plants to cover material shortages. You can create production plans either with automated production planning run using heuristics or with manual intervention.
Optimize plan and sequence the resource schedule and the order dates/times	You can adopt a finite plan taking resource availability and capacity into account. With a finite plan, hard constraints modeled in the system are taken into consideration. You can automate the optimization of the plan according to certain criteria, such as setup times and setup costs, to achieve a finite plan or to improve the planning situation. You can sequence planned orders on production lines for individual lines or for a complete line network. Your order sequence takes required dates and restrictions into account with minimal possible violations. You can enable continuous production, particularly in process industry by adjusting the duration of production without changing the order quantity. You can sequence production operations running on a defined production resource taking resource availability and capacity into account. Sequencing of orders producing materials being relevant for demand-driven replenishment can be done using calculated priority based on projected on hand status. Orders of products not being relevant for Demand-Driven Replenishment [page 67] can be sequenced based on priority which is calculated using remaining time buffer.
Create proposal based on simulative planning parameters	You can create proposals for both internal production and external procurement with dates and time based on simulative planning parameters, without affecting operative planning.
Planning with Characteristics	You can use planning with characteristics where receipts are consumed with requirements, based on matching characteristic values. You can plan or pre-assign resource capacities for products with specific attributes, with the purpose of using the capacities more rationally.
Execute and monitor production at defined reporting points	You can enter and monitor production confirmation (backflushing) for planned orders with defined reporting points.

Key Feature	Use
Create a supply plan using a cost-based optimization technique	You can create supply plans to ensure the availability of materials for a defined part of your manufacturing or supply chain network. The production planning tool supports multi-level planning, using a time bucket-based planning method. It considers constraints such as production capacity, lead time, material flow and maximum delay allowed in fulfilling a demand. You can generate an optimized supply plan in the form of planned orders and purchase requisitions by weighing different costs and penalties (for example- for production, stock transfer, external procurement, storage) against each other.
Side-by-side deployment	With the SAP S/4HANA Manufacturing for planning and scheduling capability of SAP Digital Supply Chain Management, edition for SAP S/4HANA, you can deploy an SAP S/4HANA system in which you use the advanced planning features of Production Planning and Detailed Scheduling (PP/DS) side-by-side with one or more SAP S/4HANA or SAP ERP systems with harmonized master data that you use for other ERP components. The SAP S/4HANA system that you use for PP/DS is connected to the ERP systems via Core Interface (CIF). Master data is integrated from the ERP systems to the PP/DS system, transactional data is exchanged bidirectionally. The integration is controlled via integration models that are created and activated in the ERP systems.
Integration with SAP IBP order-based planning	You can use the production planning integration feature of SAP Integrated Business Planning for Supply Chain (SAP IBP) to combine the operational supply planning features of SAP IBP order-based planning (OBP) with the detailed planning and scheduling features of PP/DS. The integration of orders is controlled by the production planning integration mode (PPIM) that is assigned to a location material.

3.4.2 Manufacturing for Production Engineering and Operations (PEO)

3.4.2.1 Extended Production Engineering

3.4.2.1.1 Bill of Material Management

Business Background

During the product engineering phase you, as product engineer, design new products or product lines to take advantage of current process technology and to improve quality and reliability, for example. The result of this phase is the engineering bill of material (EBOM).

Subsequently, in the production engineering phase you, as production engineer, may have to regroup components into manufacturing bills of material (MBOM) for better manufacturability.

Key Features

The following table explains the key features available:

Key Feature	Use
Create version-controlled bills of material	With version-controlled bills of material, you can ensure that consistent bills of material are used in production execution. Each bill of material version has its own release status, whereby only a released version can be used in production. If you need to change a bill of material after it has been released, you have to create a new version.
Create bills of material for configurable materials	You can create bills of material for configurable products or materials.
Specify unitized parameter effectivity	You can create super bills of material using product unitization, whereby you can specify the effectivity for the attributes of the bill of material. As a result, when you produce a particular unit, the super bill of material is filtered to retrieve the information relevant for the unit that is assigned to the production order. In addition, you may often redesign existing products and your changes may only be valid for a certain range of end-item units. For every bill of material item, you can specify the range of end-item units that need the component. Product unitization is built on the parameter effectivity function to make use of certain semantic patterns and rules to ensure: • Accurate incorporation of engineering bills of material into manufacturing bills of material. • A meaningful match between the bill of material components and the routing operation activities.

Key Feature	Use
Specify the physical location of visual component instances in manufacturing bills of material	In the Visual Enterprise Manufacturing Planner (VEMP), you can add reference designators to visual component instances in the manufacturing bill of material to indicate where components with multiple instances are to be assembled. If already defined in the engineering bill of material, reference designator information is inherited by the manufacturing bill of material.
Plan assembly and disassembly of dummy parts	You can plan the assembly and disassembly of dummy parts or fixtures within the same order or across orders. When creating the manufacturing bill of material in the Visual Enterprise Manufacturing Planner (VEMP), you can add non-visual components with a positive (+) or negative (-) quantity, whereby the negative quantity in the manufacturing bill of material is treated by SAP S/4HANA Manufacturing for production engineering and operations (PEO) as a by-product. Alternatively, you can add a component with negative (-) quantity when creating a bill of material directly.
Create a disassembly bill of material	You can create a disassembly bill of material for serialized products to disassemble a finished product with the aim of recovering parts that can be reused. You have the following options for creating the disassembly bill of material: • You can use a manufacturing bill of material as the source bill of material and create a disassembly bill of material containing the same components as in the source bill of material. • You can create a disassembly template bill of material in the Visual Enterprise Manufacturing Planner in which you only include the components that you want to disassemble and reuse. Then you can convert this disassembly template bill of material into a manufacturing bill of material for disassembly. In both cases, during the creation of the disassembly bill of material, the system: • Creates a new header material. • Adds the original header material of the source bill of material to the disassembly bill of material with a positive quantity. • Reverts the positive quantities of all the other components to negative quantities to be disassembled.

3.4.2.1.2 Manufacturing Reference Structures (MRS)

Business Background

A manufacturing reference structure (MRS) is a separate hierarchy of information that can be linked to the BOM hierarchy to provide additional contextual information for BOM components during production processes.

An MRS hierarchy can be defined based on a spatial, functional, or system hierarchy and it doesn't have to match the BOM hierarchy. The link between MRS hierarchy and BOM hierarchy can provide additional context

during production processes. For example, it can help you to identify parts of a complex product in the context of the end item, particularly if these parts are spread across a vast area.

Key Features

The following table explains the key features available:

Key Feature	Use
APIs	Through SAP product data management integration with SAP S/4HANA, the APIs enable you to create a manufacturing reference structure hierarchy and link it to the EBOM hierarchy.
Display manufacturing reference structures	You can display the manufacturing reference structures that have been created by the APIs.
View MRS designator	PEO tracks MRS information for components across production engineering and production order execution. If BOM components are linked to an MRS hierarchy, PEO shows the MRS designator for this component alongside other attributes of the component. You can view details of the MRS designator and to which MRS item in an MRS hierarchy the component is linked.
Enrich functional locations	You can use Business Add-Ins to create and update functional locations based on manufacturing reference structure information derived from as-built data.

3.4.2.1.3 Change Management

Business Background

To manage engineering changes in SAP S/4HANA Manufacturing for production engineering and operations (PEO), you use the existing Engineering Change Management (ECM) functions of SAP S/4HANA combined with features offered by PEO.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage new or changed engineering bill of material versions	You determine the correct area of responsibility for new or changed engineering bills of material so that they can be grouped in the right manufacturing change record for initiating the manufacturing handover process. You can search for engineering bills of material in different states and do the following: • If available, determine the relevant change records and planning scope for the engineering bills of material and assign them to a change record. • Navigate to the change record for further processing for the engineering bills of material that are already assigned to a change record. • Create a change record and assign the planning scope and engineering bill of material to it. • Create a planning scope for a new engineering bill of material and link the engineering bill of material to it. • Automatically propose similar engineering bills of material and assign all of them to the same change record.
Manage new or changed manufacturing bill of material versions	You can search for new or changed manufacturing bills of material and assign them to a change record. You can also search for manufacturing bills of material that are already assigned to a change record and navigate to the change record for further processing. You can create a change record and assign the manufacturing bills of material to it.
Prepare manufacturing bill of material creation based on an engineering snapshot	When manufacturing a material in a specific plant for the first time, you can prepare the manufacturing bill of material creation based on an engineering snapshot, which contains the engineering bills of material of the main assembly and any subassemblies, the 3D visual, and auxiliary data. The change record is then created or updated with the relevant engineering bills of material, the engineering snapshot, and the planning scope. A prerequisite is SAP product data management integration to SAP S/4HANA, which facilitates creation of engineering snapshots based on the engineering packages from your external PLM system.
Monitor engineering snapshots	You can monitor engineering snapshots to determine whether any issues occurred during preparation of the auxiliary data or change record for new engineering bills of material.

Key Feature	Use
Analyze change impact	The change impact analysis helps you to find different manufacturing-related objects that may be affected by a change to an existing object such as an engineering bill of material, manufacturing bill of material, or routing. After the related objects are determined, you can take some quick action such as putting the production order on hold. You can also add the object to the change record to take action on them later in the context of the change cycle. When working with a unitized bill of material and shop floor routing, you can see the effectivity impacted by the change. If you work with engineering snapshots and a snapshot contains product manufacturing information (PMI) data, you can determine PMI changes in the change impact analysis.
Compare bill of material changes	You can compare two bills of material for the purpose of reporting the bill of material change in part content. The bill of material change usually compares two revisions of the engineering bill of material for a part but may also be used to compare engineering bills of material for two different parts. It allows you to: • Compare two versions of the engineering bill of material for the net change analysis. • Identify whether an object has been impacted by the change. • Identify the components that have been impacted by the change.

3.4.2.1.4 Shop Floor Routing Management

Business Background

During the production engineering phase, you design and continuously improve manufacturing equipment, production facilities, and manufacturing procedures. This process enables you to model a detailed execution plan including required quality steps.

Key Features

The following table explains the key features available for managing shop floor routings in SAP S/4HANA Manufacturing for production engineering and operations (PEO):

Key Feature	Use
Manage version-controlled routings	You can create multiple routing versions for a routing group and counter. Each routing version has its own release status. Released routing versions can be used in production execution and can therefore no longer be changed. If you want to make changes to a routing version, you have to create a new routing version. You can copy a released version and make the necessary changes. The new routing version cannot be used in production execution while in process. This procedure guarantees consistency in production execution. You define the validity period for the routing version in the production version.
Create and release shop floor routings without manufacturing bill of material (MBOM) assignment	You can create a shop floor routing version and assign a material only without assigning an MBOM. If this material is enabled for parameter effectivity (unitized product), you can maintain effectivity range information at operation and operation activity level.
Create operation activities	You can create operation activities which you use to model the steps to be performed in production in greater detail. You assign each operation activity a status and action schema (SAS) that defines the statuses and possible transitions that are allowed for the operation activity. You can use any-order groups to define sets of operation activities that can be completed in any sequence or simultaneous groups which allow the parallel processing of operation activities in production execution.
Enable flexible processing	You can activate flexible processing mode when creating a routing to eliminate dependencies between operations during production execution in the following way: • In serialized execution, no consistency checks on operation sequence are performed. This means operators can process operations in any sequence and work on operations in parallel. • In non-serialized execution, no cross-operation quantity and status checks are performed. This means operators can process operations in any order and post any quantities. In addition, you can define relationships between operation activities in different operations.
Enable execution in SAP Manufacturing Execution (SAP ME)	For non-configurable and non-unitized products, you can enable integration with SAP ME if the execution tasks for a shop floor routing are to be performed in SAP ME and not in the execution apps available in Manufacturing for production engineering and operations.

Key Feature	Use
Create and manage workflow	You may have a team of several production engineers working on one shop floor routing version simultaneously. This work has to be carefully coordinated to ensure that all tasks are completed. You can manage such coordination tasks using the workflow features. If necessary, you can change a workflow that has already started and define that several steps can be processed in parallel.
Model a detailed production process	A shop floor routing provides a very detailed description of the operations and operation activities that have to be carried out and the order in which they have to be carried out to produce a material. In addition, the routing contains details about the work centers at which the operations and operation activities are processed and the manufacturing bill of material components that are required. You can model the process in detail in the various routing workspaces.
Model a detailed production process for unitized products	The effectivity information is derived from the assigned manufacturing bill of material (MBOM) and passed on to the routing header. The operations inherit the effectivity information from the routing header and the operation activities inherit the effectivity information from the operations. You can change the effectivity for operations and operation activities, as necessary. You can also change the effectivity information at routing header level meaning that you can create a routing version for a subset of the effectivity range defined in the MBOM. In addition, the MBOM assigned to the routing version may have an open effectivity range or an undefined effectivity parameter (wildcard *). That is, no upper limit has been defined.
Model a detailed production process for configurable materials	You can create shop floor routings for configurable products or materials. Often operation activities are only needed for a certain configuration of the final product. Shop floor routing management allows you to define if and how an operation activity depends on configurable components.
Create and manage reference templates for shop floor routings	You can create and manage reference templates (operation sets, operations, operation activity groups, and operation activities) that you can insert into shop floor routings, rework routings, and order-specific shop floor routings. Reference templates are version based for which a complete lifecycle management is enabled. Releasing a version enables its use in routings. If you need to make changes to a released reference template, you first have to create a new version, make your changes, and release the new version. Where-used information is available to find and upgrade all routings that are affected by a new version quickly and efficiently. You can find the released reference templates in the template library, in the shared templates folders. You can assign classification data to reference templates to enable sophisticated search possibilities.

Key Feature	Use
Create and manage shared copy templates	The shared templates folder in the template library also contains shared copy templates that are available to all users. Shared copy templates have no lifecycle management and are not version based. You can assign classification data to the shared copy templates of the types operation, operation activity group, and operation activity to enable sophisticated search possibilities.
Create and manage private copy templates	If you have objects that you reuse regularly such as operations, PRTs, inspection characteristics, or documents, you can copy them to your private copy templates folder in the template library. You can also set links to reference templates and shared copy templates in your private folders. You can access your private copy templates in all routings and reuse these objects as often as necessary.
Set an effectivity filter	You can define an effectivity filter to create a separate work environment for a limited effective range. You can change the operations, operation activities, and components for this work environment without these changes having an effect on the rest of the routing.
Assign a change record to the routing	You can assign one or more manufacturing change records to the shop floor routing and rework routing. Depending on the settings defined in the version profile, it may only be possible to release a routing if a change record assignment exists.
Assign operations to an external service provider	You can specify that selected operations are to be performed by an external service provider.
Set a change alert count	You can enter a change alert count for each operation activity when maintaining the routing version. A change alert notifies the operator in production about engineering changes and highlights such changes. By setting a counter in the operation activity, you can stipulate that the receipt of this change information has to be acknowledged once or several times. This ensures that engineering changes are visible and correctly implemented.

Key Feature	Use
Create work instructions for operation activities (also using standard texts)	You can create detailed work instructions for operation activities that are made available to the production operator on the shop floor before starting the activity. For example, you can: • Create or reuse standard texts and images. That is, you can reference or copy existing standard texts or images into work instructions thus reducing the effort involved in creating and maintaining work instructions. • Create work instructions with interactive data collection so that production operators on the shop floor can follow complex instructions and record data within the context of the instruction. • Create 3D views showing specific angles or areas of the 3D visual if the MBOM assigned to the shop floor routing has instances and if a 3D model is available. You can also link the new 3D views to the work instructions. • Incorporate reference designators as a reference into standard and interactive work instructions.
Assign components to operation activities	You can assign components to the operation activities for which they are required. You can also split MBOM item quantities and assign partial quantities to different operation activities of an operation. The assignment to operations is then done implicitly by the system and this information is displayed accordingly. The assignment at operation activity level is relevant for execution. When working with component instances, you can take account of reference designator information when assigning component instances to operation activities. In a disassembly scenario, you can assign components with a negative quantity (by-products) to operation activities.
Define assembly sequence for components	You can determine the order in which components are to be assembled in production execution.
Assign inspection characteristics to operation activities	You can: • Assign inspection characteristics or tables of inspection characteristics to operation activities which describe the inspection criteria. • Assign reference master inspection characteristics for which statistical process control (SPC) is enabled. • Specify a component for which the inspection characteristic or table of inspection characteristics is to be performed. If no component is specified in the inspection characteristic, the data is collected for the header material. • Define that a quality notification is to be created automatically should the inspection results not conform to predefined measurements.
Assign production resources/tools (PRTs) and documents to operation activities	You can assign PRTs and documents to operation activities and define whether the use of a tool is to be registered in execution. This information is made available to the production operator on the shop floor before starting the activity.

Key Feature	Use
Assign required qualifications to operation activities	You can assign required qualifications to operation activities. You can use qualifications to ensure that only qualified production operators perform critical or difficult operation activities. HR qualifications are assigned to the production operators and the system checks that the qualification requirements are fulfilled when the operator starts the operation activity.
Assign buyoff cycles to operation activities	You can assign buyoff cycles to operation activities. A buyoff is a confirmation that an operation activity was performed as defined in the routing. When maintaining the operation activity, you can create a new buyoff sequence or you can assign a predefined buyoff cycle template. A buyoff cycle template defines all the required experts who have to check the quality of an operation activity. If a buyoff cycle template has been assigned to an operation activity, this activity cannot be completed in production execution until all buyoffs have been fulfilled.
Assign auxiliary data to routing objects	If certain prerequisites are fulfilled, you can assign product manufacturing information (PMI) data to routing objects such as inspection characteristics, PRTs, or work instructions, for example. If a new version of the auxiliary data file is available, you can compare the current version with the new version and incorporate the changes.
Manage action handlers for operation activities	You can display available action handlers and their parameters and parameter values. You can also add further action handlers specifically for a particular routing.
Extended message log	You can check the routing consistency using an extended message log. The system displays all errors and inconsistencies that you have to solve to release the routing. You can click each error to navigate to the error source where you can fix the problem.
Compare routing versions	You can use the comparison mode to see the differences between two routing versions. This means that you can easily manage all the changes that have been made from version to version and use this past information to update the current version as necessary. For example, you can compare different versions of one shop floor routing, or of a master shop floor routing version and an order-specific routing version. Options are also available for comparing unitized parameter effectivity. In the comparison mode, you can continue to work on the routing structure. Most of the functions available in non-comparison mode are also available in comparison mode. In addition, you can perform the release check, release the routing version, and create the production version from the comparison mode.
Create rework routings	You can create a rework routing, which is required in execution if a defect is recorded in production for which a rework task is created. You can add as many rework operations as needed and a number of operation activities for rework. There can be multiple rework routings per plant, and each rework routing can be linked to a particular defect.

Key Feature	Use
Track changes using the change history	You can view a table of all the changes that were done to all types of routings and reference templates. The change history is available during maintenance as well as after release for reference purposes.
Maintain production versions	The production version determines the production techniques according to which a material is to be manufactured. A material may have several manufacturing bills of material (MBOMs) and several routings used for its production. You define which MBOM and which routing combination is to be used for which validity period in the production version. It is possible to use different master data for planning and execution purposes. You can create and release a production version for a shop floor routing that only has a material assigned to it (no MBOM assignment).

3.4.2.1.5 Production Engineering and Planning

Business Background

The production engineering and planning process is crucial to manufacturers operating in a competitive environment. SAP S/4HANA Manufacturing for production engineering and operations (PEO) supports a range of process variants, which form the basis for the production engineering and planning process through to production execution. This gives you the flexibility to adopt a production engineering and planning approach that best suits your requirements.

Key Features

The following table explains the key features available:

Key Feature	Use
Create planning bills of material	You can create a planning bill of material for planning purposes before completion of the final shop floor master data. This enables you to produce or procure materials with long lead times, for example.
Create planning routings	You can create simplified planning routings that are used with the planning bill of material for planning purposes before completion of the final shop floor master data. This enables you to produce materials with long lead times. You can also assign known bottleneck work centers to operations so that work center capacity can be planned well in advance. Planning routings can be date effective or parameter effective. Planning routings can be assigned to a change record and they support phantom assemblies.

Key Feature	Use
Check readiness of shop floor master data for production	You can easily check for issues with shop floor master data that prevent the planned order from being converted to a production order. Several options are available for resolving these issues.

3.4.2.2 Extended Production Operations

3.4.2.2.1 Production Control

Business Background

This process enables you to manage and regulate the manufacturing process using the features available in SAP S/4HANA Manufacturing for production engineering and operations (PEO). It is typically performed by the production supervisor who monitors production progress and reacts to issues such as missing components, delays, holds, or quality issues.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage work load for production operators	You can view detailed information on your production operators and manage their work load.
Read production order master data	You can update the production order with the latest version of the bill of materials and shop floor routing before releasing it.
Change dates and quantities for a production order	You can change basic dates and quantities for a production order.
Release production orders/operations	You can trigger the production process by releasing the production order or its operations.
Put objects on hold and release them again	You can temporarily block production by placing orders, materials, operations, or work centers on hold. When placing the object on hold, you can specify a reason code and note. Once the issue has been solved, you can release the hold. You have the tools you need to monitor all objects that are currently on hold as well as holds that have been released.

Key Feature	Use
Reprocess materials movements	You can view failed material movements to determine why they failed. To help you fix issues, you can use mass update functions to replace missing or incorrect values, or you can use navigation options to branch to the material and make changes, for example. You can then reprocess the material movement.
Incorporate order changes	You can effectively incorporate order changes at any time during the manufacturing process, that is, even when orders are already in process. By creating an order-specific routing, you can handle issues more effectively by making ad hoc changes to a specific order without changing the master routing and manufacturing bill of materials.
Trigger disassembly due to an engineering change	You can trigger a disassembly scenario to incorporate engineering changes that require the disassembly of components. That is, a new manufacturing bill of material (MBOM) version exists that you want to use for a production order that is currently in execution. To make the changes, you create an order-specific shop floor routing where you can, for example: • Compare the old and new MBOM versions in a dedicated comparison screen. • Permanently disassemble components to be replaced and define a stock type and storage location where the disassembled component is to be placed. • Temporarily disassemble and reassemble components that have to be removed to disassemble another component. The production order is updated when you save and release the order-specific routing.
Trigger disassembly due to rework	You can trigger a disassembly scenario to handle rework that requires the disassembly of components. In this case, a production operator records a defect for which you create a follow-up action to change the order. When you save the follow-up action, the system puts the order on hold and creates an order-specific shop floor routing where you can, for example: • Add new or modify existing operations and operation activities if they are editable. • Create, change, or delete components if they are editable. • Disassemble components whereby disassembly may be permanent or temporary. • Define a stock type and storage location where a component is to be placed after permanent disassembly. The production order is updated when you save and release the order-specific routing.

Key Feature	Use
Split orders	You can split a shop floor order into two separate orders with the same material if you need to handle the processed partial quantity separately from the remaining quantity to be produced. An order split is allowed at operation level, which means the serial numbers (for a serialized product) or partial order quantity (for a non-serialized product) must have completed all operation activities in the current operation and be in queue at the operation from which you want to split the order.
Monitor production order progress	You have up-to-date information regarding the processing status of all orders focusing on exception situations.
Monitor production operation progress	You have up-to-date information regarding the processing status of all operations focusing on exception situations. You can also navigate to the operation activity view of the operations. In addition you can distribute the work load by assigning production operators to the operation activities.
Monitor and track production	You have reports that document how the product was manufactured. For example, you can: • Check which components were assembled. • Check which components were disassembled or returned and to which stock type and storage location. • View data that was collected and issues that were logged. • Monitor every action performed for a production order, including actions performed by production operators at operation and operation activity level. • Check which materials have been consumed in assemblies and subassemblies for a specific production order or serialized material. You can also make corrections to as-built information to resolve inconsistencies. • View reference designator information (if available).
Track tool usage	You can track the availability, status, and location of production tools (equipment), whereby you can claim equipment for a specific user, work center, or multiple operation activities. You can also view a detailed claim and registration history for equipment.

3.4.2.2.2 Production Execution

Business Background

This capability enables you to make all the necessary preparations required for production. It provides support with the actual production process and also enables you to document production progress. It is typically performed by the production operator.

Key Features

The following table explains the key features available:

Key Feature	Use
Assign work	As a production supervisor, you can assign production operators or teams to operation activities. You can also change the execution priority of operation activities assigned to an operator.
Display queue per work center	As a production operator, you have access to all operations assigned to your work centers. This information is split into operations that are in progress, not yet started, or finished. You can see the progress of the production operations as well as the current issues - whether an operation is on hold, delayed, or has component issues. Based on this information, you can decide which operation you need to work on next.
View work	As a production operator, you can view and select the work that you have been assigned by the production supervisor, whereby operation activities with a defined execution priority are listed accordingly. You can also print the operation activities.
Check execution feasibility	You can check whether you can start a new operation activity. For example, the predecessor activity must be completed before the current activity can be started or the work center, material, or production order must not be on hold. You can use action handlers to implement additional checks.
View detailed work instructions	While processing an operation activity, you are provided with detailed work instructions. You can use a 3D image that interacts with the component list to identify required parts and where they should be assembled. If available, you can interact with reference designators to highlight a particular instance in the 3D visual. If created in the work instructions, you can also display 3D views showing specific angles or areas of the 3D visual.
Acknowledge change alerts	You are informed about engineering changes by change alerts. You have to read and acknowledge such changes before you can start the operation activity.
View detailed information	You have access to all the information that you need to execute the operation activity before you start work. This information also includes the necessary components, PRTs, qualifications, or inspection characteristics. The information is maintained in the routing and made available when processing an operation activity.

Key Feature	Use
Process operation activities	You can use actions such as start, pause, skip, scrap, or complete to record the processing path through production. The system only provides actions that are allowed for the current status. The actions available for each status are determined by the status and action schema (SAS) that is assigned to the operation activity in the routing. During production execution, you can: • Specify a reason code or note for an action. • Put different objects such as order, material, operation activity, or serialized product on hold. • Use labor tracking to allow several operators to work in parallel on the same activity. • Add any type of attachment to the production record. • Perform and record assembly, disassembly, and reassembly of serialized and non-serialized components and record reference designators (if available) for component instances. • View a list of components to be disassembled (temporarily or permanently) and view previously assembled components. • Select the stock type and storage location to which the disassembled component is to be returned (unless predefined in the order-specific routing). • Register equipment that you use to perform your work.
Process operation activities retroactively	You can select an operation activity and set it to retroactive processing. The system changes the status of this activity to in process indicating that it is being worked on, but that the confirmations will be posted later.
Record yield and scrap for an activity if material is not serialized	You can record the yield and scrap quantities for an operation activity for components that do not have a serial or a batch number. You can also record the consumed quantities for components for which the backflush indicator is not set. This information is used for traceability purposes and is used in reports that monitor and track production.
Record completion for serialized materials	You can record the completion of a single material item at an operation activity.
Record scrap for serialized materials	You can record scrap for a single material item at an operation activity. You can enter a reason code and a note when scrapping if enabled in configuration.
Record a defect	You can record a defect for a damaged serialized or non-serialized material, and if necessary place the material on hold. You can also record a defect for a specific component that is assigned to the operation activity currently in process. The defect is displayed on the corresponding tab. Once the defect decision has been made, this information is also displayed here.
Trigger a situation for production defects	You can use a situation template to inform users that a production order is affected by a defect. A notification is triggered when a production defect is created or completed.

Key Feature	Use
Create a quality notification	You can: • Instruct the system to create a nonconformance defect first, which you subsequently convert into a quality notification. • Instruct the system to convert nonconformance defects into quality notifications automatically. • Instruct the system to create a quality notification at data collection should the inspection result not conform to the predefined measurements.
Process rework operation	The defect decision may be to perform a rework task, for example. In this case, a quality engineer can select the required rework routing and choose where to insert the rework operation in the current production order. When processing the rework activity, you can refer to an as-built view that lists all the components that have already been assembled. If necessary, you can disassemble components or add unplanned materials.
Record inspection characteristic values	You can enter values for inspection characteristics. The system also provides information on the minimum and maximum values allowed for an inspection characteristic. You can add unplanned inspection characteristics while performing an operation activity in production. To help you valuate the inspection result, you can display a control chart for those inspection characteristics that reference a master inspection characteristic for which statistical process control (SPC) is enabled.
Record serial numbers and batch numbers of components	You can record the serial or batch number of consumed components. If available, you can also record the manufacturer's serial number and supplier batch information. This information is used for traceability purposes and is available in reports that monitor and track production.
Perform buyoff	You can acknowledge that an operation activity has been processed correctly. If a buyoff cycle has been assigned to an operation activity, this activity cannot be completed until all buyoffs have been fulfilled.
Add unplanned materials	You can assemble a material that was not originally planned for assembly.

3.4.2.3 Major Assembly Production

Business Background

The challenges faced by enterprises in manufacturing complex technical products such as aircraft, ships, and power stations are significant. They include assembling thousands if not millions of components, managing and planning production processes over a long period of time, and performing operations on different parts of a product simultaneously and in a feasible sequence.

SAP S/4HANA Manufacturing for production engineering and operations (PEO) considers all of these factors in complex assembly, which are difficult to realize in classic production processes, and provides effective and flexible tools for you to plan, manage, and execute your complex assembly processes. Assembly is broken down into manageable pieces and engineering changes can be incorporated even if the assembly process has already started.

Key Features

The following table explains the key features available:

Key Feature	Use
Use project management to represent your manufacturing processes	You can: • Use projects or production orders to define your manufacturing process. • Cost projects at a different level to the finished product, for example, by major assembly or groups of major assemblies. • Define deadlines as part of a project rather than the production order. • Create a project structure automatically based on the manufacturing BOM hierarchy. • Update the project structure automatically whenever changes are made to the BOM hierarchy. • Assign an existing project to a bill of material for an end item.
Model complex manufacturing processes using end items, major assemblies, and installation kits (major assembly production)	You can: • Define special material types that allow you to distinguish between end items, major assemblies, and installation kits. • Configure the unitized parameter effectivity to increase the flexibility of your production. • Create special installation orders that represent the assembly of groups of components. • Create and post inventory for your installation kits, as well as define whether created inventory has to be manually checked before posting or whether this process occurs automatically.

Key Feature	Use
Perform iterative maintenance of major assembly BOMs and networks	You can check your major assembly projects for a range of different issues and fix any inconsistencies detected. This helps you to ensure that your projects address all required activities, are always up to date with engineering changes, and allow proper planning of components – even if parts of the project are already in process.

3.4.2.4 Integration Scenarios

Business Background

SAP Manufacturing for production engineering and operations (PEO) offers a range of integration options, which allows you to work with other SAP products in your current solution landscape. This means you can continue to use your established solution and also benefit from the features provided by PEO.

Key Features

The following table explains the key features available:

Key Feature	Use
Integration with SAP Manufacturing Execution	You can integrate your SAP Manufacturing Execution (SAP ME) system with PEO to utilize the benefits of each solution. For example, use the production planning and change management features of PEO, while still executing your orders in SAP ME. Both PEO and SAP ME use version-managed bills of materials and routings, which simplifies the integration and facilitates alignment of data models.
Integration with an ERP system	You can run PEO side by side an ERP system (ECC or SAP S/4HANA). In this integration scenario, you use PEO to perform production engineering and operations, while performing all other processes in the ERP system. **i Note** Constraints apply in contrast to using PEO as an integral part of the full SAP S/4HANA solution.

Key Feature	Use
Integration with smart tools and machines	PEO provides function modules for data exchange that you can use to trigger communication from equipment (smart tools or machines) to PEO. You can then connect this equipment to Plant Connectivity (PCo), optionally via SAP MII. **i Note** PEO does not provide the implementation out of the box. You need to decide how you want to trigger the PEO actions and configure this accordingly.
Integration with SAP Advanced Planning	You can use the Advanced Planning functions to perform material requirements planning (MRP) by generating a production data structure (PDS) from the PEO master data for non-unitized products. This involves converting the PEO production version containing a version bill of material and shop floor routing into a PDS, which is a prerequisite for MRP in Advanced Planning.

3.4.3 Environment, Health and Safety

3.4.3.1 Incident Management

Business Background

You use the incident management solution to record and process incidents, safety observations, and near misses. This solution provides methods for recording the data to accommodate online and offline situations. After initially recording an incident, you can collect additional information from the people involved, investigate why an incident occurred, track the financial impact on the organization and its assets, and define corrective and preventive tasks. You can report data externally or internally to fulfill legal or company-specific reporting requirements, respectively. In addition, you can manage injury/illness log entries and perform comprehensive analyses of incidents, injuries and illnesses, and injury/illness log entries.

Key Features

The following scenarios and key features are supported:

Managing Incidents

You can record incidents that occur in your organization and report them to the relevant authorities. You can also investigate the causes that led to an incident, and initiate actions to prevent unsafe conditions and future incidents.

To manage incidents, you can use the following features:

Key Features	Use
Initial Recording of Incidents	You can record basic information about an incident, including a description of the events as well as information about the people and assets that were involved in the incident. When the initial incident recording process is completed, the system automatically notifies the processor responsible to trigger follow-up activities. You can summarize the initially recorded data in a print form. This document is assigned to the incident record and you can use it as a reference during the review and completion step.
Reviewing and Completing Incident Records	You can directly access incident records to review and complete the information that was entered when the event was initially recorded. If you require additional information from others, you can start a process that sends out inquiry forms and automatically notifies you when these forms have been completed. You can review the forms before automatically transferring the form entries into the fields of the incident record. Depending on the regulations that are valid for your organization, you can generate reports that can be sent to the relevant authorities.
Investigating Incidents	You can carry out an incident investigation to determine the causes that led to an incident. Depending on legal or organization-specific requirements, you can configure different investigation templates to include relevant investigation steps, such as a step for a root cause analysis and a step for lessons learned.

Managing Injury/Illness Log Entries

You can enter and manage different kinds of medical assistance provided to employees at your company, such as first aid and the treatment of minor injuries, as well as the treatment of pre-existing injuries and aid given to employees who are not feeling well.

To manage injury/illness log entries, you can use the following features:

Key Features	Use
Creating and Editing Injury/Illness Log Entries	You can record and edit information about events that involve medical assistance. An injury/illness log entry can contain information such as the injured person and persons involved, first aid and follow-up treatment, event location and time of event, injuries, and treatment location.
Reporting an Incident Based on an Injury/Illness Log Entry	You can create an incident related to an existing injury/illness log entry and transfer the available data from the injury/illness log entry to the newly created incident.
Creating a Medical Service Based on an Injury/Illness Log Entry	You can create a medical service for an injured person assigned to an injury/illness log entry. This feature is available if the SAP EHS Management for SAP S/4HANA, occupational health application is implemented.

Managing EHS Locations

You can create and edit locations and specify a location hierarchy. You use locations, for example, to specify a workplace when an incident occurred.

To manage EHS locations, you can use the following features:

Key Features	Use
Editing Location Structures	You can insert locations at different positions into a location structure to represent where these locations exist spatially or functionally in your company. The location structure also allows you to make mass changes to the attributes of multiple locations in one go, instead of having to maintain each location individually.
Editing Locations	You can add new locations to the location structure or edit the master data of locations that already exist within the structure. Location master data includes the plant or company code to which that location belongs, and the precise position of the location. For locations that have been created manually, you can also establish links to technical objects.
Importing Locations	If you want to reuse locations that exist as technical objects in a plant maintenance application, you can import them as locations into Environment, Health, and Safety Management. You can also import locations and location structure from third-party sources through a spreadsheet upload in the SAP S/4HANA migration cockpit.

3.4.3.2 Environment Management

Business Background

You use the environment management solution to record, collect, process, monitor, and organize environmental data to stay compliant with the applicable environmental requirements for your company. You can use manual or automatic methods to collect and calculate emission inventory data, record that data, and prepare it for export and reporting. You can manage and report deviations if they occur.

Key Features

The following scenarios and key features are supported:

Managing Emissions

You can record environment-related data from operations in your company and export the data so that it can be reported, for example, to legal authorities. You can also process data and initiate tasks and activities to prevent future deviations.

To manage environmental data, you can use the following features:

Key Features	Use
Preparing Locations and Chemical Data	You can create your own locations to specify workplaces where emissions are produced. You can organize the locations in a hierarchical structure to easily maintain and edit their data. You can make mass changes to all locations in one go. You can manage the role assignments of persons responsible across the location structure. To manage the environmental compliance of your company, you need to create and maintain chemical (product) data. The data is used in follow-up business processes to ensure that your organization is compliant with the applicable environmental requirements. For example, when you organize the compliance requirements in your company, you can create environmental limits assigned to a chemical record or you can create compliance scenario activities, such as data collections, calculations, samplings, or aggregations for a specific chemical.
Preparing Compliance Requirements	You can create structured compliance requirements to keep record of and track requirements from policies, permits, and regulations. In the compliance requirements, you can specify environmental limits, regulatory lists, and equations, which can be used later in the process of managing environmental compliance.

Key Features	Use
Preparing Compliance Scenarios	You can create compliance scenarios in which you can assign the applicable compliance requirements to the locations. To fulfill these requirements, you can create data collection, sampling, data calculation, and aggregation activities. You can create and assign tasks to persons responsible for their completion to ensure the orderly running of industrial equipment and facilities at your locations. You can assign environmental limits to your compliance scenario activities so that the system can check the collected or calculated data based on these limits. You can set up an automatic collection of data from external system like data historians and sensors so that you can use them to manage environmental compliance.
Managing Compliance Tasks	You can create tasks that are related to a compliance requirement. To trace your compliance to that requirement, you can make a reference between the created tasks and the requirement. You can reschedule tasks as needed or set task recurrence to manage compliance continuously over time.
Processing Tasks	You can receive the tasks assigned to you in your inbox and record their completion with comments and attachments. If you are the owner of multiple compliance tasks, you can monitor and process tasks and outcomes.
Monitoring Environmental Data	You can oversee the progress of environment-related tasks or monitor the environmental data recorded in the system using one of the monitor applications. You can analyze the data through various filtering options and sorting options. Additionally, you can forecast environmental data based on past data with the help of predictive learning algorithms and statistical methods. By comparing forecasted environmental data against environmental limits, you can get an early indication of future deviation incidents or noncompliance.
Creating and Managing Deviations	You can create deviation incidents to record, investigate, and report abnormal or incorrect equipment operation that may lead to noncompliance. For better traceability, you can create a deviation incident directly as a follow-up of a task.

Key Features	Use
Analyzing Compliance	You can analyze the environment-related data in the system from compliance scenario activities by location, data type, and other relevant criteria. You can export the data for further checks or reporting purposes. Additionally, you can analyze the processing of tasks related to compliance requirements, group them by status, location, compliance requirement type. You can adapt your task analysis by adding multiple steps to it. This way, you can have an up-to-date overview of compliance requirement tasks.

Managing EHS Locations

You can create and edit locations and specify a location hierarchy. You use locations, for example, to specify a workplace where emissions are produced.

To manage EHS locations, you can use the following features:

Key Features	Use
Location Import	If you want to reuse locations that exist as technical objects in a plant maintenance application, you can import them as locations into Environment, Health, and Safety Management. You can also import locations and location structure from third-party sources through a spreadsheet upload in the SAP S/4HANA migration cockpit.
Location Structure Editing	You can insert locations at different positions into a location structure to represent where these locations exist spatially or functionally in your company. The location structure also allows you to make mass changes to the attributes of multiple locations in one go, instead of having to maintain each location individually.
Location Editing	You can add new locations to the location structure or edit the master data of locations that already exist within the structure. Location master data includes the plant or company code to which that location belongs, and the precise position of the location. For locations that have been created manually, you can also establish links to technical objects.

3.4.3.2.1 Integration with Footprint Assessment

Business Background

SAP S/4HANA supports the integration with a footprint assessment solution (currently SAP Product Footprint Management) to allow you to consider product footprint information available in this footprint assessment solution in your business decisions.

Key Features

When a footprint assessment solution is integrated, SAP S/4HANA supports you to access product footprint information in the footprint assessment solution.

3.4.3.3 Health and Safety Management

Business Background

You use the health and safety management solution to assess risks within your organization as they relate to the environment or health and safety of people. This enables you to comply with regulations and gain a comprehensive insight into the situations that involve risks. This solution supports you in identifying, analyzing, evaluating, and managing risks. You can take the appropriate actions necessary to reduce risks to acceptable levels and prevent any harmful effects to the health and safety of your employees and the environment.

Key Features

The following scenarios and key features are supported:

Managing Chemicals for Health and Safety Processes

You can approve chemicals prior to their use in your company, and enter relevant information for chemicals for which you need to assess risks. Additionally, you can create documents, such as safety instructions, that are used to inform employees about all health, safety and personal protection relevant aspects of the chemicals they use.

To manage chemicals for health and safety processes, you can use the following features:

Key Features	Use
Chemical Approval	You can use the approval process for chemicals to ensure that new chemicals that are introduced in your company are approved from a health, safety, and environmental aspect before they are ordered. This approval process can be configured to involve several parties, and you can specify several steps to be carried out by each approver.
Data Entry for Chemicals	You can enter information provided on safety data sheets and use the information for a subsequent risk assessment process. You can trigger the data entry for chemicals from the approval process or create a chemical manually and enter the relevant information.
Initiation and Processing of Risk Assessments for Chemicals	After the approval of a chemical, you can start the risk identification process by identifying chemicals used at a certain location in your company.
Creation of Safety Instructions	As part of the risk treatment for chemicals, you can create safety instruction documents for chemicals at a certain location. A safety instruction summarizes all health and safety relevant information for a chemical, as well as the required protective equipment for safe handling at the location. This document can be used to train employees and inform them about safe handling of the chemical.

Managing Safety Instructions

You can create and manage safety instructions in central repositories according to their type: safety instructions for substances, for equipment, and generic safety instructions. The flexible concept of generic safety instructions enables you to create additional safety instructions others than for substances and equipment. For every safety instruction type and every plant in your company, you can define an individual setup of the safety instruction chapter structure.

To simplify the manual procedure of creating safety instructions and ensure consistency, you can define reusable text blocks.

To manage safety instructions, you can use the following features:

Key Feature	Use
Manage Safety Instructions for Substances	To create a safety instruction for substances, you can use automatic functions to derive data from the chemical business object and at the same time have the additional opportunity to add information manually wherever necessary

Key Feature	Use
Manage Safety Instructions for Equipment	To create a safety instruction for equipment, you can use automatic functions to derive data from existing risk assessment projects and at the same time have the additional opportunity to add information manually wherever necessary.
Manage Generic Safety Instructions	Create safety instructions for types other than substance and equipment, for example, biohazards. The information for generic safety instructions has to be added manually.
Manage Safety Instruction Text Blocks	Define frequently used text snippets as text blocks to be used in safety instructions.

Managing Hazardous Substance Inventories

You create hazardous substance inventories according to your country's/region's regulations. Some regulations stipulate to maintain an inventory of all your hazardous substances for your locations together with information about the annual tonnages.

According to other regulations, for example, according to the Superfund Amendments and Reauthorization Act (SARA) in the United States of America, you have to sum up the daily stock movements and determine the daily maximum and average amounts as well as the number of days within the period where a substance or a hazard category was on stock. To prepare hazardous substance data for corresponding reports, you can use a fully-automated process.

To manage hazardous substance inventories, you can use the following features:

Key Feature	Use
Manage Hazardous Substance Inventories	Manually create and manage inventories for your locations. The revision and the release concept help you to keep track of your changes and ensure that only one legally binding version of the inventory is available at one point in time you.
Search Hazardous Substance Inventory Data	You can search through all revisions of your inventories.
Extract Data for SARA 312 Reports	Fully-automated process to prepare data for SARA 312 reports..
Analyze SARA-Relevant Stock Details	Analyze details regarding stock information extracted for SARA 312 reports.

Monitor Safety-Relevant Changes

To keep your safety instructions, hazardous substance inventories, risk assessments, and chemical approvals up to date, it is important to be aware of safety-relevant changes done to chemical substances. This function tracks all safety-relevant changes of chemical business objects and provides a work list comprising all safety-relevant processes that could be affected by the changes.

Managing EHS Risk

You can identify, analyze, evaluate, and treat risks that exist in your organization. You can take workplace samples to analyze exposure data for agents and compare exposure data to occupational exposure limits (OELs) set by your organization or regulatory agencies. In this way, you can determine whether exposure levels

are acceptable for the corresponding locations or jobs. You can minimize identified risk within your organization by implementing risk-related controls and tasks.

After you have assessed and treated a risk, you can communicate information about the risk at a location and the controls to reduce that risk to a plant maintenance process. In this way, the maintenance planner can include the risk information for the maintenance worker. You can also set up the application to receive requests to perform risk assessments from an integrated system, such as *SAP Management of Change*

To manage risks, you can use the following features:

Key Features	Use
Risk Identification	You can identify risks that exist at specific locations or jobs within your organization. This involves identifying the hazards, agents, and impacts associated with each risk. You can also specify existing controls that are used to minimize the risk.
Risk Analysis	You can use different assessment steps to analyze identified risks and determine risk levels for inherent risks and initial risks. The assessment steps for each risk assessment type are customizable, and you can use the standard analysis methods or incorporate your own analysis methods. Different analysis methods, such as an exposure analysis, are available for risk analysis. However, you can also define additional analysis methods or adapt the existing analysis methods according to your requirements. If you want to analyze the risk for a specific person or group of persons, you can create similar exposure groups (SEGs) based on locations or jobs. Employees that work at the location or carry out the job and are exposed to the same agents can be grouped together. You can measure exposures for a small sampling of people and use this data to generate personal exposure profiles for all persons in the similar exposure group.
Workplace Sample Management	You can take samples in a workplace sampling process to measure the exposure of workers to hazardous agents or their components. Workplace sampling provides, as a measurement result, the average value weighted over time of an agent at the workplace. The result can be a shift average value or a short-time value in accordance with the short-time value concept. Workplace sampling can also be used to check the effectiveness of implemented controls.

Key Features	Use
Risks Evaluation	Based on the results of risk analysis, you can evaluate risks to determine whether they are acceptable for your organization, or must be reduced through risk treatment. You can either evaluate risks manually or use automatic risk determination to determine risk acceptability based on your configuration settings.
Risk Treatment	To reduce the risk level of risks that are not acceptable, you can define new controls. You can specify how the control is to be applied, for example, which material or personal protective equipment should be used. You can also specify tasks for implementing each control. After all relevant controls have been implemented, you can repeat risk analysis and risk evaluation to ensure that the risk has been reduced to an acceptable risk level. When a control is faulty or needs replacing and is already implemented in treating risks, you can replace it with either a completely new control or just change how the control is applied. You can select the affected locations and instances of the control, and make the replacement all at once to reduce administrative effort. To treat health risk resulting from exposure to agents in the workplace, you can recommend that health surveillance be conducted to monitor the health of employees. You can then transfer your recommendations to an occupational health application.
Risk Monitoring	After a risk assessment is completed, you can continue to monitor and review the identified risk at your organization to verify that risk data remains valid, and that risk treatment is effective. You can schedule recurring control inspections, specify the inspection questions used to evaluate control effectiveness, and create any required follow-up risk assessments.

Managing EHS Locations

You can create and edit locations and specify a location hierarchy. You use locations, for example, to specify a workplace for which a risk assessment is carried out.

To manage EHS locations, you can use the following features:

Key Features	Use
Location Import	If you want to reuse locations that exist as technical objects in a plant maintenance application, you can import them as locations into health and safety management.
Location Structure Editing	You can insert locations at different positions into a location structure to represent where these locations exist spatially or functionally in your company. The location structure also allows you to make mass changes to the attributes of multiple locations in one go, instead of having to maintain each location individually.
Location Editing	You can add new locations to the location structure or edit the master data of locations that already exist within the structure. Location master data includes the plant or company code to which that location belongs, and the precise position of the location, which can be visualized on an integrated map. For locations that have been created manually, you can also establish links to technical objects.

3.4.3.4 Management of Change

Business Background

More and more companies have realized that changes can have a negative impact not just on people or the environment but on the business itself. A change to improve one business objective often has unintended negative consequences on another business objective, be it product quality, safety, or operational costs.

Management of Change helps you manage and streamline changes to products, procedures, processes, and equipment. You can monitor and organize reviews, approvals, and other actions necessary to implement the change, such as updating documentation, training materials, or master data. Employees can communicate change requests easily. Based on standard templates, you can decrease implementation and adoption costs and ensure that the company-specific or industry-specific change procedures are followed. As a result, the business can make changes that facilitate growth – without disrupting operations or harming employees, assets, or the environment.

Key Features

The following table explains the key features available:

Key Feature	Use
Creating Change Requests	You can request a change based on a selected type and provide basic information, such as a description of the change.
Reviewing and Evaluating Change Requests	You can check if the provided information is clear and sufficient. You can collect additional information as required and involve multiple disciplines, for example, engineering, operations, and health and safety. Customizable questionnaires help to capture all relevant details and to control the process.
Approving Change Requests	Based on the collected information and evaluation results, you decide whether the change is to be implemented.
Driving Change Requests and Performing Activities	A change request contains activities such as tasks and approvals. Each activity is performed by the assigned responsible person. You can verify the activities that have been determined for the change request and adapt them to the requirements. Then, you can monitor and control the implementation of the activities.
Closing Change Requests	You can verify that all activities are completed. You can close the change request.
Analyzing Change Requests and Activities	You can get important insights by exploring and analyzing the data for change requests and activities in the system in an interactive way. You can analyze the data step-by-step by various criteria and through data visualizations.

3.5 R&D / Engineering

3.5.1 Enterprise Portfolio and Project Management

3.5.1.1 Portfolio Management

Business Background

Portfolio Management capabilities give high-level visibility over the entire project portfolio, portfolio analytics and resources.

Portfolio Management provides a comprehensive and up-to-date view of the entire portfolio of company projects to present the full extent of project risks and opportunities. It allows you to overcome delays that can occur as information is collected from disparate sources. Portfolio Management gathers diverse data into dashboards which act as a starting point for portfolio analysis.

Portfolio Management integrates information from existing project management, human resources, and financial systems to provide an overview of the project portfolio and resource availability, and it provides easy drilldown to details.

Key Features

The following table explains the key features available:

Key Feature	Use
Portfolio and bucket hierarchy management	You use a portfolio to map the strategic structure of a company. There could either be one portfolio for the overall company, or different portfolios, reflecting independently managed areas. One portfolio is a single entity and not related to other portfolios. The overall structure of a portfolio is reflected in the hierarchy of buckets. This allows you a flexible categorization of portfolios. Portfolio Management supports multi-level portfolio hierarchies. Buckets represent, for example, product lines, organizational or regional structures. Once you have set up the bucket hierarchy, you can add items to the buckets, plan the budgets and the resources and do the assignment accordingly. You can also create alternative portfolio hierarchies.
Item management	You use portfolio items to represent, for example, proposals, projects, concepts (anything that should be analyzed within a portfolio). Portfolio items can have dependencies to other items. You can create versions of a portfolio item. You can create versions of an item or of a portfolio initiative (initiative) to document the status of an item at a certain point in time (snapshot) or to simulate changes (simulation). Decision points represent gates through which an item passes, for example, from specification to design or from design to implementation. Each decision point can have several configurable status values.

Key Feature	Use
Initiative management	You use an initiative to manage a set of portfolio items to achieve a specific goal of a bucket. For example, a new product initiative represents all phases of discovering, designing, developing, go to market, and maintenance of a single product. Each initiative is assigned to a certain bucket and different items can be assigned to an initiative. It consists of a set of attributes and as well as, for example, questionnaires or scoring models. You can define persons responsible for initiatives by staffing roles. You can use the checklists function to create and edit checklists and checklist items of initiatives. Checklists help you to define the deliverables, such as KPIs or documents that are mandatory for a phase approval. You can monitor the status of the deliverables.
Collection management	You can group related portfolio items with a common strategic goal to collections. A collection has its own reporting cockpit to enable portfolio managers to monitor the performance of the collection.
Review management	Portfolio reviews enable you as a portfolio manager to make fact-based decisions. A review can take place when a certain item or initiative has reached a certain decision point, for example. The portfolio items within a review are evaluated and compared within scoreboards.
Financial and capacity planning	You use financial and capacity planning to store and plan financial and capacity data for your project and to maintain actual cost data. You can maintain financial and capacity planning data for a bucket, item, and initiative. You can view financial and capacity data on different levels, for example actual or planned costs, labor cost or material costs, cost for furniture or equipment. You can aggregate financial and capacity data from between items, initiatives, and buckets using rollup. You can integrate data from the Finance area of SAP S/4HANA or from Project Management. You can define that financial and capacity planning data for an item or an item of initiative is retrieved from a financial and controlling system or project management instead of manually entering the data. In the item financial planning, you can see the actual costs stored in the Finance area of SAP S/4HANA.
Scoring and questionnaires	You can compare portfolio items or initiatives in a scoring model based on quantitative key performance indicators. This enables decision makers to make educated decisions on portfolio items or initiatives. For the aggregation of data, you can implement different scoring models. The quantitative scores of a scoring model are retrieved either from portfolio item or initiative attributes or can be filled by results of questionnaires. Based on questionnaires, you can use qualitative criteria to get numerical scores for risk, strategic fit, feasibility, and other types of soft data of portfolio items or initiatives.
What-if scenario management	You can simulate changes in the budget assignment or capacity assignment and find out what the impact is on the respective items. You can see the result of the simulation in the reporting cockpit, such as the reviewed items. You use what-if scenarios to support your decisions.

Key Feature	Use
Printing of forms	You can preview and print the detailed data of items and initiatives. The data printed in the PDF-based print form reflects the data that is displayed on the user interface. You can configure the PDF-based print form so that the data is displayed and printed according to your needs.
Managing Documents	You can manage your documents in Portfolio Management using a document repository.
Authorizations at object level	You can define object-specific authorizations for portfolios, buckets, items, initiatives, reviews, collections and decision points.
Export or import of project data	You can use the following import and export functions to exchange data between Portfolio Management and other applications: • You can import or export a project associated with a portfolio item from or to a generic XML file. • You can import or export project data from or to the project system in SAP S/4HANA. • You can import data from Project Management into Portfolio Management. • You can export project data from Portfolio Management to a project management system that is installed on a different server. For more import/export functions see the Project Management chapter.
Recording changes / change document	A change document in Portfolio Management provides electronic documentation of changes made to attributes of objects or entities. Depending on the settings in the data dictionary and Customizing settings, change documents can be generated in the context of new object creation, change or deletion of objects or entities. If you have activated change documents for an object, the system tracks all attribute changes to these objects.
Archiving	You can archive the data of the following objects: • Portfolios • Buckets • Items • Collections • Initiatives • Reviews

3.5.1.2 Project Management

Business Background

Project Management helps you standardize and improve project management execution and reduce associated administrative and system costs, by providing reliable project management functions that can be deployed independently or integrated into your, for example, Human Resources or Financials back-end system. Project Management is ideal for managing phase-based projects. It delivers highly specialized support for product development, IT, or other types of projects. It supports structuring, scheduling, visualization, operative planning, and execution.

Key Features

The following table explains the key features available:

Key Feature	Use
Project elements	You use the following project elements to reflect the projects of your company: • Project Definition: A Project definition is the project element at the highest hierarchy level of a project. The project definition contains general data of the project and information that is valid for the whole project. • Phases: A phase is a clearly defined period in a project. A phase belongs to the project definition and and you can further subdivide a phase using checklists and tasks. • Tasks: In projects, tasks help to record and structure necessary processing steps. You can assign tasks, for example, to a project definition or a phase. • Checklists and checklist items: Checklist items represent important requirements that have to be met in order to achieve the project goal. Project participants check off the items they have finished. You can group checklist items in a checklist. • Roles: A role represents a position in a project, for example, the role of consultant in a consulting project. The role describes which type of resource is required in a project, that is, which function the resource carries out in the project. The role includes information about the qualifications that the resource should have and when and for how long the resource should be available.
Displaying and editing project details	You use various apps, dashboards and views (including Gantt chart) to get an overview of your projects, to get a detailed insight into the project details, and to edit your projects.

Key Feature	Use
Project templates	You can create templates that you can use every time you create a project. This allows you to better standardize your projects. You can create templates for the following objects: • Projects • Checklists • Documents You can include phases, tasks, and checklist items from project templates or checklist templates in operational projects or other templates along with the lower-level project elements that belong to them. The subtrees are copied when you do this.
Scheduling	You can use the following functions to schedule your projects: • For each project type, you can choose whether you want to use bottom-up scheduling or top-down scheduling. • You can enter fixed dates for the project elements. If you do not enter fixed dates for the project, the system sets the current date as the start date. The system calculates the finish date from the remaining project data during scheduling. • You can enter phase dates that overlap as well as task dates or checklist item dates that are outside the phase dates. The system informs you if the dates overlap each other by displaying messages in the log. The system uses messages to inform you of any conflict situations during scheduling, for example, if task dates are outside the time frame of phases during top-down scheduling. • You can enter a duration for phases and tasks. • You can enter fixed dates for the planned start and the planned finish, and can assign a calendar for project definitions, phases, and tasks. • For checklist items, you can only enter a fixed date for the planned finish. • You can schedule each project element individually. When the dates are scheduled, the dates of the dependent project elements (lower-level elements and linked elements) are taken into account and also scheduled.
Confirmation	You can confirm tasks or checklist items in Project Management.
Project versions	You can create project versions for operational projects. The following version types are available: • Snapshots enable you to create a momentary representation of an operational project so that you can track the status of the project at different times. Snapshots cannot be changed. • You can create simulations to test, for example, the effects certain changes will have on an operational project. You can save simulations and call them again later on. If the changes produce the desired result, you can reconcile the simulation with another simulation or with the operational project.

Key Feature	Use
Accounting integration	You can monitor the costs and revenues throughout the duration of the project. You can use this function to carry out preliminary costing for the costs and revenues. Once the project has started, you can analyze the costs and compare them to the planning data at any time. You can measure the success at the end of the project. Project accounting offers different scenarios: • Task-based or role-based: You can enter planned times as either work for tasks or demand for roles or assigned effort for resources. In order to represent both of these options in costing, you can carry out task-based or role-based costing. • Account assignment object: Internal order or WBS element • Manual or automatic: Manual or automatic assignment of the accounting object
Multi-project management	You can map cross-project relationships. The following inter-project link scenarios are available for this purpose: • Subproject: When you work with subprojects, a task of a project is created as a separate subproject, for example, because a different department or a subcontractor is responsible for the task. To map this relationship, you create an inter-project link between the task of the master project and the project definition of the subproject. • Mirrored task: If tasks or phases of a project are influenced by another task (see original task) in a different project, the project leader of the dependent project must be informed about changes made to the original task. For this purpose, you can include the original task as a mirrored task in the structure of the existing project. • Program: Larger projects are often realized in several different projects that belong together. In order to map these complex project structures, you can assign other projects or programs to a project with the project category program
Multi-project monitor	You can call and compare multiple projects, tasks, or checklist items at the same time.
Object links	Business objects important to a project can be located in different systems. Since it is important to have an overview of these objects directly in Project Management, you can connect the objects which you defined or activated in Customizing for Project Management to the application as object links. You can create object links to various SAP objects.
Managing documents	You can manage your documents in Project Management using a document repository.
Integration with Portfolio Management	You can assign projects to portfolio items. You can also assign phases to decision points in Portfolio Management at a lower level. This assignment is the basis for a synchronization between the objects in Project Management and Portfolio Management.

Key Feature	Use
Project status reports	You can summarize project data in reports and store them as project status reports. The reports are created as interactive PDF documents and stored either in Project Management or in a document management system. The system provides a number of different report templates depending on the project type. These can contain different kinds of data.
Evaluations	Evaluations give you an overview of your project data. When you create an evaluation, the system checks whether predefined threshold values have been violated. You can base your evaluation on the current project data or the last version of the data that was saved in the background. You can create evaluations for both operational projects and project versions.
Authorizations at object level	You can define object-specific authorizations for projects or parts of projects.
Export or import of project data	You can use the following import and export functions to exchange data between Project Management and other applications: • You can import or export project data from or to Microsoft Project. • You can import or export a project or version from or to an generic XML file.
Recording changes / change document	Project Management provides you with a means of recording changes that you can activate. If the option for recording changes is active for an object, changes you make to dependent objects are also recorded. For example, for projects, the system not only records changes you make to the project itself, but also records the changes to dependent objects such as the phases, checklists, approvals, and roles. If, for example, you want to record changes to roles, the recording option must be active for projects.
Archiving	You can archive project data and documents, which are assigned to projects.

3.5.1.3 Resource Management

Business Background

Resource Management provides planning tools to support you in planning and optimizing your human resource deployment within a project as well as across different projects.

Key Features

The following table explains the key features available:

Key Feature	Use
Project resource planning	You can use a planning tool to optimize your human resource deployment in a project. It focuses on using your employees efficiently and assigning them to projects based on demand, qualifications, and availability. It offers a role based resource management, and a project or line manager can staff resources on the project. The project lead first uses roles to depict which type of resource is required in a project, that is, which function the employee (resource) carries out in the project. A role represents a position in a project, for example, the role of consultant in a consulting project. The role includes information about the qualifications the resource should have and when and for how long the resource should be available. The project lead can assign tasks to the roles or resources straight away. In the resource search, the system determines suitable resources for each role and task on the basis of their qualifications. The project lead's or customer's preferred resources can be stored as candidates in the system. In the staffing process, staffing or candidate managers can also determine resources based on their availability. The project lead or resource manager can first reserve their preferred resource or assign the resource straight away. At the same time, the project lead can send e-mails to resources with details of the project, directly from the application.
Cross project resource planning	You can plan and optimize your human resource deployment across different projects. You as a resource manager get a quick overview of resources and the resource availability across multiple projects and roles. You get also an overview of the project and role staffing, the resource assignment and the staffing across multiple roles, projects, and resources. As a resource or staffing manager, you can either maintaining assignment per resource in the individual periods or maintaining this data across a certain time range using distribution.

3.5.1.4 Commercial Project Management

Business Background

This function provides special features that help in the core business process requirements of companies that offer project-based services to their customers. Commercial Project Management covers multiple processes in

an end-to-end scenario spanning the selling, planning, executing, monitoring, and controlling of projects. Companies that sell projects (for example, in the professional services or the engineering, construction, and operations industries) can use these solutions to further professionalize their core business processes and expand beyond back office capabilities.

Key Features

The following table explains the key features available:

Key Feature	Use
Project Workspace	Project Workspace provides the following features: • The commercial project that integrates multiple business objects that are used in a real-world project setup. • A project workspace to monitor and manage the different aspects related to a commercial project. • A framework to configure and personalize user-specific alerts and notifications. • The ability to set up teams and assign roles and responsibilities to members. • A billing plan manager to plan and execute billing events such as fixed price and resource-related billing. • The ability to report and manage qualitative project risks. • The integration with Project Cost and Revenue Planning to enable project cost planners and controllers to plan and forecast project-related costs and revenues. • The integration with Project Issue and Change Management to document, estimate, and track issues and changes that occur during project execution. • Embedded Analytics, based on business intelligence (BI) queries, for reporting on the project cost status, progress, unbilled revenues, receivables, forecasting, earned value, cost performance index, scheduled performance index and issue and change process. Key project information such as planned, actual, and forecast values are reported per month following the Gregorian calendar. • *Multiproject Overview* provides information about all the projects for which a project manager is responsible. With this app, you can display KPIs such as planned and actual costs, planned and actual revenues, estimate at completion (EAC) costs, planned and actual margins, EAC revenues and margins, receivables, and unbilled revenues, for example. You can also use alerts, statuses and general information of the projects, with the ability to edit some features. • *Single-Project Overview* provides a quick health check of the project to the project manager. You can view KPIs, statuses, EAC costs, EAC revenues, trends, margins, and alerts, for example. You can also drill down to detailed information in the existing project workspace, for further actionable items. You can navigate to billing and procurement. • *Billing and Receivables Overview* brings together project billing due dates, pending invoices, and payment history of one or more projects with access to related finance documents, ensuring timely billing and invoicing for the services delivered.

Key Feature	Use
	• *Procurement Overview* provides a holistic view of the procurement of material, services and subcontracts, with a view of expedited shipments, delivery and payment schedules, allowing you to coordinate the scheduled workflow of your project. • *Project Activities* displays a list of activities from issues, checklists, change requests, and risks, and enables users to track and process assigned activities. • Enabling of Enterprise Search based on the following business objects of Commercial Project Management: commercial projects, financial plans, issues, and change requests. • With the use of APIs, you can create commercial projects and bid plans based on CRM opportunities. • Ability to view and control change logs of specific fields in commercial projects, risks, checklists, and contact persons.

Key Feature	Use

Project Cost and Revenue Planning	Project Cost and Revenue Planning provides you with the following features:
	• Planning scenarios to support key project planning activities such as resource planning, material planning, expense, and third-party planning.
	• Harmonized input data and commercial-project-specific planning assumptions through an interactive and iterative process.
	• Ability to automate quantity, cost, and revenue forecasts
	• Planning functions to support automatic valuation, cost and revenue calculations, revaluations, forecasting, simulations, and data transfer.
	• Process integration with key downstream processes such as resource management, procurement, and billing.
	• Distribution key to define a curve based on which quantity, cost, and revenue of a planned resource can be distributed across periods. Factors such as type of work or seasonality determine the distribution curves of a resource.
	• Simplified integration that allows planning based on SAP Portfolio and Project Management structures linked to Project System (PS) projects.
	• Ability to view and control change logs related to specific fields of financial plans, on the financial plan screen.
	• A typical project lifecycle includes the following phases which are also relevant for project cost and revenue planning:
	  ○ Bid and Proposal Estimation
	  This phase usually involves planning the project in sufficient detail to support the creation of bids by providing a proposal or quotation. High-level financial plans are created for overall quantities and requirements such as labor, materials, and expenses but perhaps not with as much detail such as specific resources or with specific subcontract quotes.
	  ○ Baseline Cost and Revenue Planning
	  This phase involves planning the project baseline after a bid has been successfully won. Project planners or project managers create detailed plans to arrive at detailed cost and revenue plans, and to facilitate subsequent execution activities such as resource management, procurement, and scheduling.
	  ○ Revisions and Supplements
	  Revisions and supplements are typically carried out using a similar process to the original proposal and baseline phases. This allows for revision of financial quotes or execution plans based on the additional or changed work.
	  ○ Forecasting and Estimate to Completion
	  Forecasting is often an iterative activity to determine the progress of the project and determine the potential outcome in terms of cost and final revenue. The method of forecasting depends on the type of business (for example, engineering and construction or professional serv-

Key Feature	Use
	ices) and the type of project with different manual and automated approaches. ○ Project Monitoring and Control Throughout project execution the project manager and the controller need to monitor the actual project results versus the plan at the appropriate planning levels such as cost, revenue, or margin. All through the planning process and the execution phase it is necessary in applicable scenarios to provide integration with the follow-on execution activities, which could include: ○ Resource planning ○ Purchasing ○ Time and expense worklists ○ Sales orders, billing plans ○ Sales pricing
Project Issue and Change Management	Project Issue and Change Management provides you with the following features: • Processing of issue and change request activities relevant to different types of business objects • Integration with the multiple application components in SAPS/4 HANA to allow the possibility to exchange data and post updates • Cost and revenue planning of changes (if you are integrated with Project Cost and Revenue Planning • Documentation and processing of project issues and changes using DMS documents, reference URLs, and attachments (such as word processing documents, spreadsheets, drawings) • Reporting and analytics • Integration with e-mail functions for notifications • Collaboration among multiple stakeholders using activity management, which is tracked with statuses • Approval process for changes • Ability to control change logging related to specific fields on the change request and issue screens.

3.5.2 Product Lifecycle Management

3.5.2.1 Product Development

3.5.2.1.1 Embedded Systems Development

3.5.2.1.1.1 Embedded Software Management

Business Background

Embedded software is computer software that is embedded in one or multiple products. It provides functions together with various hardware and systems.

Embedded software has a specific requirement on the hardware and software that allows it to function accurately. To manage the compatibility information between software and other parts of a product, you can use constraint management.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing Constraints	You can view and maintain the compatibility information of the following: • Hardware constraint: the compatibility between embedded software and hardware • Software constraint: the compatibility between embedded software and another software You can also check the software compatibility in a bill of material (BOM), or in a product structure after simulating the explosion of the product structure.

3.5.2.1.1.2 Systems Engineering

Business Background

Systems engineering offers an interdisciplinary approach to design and manage complex systems in product development. The development of an intelligent product during its lifecycle often involves various systems and components that are interconnected to each other. To enable requirement driven development and enhance traceability for requirement, use requirement assignments management.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing Requirement Assignments	You use this feature to assign requirements to business objects involved in product lifecycle management.

3.5.2.1.2 Visual Instance Planner

Business Background

Visual Instance Planner (VIP) is an application that enriches the engineering structure of the Product Structure Management (PSM). The application is intended to bring 3D data into PSM using variant configuration. The application allows you to create variants based on the 3D data and map the geometric instances onto the variants.

Key Features

The following table explains the key features available:

Key Feature	Use
Starting a planning session in Visual Instance Planner.	This feature allows you to start a planning session to create variants and map geometric instances onto the variants directly from PSM. When planning is complete, the plan is saved back to PSM.

Key Feature	Use
Working with a product structure	This feature allows you to modify, validate, and save the actions performed on the product structure.
Adding instances to the product structure	This feature allows you to assign geometric instances to the product structure.
Adding instances automatically to the product structure	This feature allows you to assign geometric instances automatically to the product structure.
Maintaining object dependencies	This feature allows you to display, create, or change object dependencies using the dependency maintenance tables for variant configuration on the Web UI.
Navigating to product structure	This feature allows you to view the product item and the product item variant if exists in the PSM Web User Interface.

3.5.2.1.3 Visual Asset Planner

Business Background

Visual Asset Planner is a solution for SAP Enterprise Asset Management (SAP EAM) for restructuring the design structure (derived from the CAD) to match the asset structure. It also creates 3D design data for the asset structure.

You can load multiple SAP 3D Visual Enterprise source files or manufacturing bill of material (MBOM) with visual representation generated from SAP 3D Visual Enterprise Manufacturing Planner as source structure. You can also load functional location hierarchy, equipment (spare part), or equipment structure as a target structure. The solution allows you to create a visual link for these technical objects.

Key Features

The following table explains the key features available:

Key Feature	Use
Starting a planning session in Visual Asset Planner	This feature allows you to start a planning session to restructure the 3D design data from CAD to match the asset structure and create viewable for the asset from the SAP S/4HANA system.

Key Feature	Use
Working with functional location hierarchy planning	Functional location hierarchy planning allows you to restructure the 3D design data and generate a file depicting the functional location hierarchy with the relevant metadata tagging from SAP S/4HANA. The generated file can be used for maintenance and service purposes. The target for this scenario is a functional location hierarchy and the file that is generated is linked to the top level functional location.
Working with spare parts planning	Spare parts planning allows you to create a visual spare parts file for an equipment from document structure or material BOM which contains 3D files. The source for this scenario is an equipment and the generated file that is linked to equipment can be used for spare part selection process in Asset Management.
Automatically assigning visual nodes to functional location or equipment hierarchy	This feature allows you to automatically assign visual nodes to functional location or equipment by comparing the metadata identifier between source and target structure. Automatic assignment is only possible for planning scenario functional location hierarchy planning.
Saving and creating a document info record	This feature allows you to save the asset planning at any point in time. This generates a VDS file by exporting the visuals from the target panel and the metadata from the target structure to be tagged onto the exported file. This file can then be linked to a new document which will be linked to the target functional location as an object link.

3.5.2.1.4 SAP 3D Visual Enterprise Manufacturing Planner

Business Background

The SAP 3D Visual Enterprise Manufacturing Planner application supports you in creating and maintaining manufacturing structures (manufacturing bill of materials (MBOMs) and routings). The application uses engineering structures (engineering BOMs (EBOMs)) as input through a visually guided planning process. It allows you to visualize an engineering structure in the *Source Panel* and maintain MBOMs and routing in the *Working Panel*. You can visualize the final multilevel assemblies in the *Target Panel*.

Key Features

The following table explains the key features available:

Key Feature	Use

Managing planning scope alternative	You can create a new planning scope alternative, change an existing one or delete a planning scope alternative. You can also search and start planning for an existing planning scope alternative based on its attributes
Planning BOM and routing for a planning scope alternative	You can visualize the engineering BOM (EBOM) and plan manufacturing MBOM (MBOM) as follows: • By moving components from *Source Panel* to *Target Panel* • By making a direct copy of the EBOM • By creating your own custom assembly header • By restructuring the planned MBOM to get the desired MBOM.
Maintaining manufacturing structure and routing	You can perform the following functions on the manufacturing structure: • Adding components from EBOM to MBOM • Making a direct copy of an assembly (plan as designed) • Creating a new manufacturing structure • Creating a nonvisual component • Restructuring assemblies in the planned MBOM • Managing routing, quality notification, and object dependency • Exporting and uploading visual work instructions • Allocating and deallocating a component from an operation • Handling a phantom assembly • Integrating with project systems
Simulating and saving changes to a planning scope alternative	When the manufacturing structure is ready, you can save it back to SAP S/4HANA. Based on the manufacturing structure in the planner, the MBOMs and routing component allocation are updated in SAP S/4HANA. If the target MBOMs are configurable, the object dependency is also updated. You can also validate the manufacturing structure before saving to check for errors using *Simulate Save* option.
Starting the application from Product Structure Management Web User Interface	For a planning scope alternative, when the engineering structure is a Product Structure Management (PSM) structure, you can also start planning from the PSM Web User Interface.

3.5.2.1.5 Access Control Management

Business Background

Access Control Management allows you to control access to documents. You can grant access to users or user groups using access control contexts.

Key Features

The following table explains the key features available:

Key Feature	Use
Controlling access to objects	You can control access to a set of documents by assigning them to access control contexts.
Context role administration	You can grant access authorizations for a user through a context role.
Transfer the ownership of objects	You can transfer object ownership or assign objects to other contexts.
Add users to user groups.	With user groups you can manage authorizations in bulk when you use them with context roles.
Display and analyze access authorizations of other users.	You can display another user's access authorizations for a document and to determine the sources that grant these authorizations.

3.5.2.2 Engineering Change Management

Business Background

Enhanced engineering change management capabilities can be used to manage various aspects of product data (for example, bills of materials, materials, and documents) within a structured and controlled change process. Support for additional capabilities (including problem report, change request, change order, and change notice) orchestrated by structured and ad-hoc workflows ensure an effective change handling in product development.

These enhanced features can work in conjunction with the features described in the Engineering Change Management [page 103].

3.5.2.2.1 Change Records

Business Background

Change record helps you to effectively manage changes by connecting people, processes, and products. This solution allows businesses to drive the end-to-end change management processes by handling change requests up until their implementation and release.

Key Features

The following table explains the key features available:

Key Feature	Use
Detailed information about the change	Change record acts as a single source of truth for product changes. It contains the details such as the reason for change, expected completion date, participants involved in the change, objects involved in the change, required attachments, and status information.
Business objects for change record	You can integrate business objects from the process and discrete industries, such as materials, bill of materials, BOM items, documents, engineering bill of materials, manufacturing bill of materials, planning scopes, production orders, purchase orders, engineering snapshots, master recipes, inspection plans, recipes, specifications, label sets, order specific routings, planning routings, production routings, product structure variants, routings, and shop floor routing templates.
Enhanced workflows with process route parallel-, ad-hoc-, and background tasks	Workflow tasks can be parallel or sequential, and can be added ad-hoc or via a template; executed by the user or in the background. You can set processing times or deadlines, priorities, and recipients. You can switch from the tabular to the graphical view of the workflow process to get a visual representation of process routes.
Improved user experience in change record	You can display an overview chart to view the change items added in the change record, thumbnails for the representation of change items, graphical representation of process routes, and integrated visual logs for status transitions and digital signatures.
Impact analysis scenarios for change record	You can define impact scenarios and set up rules or constraints. When impact analysis is performed, the impact scenario identifies the objects that are impacted by the proposed change.
BOM redlining for change proposals	You can create redlines to indicate the change proposals in BOM components. When a redline status is approved, it can be applied to the BOM to create a new BOM version or overwrite an existing BOM with change number.

Key Feature	Use
Split and Merge features	Product changes in change records can be efficiently structured using split and merge features. Split allows to divide a change record into two and moves the objects from one change record to another. Merge integrates the fragmented change requests by merging multiple change records into one and creates a successor that contains all items and attachments copied from the source change records.
Digital signature for change records	You can provide compliance support by configuring the system to request digital signatures for dedicated status changes of the change record. Digital signatures can be requested at multiple steps and based on different signature strategies.
Visual status change	Progress indicator allows to view the progress and get an instant overview of the change process using the record statuses.
Dynamic field control	The visibility of fields can be controlled per change record status and the behavior can be changed based on the type of fields and where they appear in the UI.
Option to comment	Commenting option is available at change record header and at change item levels for quick information exchanges.
Integration with Classification System	You can identify the classified objects using specific characteristics and characteristic values with the help of classification system.
Integration with Attachment Service	You can link business objects based on document management with the help of attachment service.
API support for change record	Change record API enables you to generate change records together with the change items and do multiple operations in bulk, faster and in parallel.

3.5.2.2.2 Process Route Templates

Business Background

You can use the process route workbench to activate, transport, import, and search for global process route templates.

Key Features

The following table explains the key features available:

Key Feature	Use
Ability to search existing global process route templates	You can search for global process route templates. The system will provide you an overview of which global templates exist, and whether or not they have been activated or changed since their last activation.

Key Feature	Use
Global process route templates activation	You can activate the global process route templates, which enables you to use in the change record.
Transport of global process route templates	You can add the global process route template to a Customizing request and transport to all other systems in your system landscape.
Global process route templates import via RFC	You can import global process route templates to your current system using an RFC connection.

3.5.2.2.3 Impact Analysis Models

Business Background

You can create impact analysis scenarios, which can be used to perform impact analysis in change records. With impact analysis, you can identify business objects that are impacted during change evaluation.

Key Features

The following table explains the key features available:

Key Feature	Use
Impact analysis scenarios	You can create, edit, or delete impact scenarios. The impact scenario represents the model or the association the object has with the other objects. Change constraints or rules can be assigned to the model which decide the scope of the impact.
Graphical and Tabular views	You can view two different versions of the same data in tabular and graphical format and can easily switch between them.

3.5.2.2.4 Flexible Workflow Templates

Business Background

You can configure workflows to optimize the approval process for legal transactions in change records. You can define workflow templates according to various scenarios in the change process.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing workflow templates	You can define new workflow templates, create new workflow templates based on existing templates, or edit existing templates.
Defining workflow steps	You can create workflow steps, assign specific users or entire roles to your workflow steps, define preconditions for the workflow tasks, and define exception handling.

3.5.2.2.5 Engineering Cockpit

Business Background

You can filter and display an overview of engineering changes and engineering progress for different business objects. You can analyze the data with the help of graphic charts and initiate actions based on your insights.

Key Features

The following table explains the key features available:

Key Feature	Use
Change processes overview	You can view the ongoing change processes and trace their execution statuses.
Quick links	You can navigate easily to the related apps.

3.5.2.3 Recipe Development

3.5.2.3.1 Recipe and Formula Development

Business Background

You use Recipe Development to describe the manufacturing of products or the execution of a process. Recipes comprise information about the products and components of a process, the process steps to be executed, and the resources required for the production.

The recipe types in Recipe Development enable you to create a general description of the requirements or concrete procedural instructions depending on your needs. Making the data of enterprise-wide recipes more concrete allows you derive site- and plant-specific recipes from it.

Key features

The following features are available:

Key feature	Use
Creating and managing recipes	Recipes comprise the information about the production process for a product, as well as the input and output substances and packaging used in that process. The different recipe types enable you to create a general description of the requirements or concrete procedural instructions depending on your needs. Based on the ingredients used, you can also carry out different calculations, for example to determine a product's nutritional value. You can also search and filter recipes based on a wide variety of search criteria and see which recipes contain certain ingredients, materials, and component items (where-used).
Creating and managing specifications	You can use the business object specification for the substance, packaging and recipe properties specification categories. Specifications are data objects that use value assignments for physical and chemical data to define certain properties.
Developing formulas	Material and substance data of recipes is managed in formulas. Here, you store all the relevant information about the products and components of the process.
Defining the recipe production process	You can define a sequence of chemical, physical, or biological activities for converting, storing, or transporting material or energy. The process contains all the activities that are required to produce a product or different intermediate products.
Creating and managing product labels	You use labeling to create and manage label sets. Label sets are based on specifications and recipes, and are used as input for final product label creation and label artwork design. They include lists of data for ingredients, qualitative information (such as nutrients), components and packaging.

Key feature	Use
Checking compliance of recipes and specifications	You can use compliance check to check whether a product complies with certain constraints. These can be, for example, legal constraints or constraints laid down by an enterprise. Compliance check can be used for all substances for which a specification or recipe has been created.

Related features

Classification [page 104]

Bills of Materials [page 101]

Engineering Change Management [page 103]

3.5.2.3.2 Access Control Management

Business Background

Access Control Management allows you to control access to specifications, recipes and documents. You can grant access to users or user groups using access control contexts.

Key Features

The following table explains the key features available:

Key Feature	Use
Controlling access to objects	You can control access to a set of business objects by assigning them to access control contexts.
Context role administration	You can grant access authorizations for a user through a context role.
Transfer the ownership of objects	You can transfer object ownership or assign objects to other contexts.
Add users to user groups.	With user groups you can manage authorizations in bulk when you use them with context roles.
Display and analyze access authorizations of other users.	You can display another user's access authorizations for a business object and to determine the sources that grant these authorizations.

3.5.2.4 Handover to Manufacturing

3.5.2.4.1 Handing Over Product Structure for Production

Business Background

You can use this business process to define a transition of product structures from engineering, such as bills of material or product structures to manufacturing. During the handover, a new manufacturing product structure is created from scratch or an already synchronized manufacturing structure is updated based on changes from the engineering product structure.

The process is focused to keep the engineering and manufacturing product structure synchronous, while only the manufacturing product structure is updated.

Changes from engineering can be handed over to the manufacturing product structure with or without change management.

Key Features

The following table explains the key features available:

Key Feature	Use
Plan Handover of Product Structure	During the planning step the product manager plans to produce a component or product in a specific plant. The planning information is stored within a synchronization unit.
Synchronize Product Structure	The synchronization process itself duplicates all missing BOM objects (header, item, changes states) from the source structure to the target BOM. If you have already documented an intended deviation with an operation, this is also considered during the synchronization. The operation leads to adding or subtracting of an item. It also can overwrite an attribute of the target structure header or item. A comparison of the new proposed target BOM and existing target BOM returns conflicts that you can resolve. This step is mainly executed by the system. The proposed target BOM and the conflicts are presented to the user. The system supports the user with a predefined set of solutions that can be applied to solve the conflict. The source structure can also be displayed for reference. Each resolution of a conflict may lead to an operation, which is also memorized for later synchronizations. At the end the user can store the new or updated target BOM.

3.5.2.4.2 Handing Over Recipe for Production

Business Background

You can use this business process to do the following:

- Create and update a manufacturing bill of material (BOM) using a recipe as data source.
- Create and update a master recipe using a recipe as data source.

The creation or update of BOMs and master recipes typically occurs when the development department has completed product and process definition and this information has been finalized and approved for use in production.

This source information from product development is then made available for creating and updating product structures and data for use by manufacturing. GSS automates creating and updating manufacturing BOMs and master recipes, thereby enabling the user to keep development and manufacturing data aligned, reducing effort and improving data accuracy and consistency.

Key Features

The following table explains the key features available:

Key Feature	Use
Initiate handover of recipe	You select the source for which you want to create or update a manufacturing BOM or a master recipe by navigating in the corresponding recipe. The recipe to be used as source must be in a status that is relevant for the hand over process.
Plan synchronization of recipe to BOM	The synchronization of a recipe to a manufacturing BOM starts with a planning step. During this step, you define attributes for your target manufacturing BOM to be created. Once these parameters have been maintained, you can start the synchronization.

Key Feature	Use
Synchronize recipe to bill of material	If you synchronize the recipe for the first time, the system will display a proposal for a target manufacturing BOM in the reconciliation workbench. There you can review the proposal before you start the creation. If you synchronize a recipe which has been synchronized previously, the system creates a new change state for the target BOM based on the recipe data. In the reconciliation workbench, the system shows the proposed target change state and compares this to the existing BOM change state. All changes are shown as conflicts in the reconciliation workbench. You can resolve these conflicts manually, before you start creation of the new BOM change state. If any errors occur, the synchronization stops and returns details about the errors.
Plan synchronization of recipe to master recipe	The synchronization of a recipe to master recipe starts with a planning step. During this step, you define attributes for your target master recipe to be created, such as: • Plant • Material • BOM Usage • Number of alternative BOM • Change number to be used when updating or creating master recipes (if change number use is required) • Master recipe group and group number Once these parameters have been maintained, you can start the synchronization.
Synchronize recipe to master recipe	If you synchronize the recipe for the first time, the system will display a proposal for a target master recipe in the reconciliation workbench. There you can review the proposal before you start the creation. If you synchronize a recipe that has been synchronized previously, the system creates a new change state for the target master recipe based on the recipe data. In the reconciliation workbench, the system shows the proposed target change state and compares this to the existing master recipe change state. All changes are shown as conflicts in the reconciliation workbench. You can resolve these conflicts manually before you start creation of the new master recipe change state. If any errors occur, the synchronization stops and returns details about the errors.

3.5.2.5 Advanced Variant Configuration

Business Background

Variant configuration is for manufacturing complex products. Manufacturers often have to offer new variants of their products, and new variants can be created by modifying existing product designs as they process the order. The important thing is to react quickly to customers' requirements.

The customer determines the features of the product. A customer buying a car, for example, can choose the features of the car and combine these features as required. The product configurator improves information exchange between sales, engineering, and production. Variant configuration helps the customer or salesperson to put together specifications for the product and ensure that the product can be produced from these specifications.

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Key features

The following features are available:

Key features	Use
Manage configuration model	You can use a configurable product to cover all variants of a product in your company. • A class is used to hold the characteristics that describe a configurable product. By linking the class to the configurable product, you allow the product to be configured using the characteristics of the class. • You can create a super BOM for a configurable product, containing all the components for producing all variants of the product. • Often not all combinations of features are possible for either technical or marketing reasons. You can use dependencies and constraints to control which combinations are allowed • In configuration profiles for configurable objects you define central settings for configuring the object. • You can use variant conditions to influence the price of a configurable product depending on the characteristic values assigned. • You can use single-level and multi-level variant configuration models. • You can use configurable routings.
Manage product variants	You can create a product variant, which is a product that can be kept in stock and that arises from an individual configuration of a configurable product.
Interactive configuration	During configuration, in the sales order for example, the user assigns values to characteristics. Dependencies and constraints coming from the configuration model are brought into consideration. Advanced variant configuration is also integrated into the purchase order.
Configuration simulation	You can use the configuration simulation to check your configuration model. In the configuration simulation, you can test whether you have created the objects correctly and whether your dependencies work.
Low-level configuration	Low-level configuration refers to 'background' explosions of configurable objects, like bills of material (BOMs). For example, it's used in material requirements planning (MRP). Here characteristic values from the sales order are automatically used to determine the BOM components.

Key features	Use
Variant configuration data in embedded analytics	This feature allows you to generate CDS views. You can use these CDS views to publish the classification/configuration information and to visualize it with application data. You can use these to model your own CDS view queries, in which variant configuration data can be combined with other objects, such as a sales order.
SAP Commerce Cloud integrated with advanced variant configuration	Integrating advanced variant configuration with SAP Commerce Cloud is now enabled.
Copy classic variant configuration models	You can copy classic variant configuration models for advanced variant configuration

Related features

Classification [page 104]

3.5.3 Product Compliance

3.5.3.1 Product Marketability and Chemical Compliance

Business Background

With the product marketability and chemical compliance solution you manage chemical compliance for your products across your organization. The features of this business solution support you to ensure product marketability and brand protection, and to reduce compliance costs. They enable you to manage regulatory requirements and compliance assessments of your product portfolio.

Key Features

The following table explains the key features available:

Key Feature	Use
Management of compliance requirements	You can manage substance-related compliance requirements based on legislation, industry standards, and customer or corporate-specific requests. Regulatory information and calculations are the basis for the compliance requirements that your products need to meet. You can group them by purpose. You can create and use further requirements and purposes.
Management of compliance assessment processes	This feature supports you in the compliance assessment process for your product portfolio. • You can start or request the initial assessment of a product and determine the relevant compliance requirements for your product. • The system carries out compliance checks thus supporting you to fulfill relevant compliance requirements for your products. • If the compliance results are affected after a change, the compliance checks are reprocessed. • You can use your compliance assessment results to perform a market assessment for your products. • You can define substance volume tracking for relevant products, including quantity limits and warning thresholds.
Compliance controls embedded in business processes	This feature allows you to embed compliance controls into key business processes: • Substance volume tracking is embedded into and visible in other business processes, such as purchasing, manufacturing and sales. • Requests for compliance assessment are automatically created based on changes in the product master. • Compliance checks are integrated into sales quotation and sales order processing as follows: Based on the market assessment, the quotation or the order is blocked.
Compliance explorer and monitoring	• You can identify critical results from compliance assessments and explore the compliance results of your products and components in more detail. • Additionally, totaled quantities of tracked substances can be monitored, including potential or actual critical situations.
Management and publishing of compliance documents	Templates are used to create documents containing compliance information. The documents can be generated as requested and are part of a release process. In addition to using the documents internally, you can make these documents available to your customers.

3.5.3.2 Dangerous Goods Management

This process enables you to manage data which is needed to classify and process dangerous goods in the logistics chain according to dangerous goods regulations. Compliance with regulations of dangerous goods is an important component of product stewardship to ensure safe packaging and transportation of dangerous goods.

Business Background

Key Features

The following table explains the key features available:

Key Feature	Use
Dangerous goods classification	You classify products according to dangerous goods regulations. The classified dangerous goods are the basis for the processing of dangerous goods and generation of documents with dangerous good data in the logistics chain.
Dangerous goods processing	You manage supplementary data relevant for dangerous goods; this data is then provided together with classification information for document generation.
Dangerous goods embedded into key business processes	Within applications, functionality from dangerous goods processing, such as compliance checks, is embedded into and visible in other business processes, such as sales order and delivery. You can do compliance checks, for example, on modes of transport and mixed loading, as well as within routing, resource, and carrier selection management.
Output of dangerous goods information	You can use dangerous goods information for output on logistics documents.

3.5.3.3 Safety Data Sheet Management and Hazard Label Data

Business Background

With this business solution you manage and create safety data sheets (SDS) and labels according to chemical regulations and requirements. An SDS is an important component of product stewardship. It is legally required in most countries and regions of the world to ensure safe handling of chemicals and other hazardous products. SDS formats can vary from source to source depending on national requirements. SDSs are a widely-used system for cataloging information on chemicals, chemical compounds, and chemical mixtures. SDS information may include instructions for the safe use and potential hazards associated with a particular

material or product. The SDS should be available for reference in the area where the chemicals are being stored or in use.

Label and safety data sheets are important sources of information on hazards, instructions and information on the safe storage, handling, use, and disposal of hazardous substances. This information helps you to minimize risks when using hazardous substances.

Key Features

The following table explains the key features available:

Key Feature	Use
Data management for safety data sheets and hazard labels	• You can enter the necessary data for the generation of safety data sheets and reuse it for multiple packaged products. • The system supports you in deriving SDS-relevant information from product data and regulatory data. • You can use standard text blocks to minimize translation efforts. • You can release the data for SDS generation. • You can reuse the SDS-relevant data for hazard labels.
Safety data sheet generation using templates	• You can use templates to generate safety data sheets. • You can release the generated safety data sheet for subsequent processes. • You can manage revisions of safety data sheets with dedicated version control.
Safety data sheet publishing	• You can send safety data sheets to your customers and to relevant authorities, electronically. The automatic process can be integrated into the sales process. Updated versions of safety data sheets can be distributed automatically. • You can view safety data sheets that provide information required in different business processes, such as, in material management.
Hazard labels embedded into business processes	Hazard label determination is embedded into several business processes, such as make-to-stock, make-to-order, shipment, and receipt of purchase order.

3.6 Sales

3.6.1 Order and Contract Management

3.6.1.1 Sales Order Management and Processing

Business Background

SAP S/4HANA supports the integration with an external pricing service (currently, SAP Omnichannel Promotion Pricing) to help you when you want to reward your customers.

Key Features

When an external pricing service (currently, SAP Omnichannel Promotion Pricing) is integrated and supports the below named features, SAP S/4HANA enables you to grant your customers rewards.

Key Feature	Use
Granting discounts	You can send sales order data to an external pricing service. If the external pricing service returns corresponding data, you can consider granting your customers discounts for specific sales order items.
Granting free goods	You can send sales order data to an external pricing service. If the external pricing service returns corresponding data, you can consider granting your customers free goods for specific sales order items.

3.6.2 Sales Performance Management

3.6.2.1 Advanced Incentive and Commission Management

Business Background

You can reproduce sales structures and set up flexible incentive systems. You use standard agreements as the basis for creating individual agreements and for settling commission cases.

Key Features

Key Feature	Use
Compensation planning	You use this feature to design a consistent remuneration plan, break down your company's strategy to specific sales targets, and to cascade plan changes. You can easily build new organizations into its sales composition and integrate compensation for the sale of newly designed products.
Compensation operations	You use this feature to align internal and external sales targets with a company's overall strategy and to automate sales force compensation for meeting those targets.

3.7 Sourcing and Procurement

3.7.1 Integration with Machine Learning Intelligence

Business Background

SAP S/4HANA supports the integration with a machine learning system (currently SAP Procurement Intelligence) to allow users to optimize their procurement processes.

Key Features

If a machine learning system (for example, SAP Procurement Intelligence) is integrated and supports the features listed below, SAP S/4HANA enables you to use the following key features:

Key Feature	Use
Proposal for creation of catalog items	You can identify free-text purchase requisition items with similar descriptions. The system uses this information to propose the creation of new catalog items. Purchasers can negotiate lower prices for highly requested items identified by the system.
Proposal of material groups	When users create a free-text purchase requisition, the system classifies the description and suggests the most probable material groups.

Key Feature	Use
Proposals for materials without contracts	The system compares materials without a contract to materials with a contract and then proposes the creation of a request for quotation for specific materials. Based on the request for quotation, a new contract can be created.
Prediction of delivery date for purchase order items	Based on a machine learning algorithm, the system can predict the delivery date for purchase order items.
Proposal of catalog items based on images	When employees want to request materials, they can upload images when using the cross-catalog search (OCI 5.0) to find the items they require.
Intelligent approval of purchase requisition items	Based on the history of already approved purchase requisition items, the system can calculate the confidence level for the approval of purchase requisition items.

> **i** Note
>
> Some of these key features require a connection to the SAP Cloud Platform.

3.7.2 Central Procurement

With Central Procurement, you can integrate your SAP S/4HANA system with some other enterprise resource planning systems in your system landscape (that is, SAP S/4HANA, SAP S/4HANA Cloud, or SAP ERP) to offer centralized procurement processes over your entire system landscape. SAP S/4HANA acts as a hub system and the enterprise resource planning systems act as connected systems in this integration scenario.

3.7.2.1 Central Requisitioning

Business Background

This scenario facilitates employees to have a unified shopping experience where they can create self-service requisitions in an SAP S/4HANA system that acts as a hub system.

Key Features

The following table explains the key features available:

Key Feature	Use
Maintaining purchase requisitions	You can use this feature to create purchase requisitions in the hub system for your needs or on behalf of other users, for example a team assistant can procure on behalf of the manager. Purchase requisitions that were replicated from the hub system to the connected system can be edited in the connected system. You can create items for materials or services extracted from external catalogs and from an integrated cross-content search based on SAP S/4HANA. You can also define a value limit for unplanned materials or services that cannot be specified in detail at the time of ordering, by creating purchase requisition limit items. Additionally, you can create free-text items if none of the materials in the connected system or the ones extracted into the hub system matches your requirements.
Creating purchase requisitions in expert mode	You can create central purchase requisitions in expert mode, provided expert mode is enabled for them in the default settings for users. These pur chase requisitions are replicated to the connected system with the selected purchasing document type of connected system. On selecting these purchase requisitions in the hub system, employees will be navigated to the connected system where they can view and edit them.
Using the approval workflow	You can use the flexible workflow for purchase requisitions with either the automatic, one-step, or multi-step approval process. As a configuration expert, you can define recipients using either a role or a user-based assignment and select whether the approval step is to be completed by one or all of the recipients. You can mark a workflow step as optional to automatically skip and move to the next step, when an approver cannot be determined. You can also choose to exclude restricted agents from being approvers of purchase requisition. As an approver, you can get an overview of all the purchase requisitions you are responsible for. You can approve or reject purchase requisitions, and add comments. Based on the workflow configuration, you can also send back purchase requisitions to requestors for rework. As a requester, you can view the approval details of a purchase requisition. You will be notified in case your purchase requisition has been rejected or sent back to you for rework. In case of purchase requisitions that have been sent back for rework, you can read the comments from the approver, make the required changes, and resubmit the requisition.
Monitoring the replication of purchase requisitions	You can monitor purchase requisitions for which the replication has failed in either the hub system or connected systems.

Key Feature	Use
Monitoring extraction jobs for sources of supply	You can monitor extraction jobs for sources of supply that have failed.
Creating purchase orders automatically	The purchase orders are created automatically in the connected systems from the replicated purchase requisitions.
Confirming the receipt of goods and arranging return delivery	You can confirm the received goods in the hub system. As a result, confirmations are posted to the connected systems. If goods are of poor quality or damaged, you can create a return delivery in the hub system for the confirmed goods.

3.7.2.2 Central Sourcing

Business Background

This scenario enables central purchasers to get an overview of all purchasing needs across various plants of your company and to source for all plants centrally. This optimizes the procurement process and increases your savings.

SAP S/4HANA supports the integration with external procurement systems (for example, SAP Ariba Sourcing) that enables automatic creation of central purchase contracts or purchase orders and helps to reduce manual workload.

Key Features

The following table explains the key features available:

Key Feature	Use
Creating central requests for quotations	You can use this feature to find a source of supply centrally for various plants. You can check purchase requisitions for different plants and identify the materials and services that can be sourced together and for which there is no valid source of supply. You can select purchase requisitions from multiple connected systems and create a central request for quotation, maintain the details, add notes and attachments that will be transferred to an external procurement system (currently, SAP Ariba Sourcing) and publish it.

Key Feature	Use
Maintaining central supplier quotations	Central supplier quotations can be created in one of the following ways: • You can create them manually on behalf of suppliers and submit them in SAP S/4HANA. • They can be generated automatically from quotations received from an external sourcing system, for example, SAP Ariba Sourcing if this system is integrated and supports this feature. If such supplier quotations contain notes and attachments, you can view them in the SAP S/4HANA system.
Creating follow-on documents from central supplier quotations	If an external procurement system is integrated and supports this feature, follow-on documents can be created automatically. • Purchase orders can be created from the awarded central supplier quotations directly in the connected systems from which the purchase requisitions originated. • Central purchase contracts can be created based on the awarded central supplier quotation in the hub system.

3.7.2.3 Central Purchase Contracts

Business Background

This scenario enables central purchasers to create central purchase contracts. These are global, long-term agreements between organizations and suppliers regarding the supply of materials or the performance of services within a certain period as per predefined terms and conditions. Central purchase contracts enable purchasers from various parts of a company in different locations to take advantage of the negotiated terms and conditions. Central purchase contracts are created in the SAP S/4HANA system that acts as a hub system and are distributed to the connected systems, such as SAP ERP, SAP S/4HANA Cloud, or SAP S/4HANA.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing central purchase contracts	You can maintain and distribute central purchase contracts of different types and central purchase contract hierarchies. You can create, edit, and display additional information using notes. You can distribute notes at the header and item level of a central purchase contract from the hub system to the connected systems. You can add attachments at the header level for central purchase contracts in the hub system. You can search for legal transactions and assign them to a central purchase contract or to a central purchase contract hierarchy. When creating a central purchase contract, you can create items for materials fetched directly from connected systems, for materials that were extracted from connected systems into the hub system, or for lean services. You can also create free-text items if none of the materials in the connected system or those extracted into the hub system match their requirements. You can create items for a central purchase contract or central purchase contract hierarchy in the hub system to be used for subcontracting. Additionally, you can maintain the payment terms and incoterms at header and distribution levels of a central purchase contract. You can also maintain the shipping instructions at the item and distribution levels. Furthermore, you can cancel a central purchase contract or central purchase contract hierarchy. You can block and unblock items and item distribution lines of a central purchase contract and central purchase contract hierarchies in the hub system. You can display and manage central purchase contracts from third party systems to the hub system.
Making mass changes to central purchase contracts and monitoring them	You can make mass changes to the central contracts on header and on item level for specific values. For example, you can add header and item distributions to multiple central contracts at a time. You can monitor the performed mass changes. You can download central contract information as a spreadsheet, modify it, and upload it to the system. You can create new contracts and also add items, header distributions, and item distributions to existing contracts using the spreadsheet.

Key Feature	Use
Approving central purchase contracts	You can use the automatic, one-step or multi-step approval process for central purchase contracts. After a central purchase contract is approved, it is distributed to the connected systems based on the maintained distribution details. In the connected systems, outline agreements, such as contracts or scheduling agreements, can be created. You can withdraw a central purchase contract sent for approval, edit the central purchase contract and submit it again for approval. You can view the approval details, such as the processors involved and status, for central purchase contracts in the hub system. You can define the deadline by which the workflow step should be completed, beyond which an overdue notification is sent to the approver.
Monitoring distribution of central purchase contract, jobs for release order update and importing release orders	You can monitor distribution of central purchase contracts as well as jobs for release orders updates and react if errors occurred during these processes. You can import release orders to the hub system from the connected systems to provide an overview of the release orders issued against each distributed contract item in the connected systems. The release information is available only for the distribution lines that result in the creation of contracts in the connected systems.
Situation handling	You can use this feature to enable system notifications when a central purchase contract is due to expire or when the consumption level of a specific central purchase contract item exceeds the predefined threshold.
Configuring versions for central purchase contracts and central purchase contract hierarchies	You can configure the settings to manage the versioning of a central purchase contract or a central purchase contract hierarchy and define reasons for changes that result in the creation of newer versions. You can compare information between two versions of a central purchase contract and similarly for central purchase contract hierarchies in the hub system.

Key Feature	Use
Maintaining pricing for central purchase contracts and central purchase contract hierarchies	You can define pricing attributes for central purchase contracts and central purchase contract hierarchies, such as commodities or pricing scale values, and distribute those. You can simulate the price for a central purchase contract item or for central purchase contract hierarchy for a given date in the hub system. You can add conditions with a validity period for a central purchase contract an central purchase contract hierarchy in the hub system. You can create default conditions for a central purchase contract and central purchase contract hierarchy at the item level when the net order price and price unit is maintained in the hub system. You can maintain price change reasons when a condition of a central purchase contract or central purchase contract hierarchy is added, changed or deleted in the hub system. You can define a pricing scale value and scale types for a central purchase contract and central purchase contract hierarchy in the hub system. You can distribute scales and plant conditions for central purchase contract items and for central purchase contract hierarchies in the hub system to the connected systems. You can view the updated net price and condition record information (including scales) in a central purchase contract that is replicated from an external procurement system (currently SAP Ariba) to the SAP S/4HANA hub system.
Scheduling output for central purchase contracts	You can schedule application jobs to send the outputs of central purchase contracts to the respective suppliers in the hub system.

3.7.2.4 Central Purchasing

Business Background

This scenario provides a single point of access to display and manage purchasing documents centrally. The purchasing documents include purchase requisitions and purchase orders. These documents can be created in the SAP S/4HANA system that acts as a hub system or they can be extracted from the connected systems. SAP S/4HANA, SAP S/4HANA Cloud, or SAP ERP act as connected systems. Central Purchasing provides the flexibility of connecting multiple systems across an organization and carrying out procurement processes centrally.

Key Features

The following table explains the key features available:

Key Feature	Use
Importing purchasing documents into the hub system	You can import purchasing documents from the connected systems to the hub system.
Creating purchase orders from purchase requisitions	You can create purchase orders from purchase requisitions in the connected systems.
Creating purchasing documents centrally	You can directly navigate to the connected systems to create purchase requisitions or purchase orders. You can also create a follow-on documents such as central RFQ, sourcing project, central contract hierarchy or a draft of a central contract from a purchase requisition in the hub system. You can also display central purchase requisitions that are relevant for processing in the hub system and create purchase orders based on them if necessary.
Extracting purchase orders from third party systems	You can extract purchase orders from third party systems to the hub system.
Working with purchasing documents	This feature enables you to import purchasing documents from the connected systems to the hub system and to display and manage purchasing documents centrally in the hub system, for example, by navigating into the specific purchase requisition. You can assign sources of supply to purchase requisitions, block and unblock automatic creation of the purchasing documents centrally. Furthermore, this feature enables you to navigate directly to the connected system to edit the purchasing documents and, for example, to check whether any notes are provided. You can visualize the process flow of the purchasing documents. You can refresh purchasing documents such as purchase requisitions and purchase orders in the hub system to extract the latest details of the selected purchasing documents from the connected systems. You can view the contact card details of the creator and supplier of a purchase requisition in the hub system. You can add open purchase requisitions to an existing central purchase contract in the hub system as new line items. You can view the details of a purchase order while adding purchase requisition items to an existing purchase order in the hub system. You can display and manage purchasing documents from the third party systems to the hub system. You can import history details of purchase orders in the hub system.

Key Feature	Use
Working with purchase requisition items	You can defer a purchase requisition item for a specific period. You can also resume the deferred purchase requisition items and close the purchase requisition items . You can add open purchase requisition items to an existing purchase order in the hub system as new line items. You can default the material group and material number while adding purchase requisition items to an existing central purchase contract, or to central purchase orders, in the hub system. You can reassign a purchasing group to purchase requisition items to facilitate the transfer of workload from one purchasing group to other based on personnel availability.
Displaying attributes of purchasing documents	You can search, and display the attributes of purchase requistions and purchase orders, based on the unified key mapping.
Approving purchasing documents	You can use the automatic, one-step or multistep approval process to approve centrally managed purchase orders and purchase requisitions. You can define the deadline by which the workflow step should be completed, beyond which an overdue notification is sent to the approver. You can edit the purchase requisitions in the connected systems that were submitted for approval before approving them. You can view the approval details, such as the processors involved and status, for the replicated purchase requisitions in the hub system.
Situation handling	You can use this feature to enable system notifications about purchase order items that were not delivered by the delivery date confirmed by the supplier.
Monitoring purchase requisition replication and text extraction jobs	You can monitor the extraction jobs for texts that have failed. You can monitor replication of central purchase requisitions and react if errors occurred during this process.
Managing rules for automation of business processes	You can create and delete rules that are required to automate various business processes in the hub system. You can schedule jobs for the automation of business processes based on the activated rules and monitor business process details.
Monitoring the connected systems	You can monitor the connected systems, their status (online or offline), and when their status was last checked.
Working with outputs for centrally managed purchase orders	You can schedule application jobs to send the outputs for centrally managed purchase orders to the respective suppliers in the hub system. You can manage and view the output details for centrally managed purchase orders in the hub system.
Displaying the automation status for centrally managed purchase requisitions	You can view the automation status for the centrally managed purchase requisitions in the hub system.
Resetting automation status for centrally managed purchase requisitions	You can reset automation status during extraction of purchase requisitions in the hub system.

Key Feature	Use
Adding purchase requisitions to an existing sourcing project	Central purchasers can add purchase requisitions to an existing sourcing project in the hub system.
Using the enterprise search for purchasing documents	Central Purchasers can use the enterprise search to search for centrally managed purchase requisitions.

3.7.2.5 Central Purchasing Analytics

Business Background

Central Purchasing Analytics provides users with centralized analyses and the necessary capabilities to better understand the procurement areas – both on a holistic level and on a more fine-granular level relating to connected systems. You can analyze the consumption of central contracts across entire organizations, as well as identify where global contracts are not being properly utilized. Additionally, monitoring the global purchasing spend using drill-down capabilities pinpoints the spend volume across the entire organization.

Key Features

The following table explains the key features available:

Key Feature	Use
Analyzing central purchase contracts	You can display central purchase contracts and analyze their consumption, for example by supplier or by connected purchasing organization.
Analyzing global purchasing spend	You can display purchase orders centrally and analyze the purchase order net amount and planned spend by schedule line or supplier, for example. The purchase orders can be those created in the hub system, and the ones that were extracted from the connected systems.
Analyzing central purchase requisition item types	You can view and analyze central purchase requisition item types.

Key Feature	Use
Monitoring items in purchasing documents centrally	You can monitor the release history of central purchase contract items, and display the items and distribution lines with the highest con sumption. You can monitor items in purchase requisitions and purchase orders centrally based on various filter criteria. You can also use the visual filter to display data for items in purchase orders and, purchase requisitions.

3.7.3 Operational Procurement

3.7.4 Integration with External Procurement Systems

Business Background

SAP S/4HANA supports the integration with external procurement systems (SAP Ariba and SAP Fieldglass, for example). By combining the advantages of the external system with the integrated business processes and data transparency provided by SAP S/4HANA, SAP provides an optimized portfolio for the procurement of materials and services and for the recruiting of temporary and contingent workers.

Key Features

If an external procurement system (SAP Ariba and/or SAP Fieldglass, for example) is integrated and supports the features listed below, SAP S/4HANA enables you to use the following key features:

Sourcing and Contract Management

Key Feature	Use
Creation of purchase contracts and/or purchase scheduling agreements initiated from the external procurement system	Contract documents that are created in an external procurement system can initiate the creation of a corresponding purchase contracts and/or purchase scheduling agreements in SAP S/4HANA.
Release of the purchase contract and/or purchase scheduling agreement	When the purchase contract is released as a source of supply and/or the purchase scheduling agreement as a delivery schedule in SAP S/4HANA, the status change can be transferred to the external procurement system.

Operational Procurement

Key Feature	Use
Creation of purchase requisitions initiated from the external procurement system	Requisitions for materials or services that employees create in the external procurement system can initiate the creation of corresponding purchase requisitions in SAP S/4HANA. In integration scenarios with SAP Fieldglass, lean services are currently supported. Follow-on documents, such as reservations, purchase orders, goods receipts, service entry sheets (depending on the scenario), and invoices can be created in SAP S/4HANA. Processing of a requisition in the external system can equally initiate an update of the purchase requisition.
Creation of reservations, purchase orders, goods receipts, and service entry sheets initiated from the external procurement system	The creation or processing of procurement documents in the external procurement system can initiate the creation or update of reservations, purchase orders, goods receipts, and service entry sheets (depending on the scenario) in SAP S/4HANA.
Transparency of procurement documents in SAP S/4HANA	The numbers of SAP S/4HANA purchase requisitions, reservations, purchase orders, and follow-on documents can be transferred to the external procurement system to be displayed to the employees who created the requisitions.

Invoice Management

Key Feature	Use
Creation of supplier invoices initiated from the external procurement system	The creation or processing of invoice documents in the external procurement system can initiate the creation or update of supplier invoices in SAP S/4HANA. Here, the supplier invoices are made available to accounts payable to be used in follow-on processes.
Transparency of procurement documents in SAP S/4HANA	The numbers of the invoices created in SAP S/4HANA can be transferred to the external procurement system to provide transparency to the users who created the original documents.

3.7.5 Integration of Central Procurement with External Procurement System

Business Background

SAP S/4HANA supports the integration of Central Procurement with an external procurement system (for example, SAP Ariba) to combine the advantages of the integrated product with the advantages of a scenario where your professional purchasers can either operate centrally in SAP S/4HANA (acting as a hub system) or directly in the connected systems.

Key Features

If an external procurement system (for example, SAP Ariba) is integrated and supports the required functions, SAP S/4HANA enables you to use the following key features:

Key Feature	Use
Validation of requisitions created in the external procurement system and creation of purchase requisitions	Requests that employees create in the external procurement system are validated against the respective connected system in the Central Procurement landscape before they are created in SAP S/4HANA (acting as a hub system) and then forwarded to the connected system.
Approval process	The approval step for requisitions created in the external procurement system can be performed in SAP S/4HANA (acting as a hub system).
Transparency of documents in SAP S/4HANA	The numbers of the purchase requisitions created in SAP S/4HANA (acting as the hub system) and of the follow-on documents (purchase orders, goods receipts, invoices) created in the connected systems are transferred to the external procurement system to provide transparency to the employees who created the original requisitions.
Creation of central purchase contracts or purchase orders based on awards from the external procurement system	Bidding and awarding for materials can take place in the external procurement system (for example, SAP Ariba Sourcing). For bids that have been awarded in the external procurement system, central supplier quotations and central purchase contracts or purchase orders are automatically created in SAP S/4HANA (acting as a hub system) or in the connected systems.
Creation of purchase contracts initiated from an external procurement system through the Central Procurement hub system	Contracts created in the external procurement system (for example, SAP Ariba) initiate the creation of a central purchase contract in the Central Procurement landscape, that is, SAP S/4HANA (acting as a hub system). Once the central purchase contract is released and approved, purchase contracts are in turn created in the corresponding connected systems. When the central purchase contract is approved in SAP S/4HANA, this status change can be transferred to SAP Ariba.

3.7.6 Product Sourcing

3.7.6.1 Product Sourcing

Business Background

Product sourcing enables you to identify high-quality suppliers of direct materials and services from anywhere in the world and optimize the sourcing process. Product sourcing enables you to identify the best suppliers for your product, to negotiate the best price, and order the desired goods and materials.

Key Features

The following table explains the key features available:

Key Feature	Use
Managing sourcing projects and supplier quotations	With this feature, you can run a sourcing process for materials and services that you need. Sourcing projects enable you to submit requests for supply of materials and services to potential and existing suppliers and bidders and allow you to keep track of a variety of aspects related to the sourcing process. The suppliers and bidders can provide information in the form of supplier quotations. You can create and maintain sourcing projects and you can maintain supplier quotations on behalf of suppliers or work with simulated quotations. Within a sourcing project you can use lists of preferred suppliers, start quotation comparisons, create awarding scenarios, maintain legal transactions, and start negotiations. You can inform specific members in your purchasing organization about approaching deadlines such as submission deadline for a sourcing project or negotiation end date. You can also inform them about a newly created supplier quotation or that just a low number of supplier quotations was received.
Managing awarding scenarios	Awarding scenarios enable you to simulate possible options for accepting supplier quotations in a sourcing process. They are created in sourcing projects based on a selection of supplier quotations or simulated quotations. You can maintain awarding scenarios by adding or removing quotations to see which scenario is most suitable for your sourcing project, and award one or more supplier quotations.
Comparing supplier quotations	With this feature, you can compare several supplier quotations from different suppliers belonging to a single sourcing project. You can use this feature to get an overview of all the quotations for a selected sourcing project, compare different quotations from multiple suppliers for that sourcing project, or compare different versions of a supplier quotation.
Managing procurement projects	A procurement project is used to plan for the product demand of a plant. With this feature, you can plan and manage the product demand by assigning the necessary plants to a procurement project and specifying the start and end dates for production.
Managing supplier lists	A supplier list includes the list of suppliers that your company advises you to use during a sourcing process. Supplier lists can include preferred suppliers for specific sourcing requirements or even personal preferences, which can be shared with other users. You can inform specific members about the proposal to add new suppliers to or remove existing suppliers from an existing supplier list.

Key Feature	Use
Managing negotiations	A negotiation is a process between a purchaser and the potential suppliers to arrive at the best buying terms after the supplier has submitted a quotation in a sourcing project. You can negotiate based on price or quantity and provide revised price and quantity targets to the supplier. For completed negotiations, you can view the list of negotiations that took place for a sourcing project.
Approval process in product sourcing	You can use flexible workflows to set up and use approval processes for sourcing projects, awarding scenarios, and supplier lists for sourcing. With this feature, you can assign recipients to workflow items to help you ensure that the mentioned documents in the approval process are rejected, reworked, or approved, as needed.

3.7.7 Integration with External Procurement Planning Systems

Business Background

SAP S/4HANA supports the integration with an external procurement planning system (currently SAP S/4HANA for procurement planning) to plan the sourcing of items from an early stage. This allows you to ensure timely procurement before the manufacturing process starts, to optimize the project planning, and to reduce costs.

Key Features

If an external procurement planning system (for example, SAP S/4HANA for procurement planning) is integrated and supports the required functions, SAP S/4HANA enables you to use the following key features:

Key Feature	Use
Data exchange	You can exchange scheduling data, item data, and investment-related data with the external procurement planning system.
Creation of sourcing projects	Based on the transferred data from the external procurement planning system, new sourcing projects are created in SAP S/4HANA. You can then maintain these sourcing projects and source the respective items.

3.8 Supply Chain

3.8.1 Advanced Transportation Management

Business Background

Advanced Transportation Management (TM) in SAP S/4HANA supports the entire transportation chain. You can manage the transportation demands by planning, optimizing, tendering, subcontracting, and settlement of freight processes. Also, you can book carriers in accordance with the requirements of international trade and hazardous goods.

TM supports the following end-to-end processes:

- Domestic and international transportation
- Inbound and outbound freight management based on sales orders, purchase orders, MM scheduling agreements, deliveries, stock transport orders, and returns
- Embedded analytics and key performance indicators for real-time performance visibility

Key Features

Main key features are for example:

- Order-based transportation planning with subsequent creation of deliveries based on the transportation plan
- Consolidation of inbound and outbound transportation demand in one freight order or freight booking
- Automatic planning (optimization)
- Enhanced functionality for air and ocean freight management

The following table explains the key features available:

Key Feature	Use
Master data and transportation network	You can create and use central master data such as business partners and products for transportation-related processes. In addition, you can use transportation-specific data to set up your transportation network, for example, locations, transportation lanes, and default routes.

Key Feature	Use
Agreement management	You can use agreements in TM. An agreement is a contract between business partners that details their commitment to conduct business with each other in an agreed manner. It includes contractual data, such as the following: • Organizational unit, for example, the purchasing organization • Involved parties, for example, the ordering party or carrier • Terms of payment • Validity dates Agreement management is integrated with charge management in TM. TM calculates transportation charges based on the master data stored in calculation sheets, rate tables, and scales that are created locally or that are created independently of the agreement.
Strategic freight management	To support your freight agreement negotiations, you can use strategic freight procurement. It helps you to negotiate rates with carriers to transport cargo between specific locations (trade lanes) and agree on a contract (agreement) with the carriers. TM provides the tools that you need to request rate quotations, evaluate responses, and award the transportation business to carriers.
Charge management	You can use charge management to set up the master data that the system uses to calculate transportation charges. You can calculate the charges for transporting goods between locations based on the rates you maintain in a rate table or a local rate table. The system uses master data, such as agreements, calculation sheets, local calculation sheets, rate tables, and local rate tables when calculating transportation charges.
Forwarding order management	You can use forwarding order management to create, edit, and confirm forwarding orders from your ordering parties. You can also already specify the route and have the transportation charges calculated here. The orders then form the basis for transportation planning. In addition to creating the forwarding order, you can also enter the data as a forwarding quotation and send it to the ordering party. You can then create a forwarding order based on the forwarding quotation.
Logistics integration	In the integrated logistics process within SAP S/4HANA, the following applies: • TM uses sales orders, purchase orders, returns, stock transport orders, MM scheduling agreements, and inbound or outbound deliveries to create freight units. • Logistics integration allows you to continuously react to changes of original documents that occur in the system. • In order-based planning, TM creates the deliveries based on the transportation plan taking into account dates, times, and quantities etc. For more information about logistics integration in a side-by-side scenario with another SAP S/4HANA or SAP ERP system, see section **Integration** below.

Key Feature	Use
Freight order management	In freight order management, you can create and edit freight documents (for example, freight orders, consignment orders, and freight bookings). These documents contain information required for transportation planning and execution, such as source and destination locations, dates or times, product information, and resources used. You can create freight documents directly or in transportation planning. For example, you can assign freight units to freight orders and have the system calculate the transportation charges. You can perform carrier selection, assign the freight orders directly to a carrier as a suborder, or perform tendering.
Tendering	You can use this process to send out freight requests for quotation (freight RFQs) to one or more carriers according to a tendering plan. You can use a freight RFQ tendering process to send out one or more freight RFQs. You can send the freight RFQs manually, or enable the system to send them out automatically. You can also use a direct tendering process to send a road freight order (road FO) directly to a specified carrier without creating a freight RFQ. Carriers can confirm or reject the road FOs. Unlike the freight RFQ process, the system generally awards a carrier if he or she does not reject the road FO within a given time limit. Direct tendering can be created and started manually by the user or automatically by the system. Furthermore, you can use freight bookings to book freight space in advance, for example, with a shipping company. You can then perform the execution on these documents.

Key Feature	Use
Planning	In planning, freight units are created on the basis of logistics business documents. Then, capacities can be assigned to these freight units. Furthermore, various constraints can be taken into account, for example, requested delivery dates. Finally, freight orders are the result of planning. A number of profiles and settings are available that you can use to perform transportation planning. You can use them to group planning-relevant settings, for example, capacities and planning costs. You can perform planning either manually or automatically. You have, for example, the following options: • Package Building Based on products and quantities of freight units, road freight orders, package units, trailer units and container units, the system determines both the packaging hierarchy and the size of the packages. Moreover, it determines whether packages can be stacked on each other. The system uses this information as an input for load planning, which determines the physical positions of packages, for example, in a truck. • Manual Planning You can manually assign freight units to capacities such as vehicle resources or equipment types. The system automatically creates freight documents (that is, freight orders or freight bookings) depending on the settings that you have configured in Customizing. You can use up-to-date technology to provide an intuitive visual or graphical user interface. For example, Gantt charts, map-based planning, and 3D load planning are available. • VSR Optimization Here the system uses advanced planning algorithms (optimization). The aim of VSR (Vehicle Scheduling and Routing) optimization is to assign freight units to capacities (for example, vehicle resources) in a cost-effective way while adhering to constraints. Furthermore, the system can determine the sequence of deliveries as well as transportation dates and times. VSR optimization generates a transportation plan consisting of planned freight orders from the optimization data (freight units and capacities). When doing this, it processes freight orders that are already available from a previous VSR optimization run or manual planning. VSR optimization inserts the freight units step-by-step into the transportation plan. Then the system modifies these initial solutions step-by-step, for example, by loading a freight unit on to another capacity or by changing the delivery sequence of a freight unit. The optimizer tries to minimize the total costs while adhering to the constraints. At the end of the planning run, VSR optimization returns the best solution found. For example, if the costs defined for not delivering a freight unit are lower than the costs for transporting the freight unit, the freight unit is not delivered. • Generation of Transportation Proposals

Key Feature	Use
	The VSR optimizer can generate a list of alternative transportation proposals. Out of this list you can choose one of the proposed alternatives for the subsequent steps. • Load Consolidation You can use this function to optimize the distribution of freight units to resources, such as trucks, containers, trailers, and railcars, and to equipment types. The system then generates the corresponding business documents: freight orders, container units, trailer units, or railcar units. • Carrier Selection You can use carrier selection to assign a suitable carrier to your subcontractable business documents (for example, freight orders) either manually or automatically. The aim is to find a carrier with the lowest costs under consideration of constraints. In manual carrier selection, you manually assign the required carrier to your business documents. A separate optimization is available for the automatic carrier selection. It takes into account the selected optimization options when determining the most cost-effective carrier for all business documents that you have selected.
Forwarding settlement	You can create a forwarding settlement document to bill a customer for the transportation services you provide to the customer. TM transfers the forwarding settlement document to Sales and Distribution (SD) and SD sends the invoice to the customer.
Freight settlement	In freight settlement, a freight order or freight booking provides the basis for the freight settlement document or a credit memo for a freight order. You use this function to trigger the verification of an invoice, which has been received from a supplier or carrier, against a freight settlement document.
Carrier collaboration	You can collaborate with your carriers during various processes in TM by giving them access to your SAP S/4HANA system to do the following: • Manage and respond to freight agreement requests for quotation (RFQs) during your strategic freight procurement process • Manage and respond to your freight RFQs, view freight quotations that they've submitted to you, and manage and respond to freight orders that you've sent them during your freight subcontracting process

Key Feature	Use
Integration	TM is integrated with the following other components in SAP S/4HANA or external products: • Side-by-side scenario with another SAP S/4HANA system or SAP ERP system You can integrate orders and deliveries from external source systems such as SAP ERP or another SAP S/4HANA system. The information that follows on external system integration functionality refers to SAP ERP but applies also to integration with another SAP S/4HANA system. You use integration of SAP ERP orders and deliveries to facilitate transportation planning and execution in TM based on orders and deliveries that are created in an SAP ERP system. The orders and deliveries are represented by transportation requirements in TM. The integration allows you to continuously react to changes to orders and deliveries that occur in the SAP ERP system. In particular, integration with SAP ERP enables you to: ○ Collectively plan transportation for all orders, across order types. ○ Perform transportation planning in TM based on SAP ERP orders, prior to delivery creation, thus enabling you to get an earlier forecast of future transportation and resource demands. ○ Perform tendering, subcontracting, and execution in TM based on SAP ERP orders prior to delivery creation. ○ Propose and create deliveries based on dates and quantities according to transportation planning results, taking into account transportation constraints such as resource availability and transportation durations. • EWM, MM-IM, and LE in SAP S/4HANA (Advanced Shipping and Receiving) The Advanced Shipping and Receiving process simplifies communication between the TM, Extended Warehouse Management (EWM), Stock Room Management (STRM), Inventory Management and Physical Inventory (MM-IM), and Logistics Execution (LE) application components embedded in SAP S/4HANA. It is an integrated, end-to-end process that allows users to send, receive, and transport products. It supports mixed and multi-warehouse scenarios within one freight order. It helps you to coordinate the inbound process steps from arrival of trucks at the gate to the final goods receipt in the warehouse as well as the outbound process steps from arrival of trucks at the gate to the final goods issue in the warehouse. Furthermore, you can combine inbound and outbound processes on the same truck. Communication is simplified by using a harmonized data model, by applying the EDIFACT standard to EDI messages, and by providing dedicated apps and expanding existing apps and RF transactions for shipping and receiving processes. With Advanced Shipping and Receiving, you can also manage communication between SAP GTS and the SAP S/4HANA components TM and EWM. The communication could be related to compliance-relevant checks, ob-

Key Feature	Use

	taining of an unloading permission, and obtaining of clearances after approval of the export declaration.
	• EWM in SAP S/4HANA and SAP EWM
	  ○ Integration Based on EWM TUs
	  You can integrate TM with EWM in SAP S/4HANA or SAP Extended Warehouse Management (SAP EWM) based on EWM transportation units (EWM TUs). TM supports a direct integration based on deliveries by using web services.
	  The TM planning results are transferred directly to EWM in SAP S/4HANA or SAP EWM. EWM TUs are automatically created in the warehouse. Together with the delivery information, these form the basis for warehouse planning and execution. Confirmations of the execution results (such as loading and quantity discrepancies) are sent directly from EWM in SAP S/4HANA or SAP EWM to TM.
	  The integration based on EWM TUs supports a shipper scenario to plan multiple warehouses on one road freight order, also known as multi-pickup and multi-drop scenario.
	  ○ Transit Warehousing
	  This process enables you to seamlessly integrate the planned flow of goods in TM and the physical flow of goods in EWM in SAP S/4HANA or SAP EWM over the entire transportation chain. The integration is based on execution documents resulting from forwarding orders. With this process you can store cargo temporarily in transit warehouses or gateways (air freight) or in container freight stations (ocean freight) until it is transported.
	• SAP GTS
	  The integration of TM with SAP Global Trade Services (SAP GTS) enables you to do the following:
	  ○ Handle customs processing for TM business documents in SAP Global Trade Services
	  ○ Perform trade compliance checks for TM business documents in SAP Global Trade Services
	  In a side-by-side scenario with another SAP S/4HANA system, TM is integrated with SAP GTS if transactional data and master data that is used therein originate from the same ERP system.
	• SAP EM
	  This function enables you to integrate TM with SAP Event Management (SAP EM) and to track and monitor events for business objects in business processes. SAP EM offers visibility processes to monitor transportation execution in connection with TM. The transportation execution visibility processes enable users in roles such as transportation dispatcher, shipper, or ordering party, to track and monitor planned events or to report an actual event. Tracking and tracing is provided for the following business document types in TM:
	  ○ Freight units

Key Feature	Use
	○ Freight orders ○ Freight bookings ○ Transportation units ○ Resources • SAP LBN TM in SAP S/4HANA is integrated with SAP Logistics Business Network (SAP LBN) based on freight orders. For example, you can tender and subcontract your planned freight using SAP LBN. In addition, event notifications can be directly sent from the carrier to TM using SAP LBN, and charges can be adapted after disputes have been resolved in SAP LBN. • SAP S/4HANA Cloud You can send freight units that have been created in SAP S/4HANA Cloud based on sales orders to TM in SAP S/4HANA for transportation planning. In this scenario, the freight units in SAP S/4HANA Cloud are replicated to TM in SAP S/4HANA. As a result of the planning, consolidated freight orders are again replicated to SAP S/4HANA Cloud. There the freight orders serve as a basis for charge calculation and freight settlement.
Dangerous goods	You can use product safety and stewardship (PS&S) services in TM to ensure the safe transportation of dangerous goods in accordance with legal regulations. Please note that for PS&S services a separate license is required.
Analytics	This function enables you to collect and combine relevant data across different operational areas to answer business-related and specific questions. By analyzing this data, you get important insights and improved transparency, which are crucial for your operational and strategic decision-making. You can use operational reporting for real-time analyses of data from TM. If you use overview pages (OVPs) and the corresponding Core Data Services (CDS), you can access the data in your live system directly. Therefore, you always have real-time data for your evaluations and you can react promptly to meet your operational daily business needs and processes. TM provides several OVPs with multiple KPIs covering areas such as quantities, execution, tendering, business share, and allocations.

3.8.2 Extended Warehouse Management

Business Background

Extended warehouse management provides tools for managing and processing material movements flexibly, to optimize warehouse processes.

Key Features

The following table explains the key features available:

Key Feature	Use
Inventory Management Optimization	You can optimize the management of product quantities in different stock categories, for example, by using slotting functions to assign the best bin type for a product that is to be put away, based on product characteristics. During slotting, extended warehouse management automatically determines a storage concept for a product, based on underlying putaway storage parameters on the basis of master data. These parameters describe the following: • The storage section in which the product is to be stored • The properties that the storage bin is to have • The putaway strategy that is to be used
Inbound Process Optimization	You can optimize the process of receiving products and putting them away in the warehouse, for example, by planning several inbound deliveries that are arriving in the same transport. You use transportation units or vehicles to group the deliveries, and perform the warehouse activities for all of the inbound deliveries in the transportation unit or vehicle at the same time. You can use the package builder to propose packaging structures when receiving products into your warehouse with a direct material document posting.
Outbound Process Optimization	You can optimize the process of picking products and sending them out of the warehouse, for example, by combining or splitting items from the outbound warehouse requests in waves. You can combine or split items into waves, on the basis of criteria such as activity area, route, or product. You can set up wave templates that use the same wave attributes for warehouse request items that fulfil the stated conditions of the template. Extended warehouse management can create waves automatically based on wave templates and data in the warehouse request. You can set extended warehouse management up to automatically release and re-release waves You can simulate wave release to identify missing products and get insights into the distribution of workload.

Key Feature	Use
Goods Distribution with Distribution Equipment	You can use distribution equipment to transport goods in a warehouse to different sections in the facility, for example, components to production supply areas (PSAs). For example, you can load components into handling units (HUs) that contain several HU positions, for example, mobile racks. Then you load the HUs onto distribution equipment. After loading, the system guides you to move the components to their respective PSAs for unloading.
Material Flow Control	You can run and control automated warehouse equipment, as follows: • Communicate with programmable logic controllers (PLCs) via telegrams to trigger movements and receive status updates • Subdivide warehouse tasks into smaller tasks and send the tasks to the PLC in step-by-step fashion • Use an enhanced putaway strategy and stock removal strategy that considers physics and limitations • Define capacity limits for communication points, conveyor segments, or resources, using pallet conveyor logic • Track, evaluate and influence the process of the material flow system • Monitor the communication between the material flow system and the programmable logic • Call up logs for exceptions using the alert monitor and link these exceptions with follow-on actions The material flow system includes the following features: • Automatic identification of HUs that are being scanned on the automatic storage retrieval facility and where scanner information is being sent to Extended Warehouse Management (EWM) via a telegram • Automatic diversion of HUs that cannot be stored because of incorrect contours, excessive weight, or unidentified HUs • Fully automatic putaway of HUs in the storage bin using any number of interim steps • Malfunctions reported by the controls taken into account • Reduction in empty traveling paths for stacker cranes through interleaving • Goods to man picking principle

Key Feature	Use
Just-In-Time (JIT) Supply to Production	Just-In-Time (JIT) is a logistics concept of providing material at the exact point in time when it is needed in the production process. Therefore, material buffers are reduced to a minimum to meet the current needs of the production line. JIT relies on streamlined processes for supply chain planning and operations. JIT supply to production allows you to keep your production line supplied with the exact quantity of production components needed, at the exact time they are needed. Stock transfer for the JIT call allows you to do the following: • Integrate with JIT calls • Manage production supply areas controlled by EWM or non-EWM storage locations • Plan and trigger pick task creation based on the JIT calls • Use waves to monitor and control your picking operations • Update the JIT call with quantities picked • Monitor the entire process and trigger changes and updates **i Note** JIT supply to production is available in EWM embedded in SAP S/4HANA only. This feature isn't available in decentralized EWM based on SAP S/4HANA.
Yard Management	The yard is where you maintain vehicles and transportation units that arrive or depart from your warehouse. You can use yard management to move transportation units from one yard bin to another inside a yard. Possible types of yard movement are as follows: • The transportation unit arrives at the checkpoint and is moved to a parking space or to the door. • You move a transportation unit from a parking space to the door, or from the door to a parking space. • You move a transportation unit in the yard from one parking space to another, or from one door to another.

Key Feature	Use
Labor Management	You can plan labor times and resources in your warehouse, by classifying, measuring, planning, and simulating the activities in your warehouse. You can compare and evaluate the performance of your warehouse employees based on engineered labor standards. You evaluate performance on an individual level or based on teams or shifts. After the work has been performed, you can compare the planned and actual times, and trigger incentives such as bonus payments using the HR system. You can use short-term operational planning match the workload with the number of employees in the warehouse. You can import or maintain time and attendance data in extended warehouse management.
Value Added Services	You can perform and document value-added services in the warehouse, such as assembling products, packing products, labeling, or kitting. You can perform value-added services in the inbound and outbound delivery processes.
Kitting	You can create kits in kit to order or kit to stock processes. The following rules apply to the kit to order process: • A kit is always delivered in full to a customer. • The kit header and the kit components are always scheduled for the same date. • All components of a kit staged in one warehouse. • The kit header and kit component have a quantity ratio – defined by the kit structure –to each other. This quantity ratio is recalculated as soon as there are changes at kit header level or at kit component level. In the kit to stock process, the following applies: • Kit to stock can be started by the system from a production order, or manually in EWM. • You can perform reverse kitting to split up a kit back into its components.

Key Feature	Use
Cross-Docking	You can create and confirm tasks to transport products or handling units from goods receipt to goods issue without putaway occurring in between. Using cross-docking enables you to fulfil urgent sales orders, or to reduce processing and storage costs. You can perform cross-docking in the following ways: • Opportunistic cross-docking Extended warehouse management can determine the cross-docking relevance of the products after they have physically arrived in the warehouse • Merchandise distribution Extended warehouse management receives inbound and outbound delivery documents from the system which contain the merchandise distribution process methods and the purchase order item. For the inbound delivery, extended warehouse management first considers all outbound deliveries that have the same reference number. In addition, extended warehouse management uses the merchandise distribution process to determine the warehouse process type, and to perform the merchandise distribution cross-docking according to Customizing.
Warehouse Billing	Warehouse billing allows you to perform the following activities with a connected SAP Transportation Management (SAP TM) system: • Record the quantity of warehouse services used for services agreed upon in an agreement in the connected SAP TM system. • Send this quantity information back to the connected SAP TM system for charge calculation and settlement based on the charges you have agreed to in the agreement. Warehouse billing allows you to perform the following activities with an embedded Transportation Management (TM): • Record and send quantity information to embedded TM for self-billing or charge calculation and settlement purposes
Cartonization Planning	You can use cartonization planning to improve the creation of shipping handling units (HUs) based on information from product master data and outbound delivery orders, such as quantities, volume, and weight. Cartonization planning results in the creation of planned shipping handling units (PSHUs) that you can use as templates for creating shipping HUs during picking or packing. You can create PSHUs manually or automatically in cartonization planning. You can create nested PSHUs for cartonization planning of deliveries where HUs are packed into larger HUs. You can plan pallets based on attributes such as weight and volume to minimize the number of pallets needed in your outbound deliveries.

Key Feature	Use
Dock Appointment Scheduling	You can plan vehicle arrivals in your warehouses efficiently, and collaborate with the parties involved in an appointment. • Planning for the Warehouse Planning of vehicle arrivals at the warehouse, and loading and unloading of the vehicles, is important for managing the efficient running of the warehouse, and for balancing the workload across the working day. You can use SAP Dock Appointment Scheduling to schedule loading appointments for loading and unloading vehicles and to get an overview of the workload of a loading point for each day. • Planning for the Carrier For a carrier, planning is important to reduce the amount of time when the vehicles are not available for use, for example, if they are waiting to be unloaded. Carriers with access to the system can plan loading appointments for their own vehicles directly in the system, and update details of their loading appointments.
Shipping and Receiving	You can use shipping and receiving to manage the following aspects of your warehouse: • Usage of vehicle and transportation units (TUs) for managing the transports to or from your warehouse • Loading and unloading, including arriving at and departing from doors • Yard management You can use the shipping cockpit to perform the following activities: • Plan TUs for a given day You can plan the TUs and assign warehouse management outbound deliveries to them. • Perform and monitor outbound deliveries using TUs With the shipping cockpit, you can monitor the status of deliveries assigned to a TU and trigger related actions for the TU or the deliveries.
Transit Warehousing	You can use transit warehousing when you are receiving or shipping cargo as part of a longer transportation chain. The cargo is not destined for your warehouse and you do not unpack or put it away in your warehouse as stock. Instead, you receive cargo and store it until it is required for transportation to the next stop in the transportation chain. The transportation of the cargo is planned in a connected SAP Transportation Management (SAP TM) system, and the plan is transferred to extended warehouse management. The warehouse processes are performed in extended warehouse management and the results are sent back to SAP TM.

Key Feature	Use
Integration with Transportation Management	You can integrate EWM and Transportation Management (TM) by using EWM transportation units (TU). This allows you to do the following: • Plan your inbound and outbound transports from TM • Receive the transportation plan from TM • Plan and execute deliveries according to the transportation plan • Communicate check-in and check-out information from extended warehouse management to TM • Communicate accurate weight, volume, and number of HUs in outbound deliveries

Key Feature	Use

Decentralized EWM	You can use a separate SAP S/4HANA system in which only EWM is active as a decentralized warehouse management system that is integrated with an SAP ERP system.
	
	Decentralized EWM works with SAP ERP in the following ways:
	
	• Master data
	  ○ With decentralized EWM, you can receive master data like material master, batch master and customer vendors from SAP ERP
	  ○ You can create batch master in the decentralized EWM system
	  ○ You can receive material values from SAP ERP
	• Inbound processing
	  ○ You can receive inbound deliveries from SAP ERP
	  ○ You can receive expected goods receipt information from purchase orders in SAP ERP
	  ○ You can receive expected goods receipt information from production orders or process orders in SAP ERP
	  ○ You can create inbound deliveries in decentralized EWM based on expected goods receipt information sent from SAP ERP
	  ○ Decentralized EWM triggers the creation of inspection lots in SAP ERP when an inbound delivery item is inspection-relevant and receives inspection lot decisions from SAP ERP
	  ○ You can inform SAP ERP about received inbound deliveries
	• Outbound processing
	  ○ You can receive information about outbound deliveries from SAP ERP to ship to customers, supply production, ship to other plants, or supply maintenance orders
	  ○ You can create ad-hoc deliveries and inform SAP ERP about the executed shipment
	  ○ You can inform SAP ERP about processed deliveries and send updates about batches and product quantities being shipped
	• Internal warehouse movements
	  ○ You can plan, create and confirm tasks for moving products to different areas inside the warehouse, for example, replenishment of products in picking bins.
	  ○ You can perform ad-hoc internal warehouse movements, using RF transactions or from the warehouse management monitor.
	  ○ You can plan, conduct and confirm regular counts of actual product quantities in the warehouse and compare the physical stock to the data in the system.
	  Following the count, you can update the stock data in if there are differences between the quantity of physical stock and the quantity in the system.
	  ○ You can receive posting changes from SAP ERP
	  ○ You can inform SAP ERP about triggered posting changes

Key Feature	Use

	• Production
	  ○ You can receive production orders or process orders from SAP ERP and store those as production material requests.
	  ○ You can inform SAP ERP about consumed quantities

3.8.3 Extended Service Parts Planning

Business Background

Extended Service Parts Planning (eSPP) provides service-parts-specific planning functions and transparency throughout the supply chain, right from the moment demand occurs through to the delivery of the product.

Key Features

The following table explains the key features available:

Key Feature	Use
Capturing and Managing Demand	You can capture and manage demand for your location products to generate a demand history. You can load sales order data from Sales and Distribution and stock transfer order data from Materials Management. The demand history forms the basis for the forecasting and for further planning processes in Extended Service Parts Planning.
Inventory Planning	You can plan the optimal stock of location products using the Planning Service Manager (PSM). The system checks, for example, whether it would be beneficial to stock or destock at a location. You can calculate the economic order quantity in combination with the safety stock for each location product. As a result, you can keep stockholding costs as low as possible and reduce ordering costs and, at the same time, ensure a high level of customer service. Inventory Planning consists of the following planning services in the PSM: • Stocking Decision Service • Destocking Decision Service • EOQ/SFT Service • ABC Classification Service It is alternatively possible to use the safety stock calculation from Integrated Business Planning for Inventory (IBP-I).

Key Feature	Use
Forecasting	You can react flexibly to changed demands and determine the best forecast model (constant model, trend model, seasonal model, sporadic model, ...) for a location product and use stability rules to prevent too rapid changes to the forecast model. You can maintain parameters efficiently and at a detailed level. Forecasting encompasses the whole life cycle of a product and considers product interchangeability. It also guarantees high automation for mass processing of location products. The forecast for active, planned location products includes the demand in the absolute number of pieces, as well as a forecast of the number of order items, and a forecast of the average demand per order item.
Distribution Requirements Planning (DRP)	You can organize replenishment planning within bills of distribution (BODs, hierarchies of locations). DRP determines the demands of all locations in your BOD, rounds them, and aggregates them along the BOD to the entry location. Based on this it creates scheduling agreement releases and purchase requisitions. You can check the planning results efficiently and get a multilevel release process as required. You can ensure that products are available on demand, and thus achieve a high level of service for your customers by using functions as stability rules, anticipated coverage, different horizons, and so on.
Deployment	With this process, you can determine the distribution of goods within a bill of distribution (BOD). Based on the current demands determined by distribution requirements planning (DRP), deployment decides how to distribute the goods and, if necessary, initiates this within the BOD. Deployment can work both in a push and in a pull mode. Goods that are not distributed by deployment stay at the parent location.
Inventory Balancing	You can balance excess and shortage at individual locations by adding them to inventory balancing areas. Inventory balancing is an optional process executed as a planning service in the Planning Service Manager. You can schedule the inventory balancing service periodically. The following triggers also lead to inventory balancing: • Supersession • Destocking • Reduction of storage space at a location • Unfulfilled pull deployment requisition • Increased demand within the limited freeze horizon

Key Feature	Use
Analytics	You can analyze eSPP information in SAP Analytics Cloud (SAC). Available data categories for eSPP analytics are: • Raw Demand • Demand History • Forecasting • DRP
Side-by-side Deployment	With the SAP S/4HANA Extended Service Parts Planning (eSPP) capability of SAP Digital Supply Chain Management, edition for SAP S/4HANA, you can deploy an SAP S/4HANA system in which you use the eSPP side-by-side with one SAP S/4HANA or SAP ERP system with harmonized master data that you use for other ERP components. The SAP S/4HANA system that you use for eSPP is connected to the ERP systems via Core Interface (CIF). Master data is integrated from the ERP systems to the eSPP system, transactional data is exchanged bidirectionally. The integration is controlled via integration models that are created and activated in the ERP systems.

3.8.4 Advanced Order Promising

3.8.4.1 Advanced Available to Promise

Business Background

Internal sales representatives, order fulfillment managers, and order fulfillment specialists require mechanisms to configure, execute, and monitor availability checks and optimize the distribution of supply. This is particularly important when the availability of materials needed to confirm requirements is limited. You can use the advanced available-to-promise (aATP) capabilities to confirm on which date and in which quantity a requirement can be fulfilled.

Key Features

The following features are available:

Key Feature	Use
Product Availability Check	You can use this feature to determine on which date and in which quantity a requirement can be confirmed, based on a specified checking rule and the current supply situation for a specific material. The availability check takes concurrent requirements of differing types and their respective confirmation situation into consideration.
Product Allocation	You can use this feature to allocate material quantities for a specific time period and to a combination of characteristic values for sales orders, stock transport orders, and scheduling agreements without delivery schedules, against which availability checks can be run. You can monitor the product allocation situation for product allocation objects, allocation periods, characteristic value combinations, and order items during a specific time period. Using the displayed data, you can take action to optimize the overall product allocation situation. Furthermore, you can display aged product allocation data.
Backorder Processing	You can use this feature to re-prioritize sales orders and stock transport orders and perform automated mass availability checks to ensure that a limited supply of material is distributed in accordance with a specific strategy. Optionally, your system assigns specific supply elements to the individual requirements. You can monitor the check results and, if necessary, re-run the check to improve the confirmations for the requirements.
Release for Delivery	You can use this feature to manually re-prioritize due sales orders and stock transport orders to ensure that a limited supply of material is distributed in accordance with a dedicated strategy and available supply. After re-prioritization, you can trigger subsequent logistics processes.

Key Feature	Use
Alternative-Based Confirmation	When creating and changing sales orders, you can use this feature to replace the originally requested delivering plant, storage location, or product for a requirement with a substitute delivering plant, storage location, or product: • Substitution is executed inline and at subitem level for delivering plants. • Substitution is executed at subitem level only for storage locations and products. Furthermore, you can define the subitem to which open remaining quantity is to be assigned when a full confirmation cannot be generated and, to enable the generation of a confirmation, you can define a numeric relationship for converting requested product quantities into substituting product quantities dynamically. Substitutes and, where relevant, numeric relationship data for quantity conversion are displayed during sales order processing and in the results of backorder processing runs. You can also prioritize the determination of substitutes based on different combinations of characteristic values for sales orders.
Supply Protection	You can use this feature to plan quantities for defined protection groups that cannot be consumed by less important demand elements (sales orders, stock transport orders, and so on). The availability check considers the quantities protected by supply protection and virtually reduces the available quantity for demand elements not matching with the protection group of a supply protection object. Demand elements matching with a protection group will not have to respect these restrictions.

3.9 Enterprise Technology

3.9.1 Digital Assistance

Business Background

SAP S/4HANA supports the integration with a digital assistant (for example, SAP CoPilot or SAP Conversational AI) to allow users to get their work done more efficiently.

Key Features

When a digital assistant (for example, SAP CoPilot or SAP Conversational AI) is integrated and supports the features named below, SAP S/4HANA enables the digital assistant to provide the following key features:

Key Feature	Use
In-Context Chat	The integration with the digital assistant enables you to exchange real-time information with your co-workers including notes, screenshots, and business or application data with the relevant business object context of the user.
Quick Create	For selected use cases users can create business objects directly using the digital assistant.

3.9.2 Geographical Enablement Framework

Business Background

Map-driven user experiences are ubiquitous, and they are enabled through mobile devices with built-in GPS receivers. Whereas consumers are quite satisfied by easily locating places and checking for directions, requirements in asset intensive industries such as Utilities, Oil & Gas, Mining, Public Services, and Transportation/Rail go far beyond simple use cases. Existing GIS (geographic information system) solutions that maintain multiple layers of map information, visualization of linear assets, and objects represented by polygons (example: a certain area of land) need to be merged with their related business processes and reflected in SAP solutions.

Key Features

The SAP Geographical Enablement Framework works as the foundation to extend business data with spatial attributes for SAP S/4HANA functions. As a framework that enhances the spatial capabilities inherent in SAP HANA, it enables organizations to develop geo-spatially enriched business data and make them accessible from within SAP S/4HANA functions, as well as external GIS systems. The framework is being delivered with a standalone Geometry Explorer, Geometry Editor, and a template for the Business Partner business object as an example for spatially enabling other business objects. Please note that you might need a separate license.

The following table explains the key features available:

Key Feature	Use
Geometry Explorer	The framework provides a standalone web-based Geometry Explorer. It allows the end user to view both business data from SAP S/4HANA functions and engineering data from GIS systems on the same map to obtain better insights. It also allows the end user to access multiple SAP S/4HANA functions directly from the map to improve efficiency.
Geometry Editor	The framework provides a standalone web-based Geometry Editor. It allows the end user to search, view, and update geometries for any geo-enabled SAP business object.
External Connectivity	Framework exposes the geometries and attributes of geo-enabled SAP business objects as feature classes, to be consumed using standard GIS tools.
Framework Development Technology	The framework provides APIs for application development; it also provides geometry-buffering functionality for synchronization with the embedded map user interface, while updating geometry and application data concurrently.

3.9.3 Enterprise Contract Management

Enterprise Contract Management provides a suite of applications designed for the creation and the management of legal content in enterprises that can be integrated into all core business processes and stores all types of documents in a single repository.

Legal content is produced because of various business scenarios in a company, such as procurement processes or sales and distribution as well as policies or inter-company agreements. Enterprise Contract Management provides a central repository and single source of truth for all legal documents, such as contracts, policies, and non-disclosure agreements.

3.9.3.1 Integration with SAP Enterprise Contract Assembly

Business Background

SAP S/4HANA supports integration with SAP Enterprise Contract Assembly to enable you to create and manage legal content that is generated out of various business scenarios in a company, such as procurement processes, sales, policies or inter-company agreements.

Key Features

The following table explains the key features available:

Key Feature	Use
Generating PDF File	You can generate a PDF file after processing the legal document either manually or while assembling the virtual document.
Assembling document from Template	You can assemble a virtual document from a template.
Discarding Content	You can delete all the assembled content from a legal document, without deleting the document itself.
Editing Content	You can edit the content in a virtual document.
Generating Word File	You can generate a word file to edit the document offline.
Viewing Content Statuses	You can view the content export and content assembly status.
Restoring Virtual Documents	You can restore an existing version of a virtual document.

3.9.3.2 Enterprise Contract Management Overview

Business Background

Enterprise Contract Management Overview analyzes the most important legal transactions, contexts, and documents that you need to process. The graphical representation of the most critical tasks summarizes key information from the underlying apps that you are working on, so that you can analyze and identify upcoming important dates, reminders, and transactions and take quicker decisions. There are various actionable cards showing vital information ranked as per their expiration, risk or health.

Key Features

The following table explains the key features available:

Key Feature	Use
Monitoring tasks	Monitoring tasks help you to immediately process critical tasks in your transactions. You can, for example, monitor the following aspects: • Total number of tasks to be processed by you • Pending and important tasks to be processed by you • Average processing time taken for task completion • Total number of completed tasks
Monitoring transactions	Monitoring transactions helps you to immediately assess and resolve critical situations for your company. You can, for example, monitor the following aspects: • Total number of transactions • Health status of transactions • Transactions at risk
Monitoring contexts	Monitoring contexts helps you to provide the required information for a business scenario. You can, for example, monitor the following aspects: • Total number of contexts • Status of contexts • Contexts about to expire
Monitoring documents	Monitoring legal documents helps you to optimize the process of creating and finalizing legal documents. You can, for example, monitor the following aspects: • Average time taken to create and process legal documents • Total number of legal documents • Status of legal documents • Signed and acceptance status of legal documents • Status of document stamps
Upcoming reminders and dates	You can view the upcoming reminders and dates of the legal transactions and plan your tasks accordingly.
Navigating to related apps	From the monitoring apps, you can navigate to related apps to trigger follow-on actions (you can, for example, change the health status of a transaction or change the status of a context about to expire). You can also navigate to the object page of an individual item.

Key Feature	Use
Filtering	You can filter the content of cards by various criteria, such as context, legal transactions, and main entity. This enables you to make informed decisions and take immediate action.
Sorting of objects	Objects are sorted according to their status, creation date, or validity dates. For example, contexts that are soon to expire are sorted by their status and valid to date.

3.9.3.3 Managing Categories

Business Background

Categories classify business objects such as contexts and legal transactions. You can use categories to classify legal content. Legal content is created by or exchanged between legal departments. Based on the categories that are assigned to the legal content business objects, the legal content can be classified.

Key Features

The following table explains the key features available:

Key Feature	Use
Classifying legal documents	You can create specific categories to classify legal documents.
Generating categories	You can generate categories using custom data source.
Adding descriptions about categories	You can add a detailed description about a category, if required. For example, you can provide some background or additional information about the category.
Exporting and Importing category names	You can export and import category names to perform for example, a mass translation.
Adding descriptions about categories	You can add a detailed description about a category, if required. For example, you can provide some background or additional information about the category.You can translate category names or add new translated category names by exporting and importing category names.

3.9.3.4 Managing Contexts

Business Background

Contexts form the foundation of a legal transaction and can predefine settings for legal transactions that support a more standardized processing. You can define contexts to cover a business scenario or circumstance, thus laying a foundation for how a legal transaction must be processed and what information must be provided.

Key Features

The following table explains the key features available:

Key Feature	Use
Defining additional entities	You can define business partner entities to support your business process.
Viewing linked object type	You can view the linked object and use the link to the navigate.
Determining contexts	You can determine an integration relevant context.
Defining custom step	You can define custom steps in a workflow.
Defining phases	You can define phases to monitor various factors responsible for a successful completion of legal transaction. For example, you can define a phase to ensure all the necessary legal documents with appropriate stamps are attached to the legal transaction. You can even define a phase to start automatically once the previous phase has ended.
Copying tasks to new version	You can copy tasks to a new version of the context, even if the source context is in draft status.
Renewing and terminating transactions	You can predefine the renewal and termination clauses for legal transactions. You can also select the corresponding date types for renewal and termination of legal transactions.
Predefining task group step attributes	You can predefine the recipients, preconditions, and exception handler attributes for task group steps.
Predefining relationships	You can predefine relationship between multiple legal transactions. For example, defining a legal transaction for a request for quotation to a supplier as related to the legal transaction for the purchase order.
Restricting access	You can restrict accessibility of legal transaction by using access level. You can filter access to the legal transactions through main organization elements like purchase organization, sales organization, and company code.

Key Feature	Use
Creating task group for context	You can create default task group templates that are mandatory for each legal transaction using this context.
Restricting access	You can restrict access to legal transactions by using access level. You can also filter access to the legal transactions through main organization elements like purchase organization, sales organization, and company code.
Adding task group templates for context	You can add task group templates that will be defaulted for each legal transaction that is based on this context.
Predefining language	You can predefine the language of a legal transaction.
Predefining governing law	You can predefine the law of a region and country, relevant for a contract or any legal content. For example, every contract must abide by the laws of a region and country. You can define the governing law in the context to ensure the legal transactions follow the same governing law.
Extensibility	You can add custom fields to the legal document header.
Defining documents	You can define legal documents that have to be included in the legal transactions and mark the required documents.
Adding descriptions about contexts	You can add a detailed description about the context, if required. For example, you can add some background or additional information about the context.
Archiving objects	You can archive objects that have reached the end of retention period.

3.9.3.5 Requesting Legal Contract

Business Background

You can submit a request for legal contract. You are guided through a process of providing required information for a specific business scenario. Based on this information, the system creates a legal transaction that is then used by the responsible teams, for example, Legal or Commercial, Compliance, Procurement to create the legal content and to manage the lifecycle of legal content as part of a business transaction or a business scenario.

Key Features

The following table explains the key features available:

Key Feature	Use
Using custom fields	You can use the custom fields and implement field control.
Searching for contexts	You can search for specific contexts by using the description of the contexts.
Creating from Template	You can create a virtual document from a template for legal content.
Predefining language	You can predefine the language of a legal transaction.
Predefining governing law	You can predefine the law of a region and country, relevant for a contract or any legal content. For example, every contract must abide by the laws of a region and country. You can define the governing law while requesting for legal content.
Predefining documents	You can predefine legal documents that have to be included in the legal transactions and mark the required documents.
Uploading attachments	You can add attachments to the request for legal content.
Adding descriptions	You can add a detailed description about the legal content object, if required. For example, you can provide some background or additional information about the legal content object in this field.

3.9.3.6 Managing Legal Transactions

Business Background

Legal transactions are created based on a legal content request and is used to manage the legal content through its lifecycle. For this, the legal transaction collects all the information and material that is connected with the legal content: the parties involved in the creation of the legal content internally as well as externally, the deadlines that need to be observed, the tasks that need to be completed, and the documents that need to be generated in the process or are linked to the legal transaction.

Key Features

The following table explains the key features available:

Key Feature	Use
Creating and updating legal transactions through product sourcing	You can create and update legal transactions and view all the important documents of product sourcing.
Defining additional entities	You can define business partner entities to support your business process.
Updating and reassembling virtual documents	You can update and reassemble virtual documents to update the modified variables.
Viewing legal document log	In the legal transaction log, you can view when a legal document was created.
Managing and tracking obligations	You can manage and track obligations related to documents in the legal transactions, to ensure legal compliance and risk mitigation.
Managing phases	You can start one or more phases to monitor various factors responsible for successful completion of legal transaction. You can even view if a phase is defined to start automatically after the completion of the previous phase.
Adding document reference number	You can add a reference number to the legal document.
Creating document from template	You can assemble virtual documents using templates that are created from an external system.
Situation handling	When you have not processed a failed health status synchronization task within a stipulated period, the system sends you a notification reminding you about this pending task.
Viewing open issues	You can view open issues that affect the health of a transaction.
Creating with reference	You can create a copy of a legal transaction by defining a relationship with its source transaction and selecting the required header attributes and facets. Defining a relationship provides traceability between the source and reference transactions. For example, you want to use the source transaction as a reference and copy only the required header attributes and facets from this transaction. You can use this reference transaction as a template to define other header attributes and facets, according to your business needs.
Copying tasks from legal transactions	You can copy task group templates defined in the source legal transaction to the target transaction.
Viewing comments	You can view comments that are added by the task processor.

Key Feature	Use
Copying legal transactions	You can copy legal transactions to avoid recreating a transaction with the same attributes. For example, you have created a legal transaction for a business scenario. You now want to create a transaction for a similar business scenario for a different region or product. In such cases, you can copy an existing transaction with a similar business scenario.
Renewing and terminating transactions	You can define the renewal and termination clauses for legal transactions. You can also select the corresponding date types for renewal and termination of legal transactions.
Defining task group step attributes	You can define the recipients, preconditions, and exception handler attributes for task group steps.
Defining relationships between transactions	You can define a relationship between multiple legal transactions. For example, defining a legal transaction for a request for quotation to a supplier as related to the legal transaction for the purchase order.
Restricting access	You can restrict accessibility of legal transaction by using access level. You can also filter access to the legal transactions through main organization elements like purchase organization, sales organization, and company code.
Adding and triggering task groups	You can add workflow task templates and directly trigger work items from the legal transaction.
Sending documents for e-Signature	Using the Business Add-Inn's, you can implement the e-Signature integration to send documents for e-Signature.
Defining language	You can define the language of a legal transaction.
Defining governing law	You can define the law of a region and country, relevant for a contract or legal content. For example, every legal document must abide by the laws of a region and country. When you define a governing law, all the contracts abide by this governing law.
Extensibility	You can add custom fields to the legal transaction header.
Filtering based on entities, contacts, and categories	You can use additional filtering options to search for specific legal transactions
Defining reminders	You can set reminders to send notifications to the recipient on a specific date for a specific matter.
Creating and reviewing notes	You can create and reply to notes added by other users. You can also view replies to a specific note.
Adding descriptions about legal transactions	You can add a detailed description about the legal transaction, if required. For example, you can provide some background or additional information about the legal transaction in this field.

Key Feature	Use
Setting start of retention period	You can set the start of retention period for legal transactions with a specific status, such as ‘terminated’ or ‘expired’.
Uploading documents	Using the quick upload functionality, you can add attachments to a predefined document placeholder.
Receiving notifications	You can receive notification when a workflow task for approval is rejected.
Archiving objects	You can archive objects that have reached the end of retention period.

3.9.3.7 Managing Legal Documents

Business Background

Documents are instances of legal content that is tailored to a specific transaction or activity in a certain business context. You can use legal documents that were uploaded as static files. You can download a document to edit, upload files, create versions of the documents, and manage the document attributes.

Key Features

The following table explains the key features available:

Key Feature	Use
Creating and tracking obligations	You can create and track obligations related to the documents in legal transactions, to ensure legal compliance and risk mitigation
Linking external objects	You can link legal transactions to objects from an external system.
Discarding content	You can discard the uploaded content without actually deleting the document itself.
Creating documents from template	You can assemble virtual documents using templates that are created from an external system.
Creating reference number	You can create a reference number to additional documents that are linked to the legal transaction.
Sending documents for e-Signature	Using the Business Add-Inn's, you can implement the e-Signature integration to send documents for e-Signature.
Restricting access	You can restrict accessibility by using access level.

Key Feature	Use
Specifying language of legal document	You can specify the language of a legal document.
Governing law	You can view the law of a region or country according to which a contract is to be construed or interpreted.
Extensibility	You can add custom fields to the legal document header.
Creating and reviewing notes	You can use this feature to reply to notes added by other users and view other replies to a specific note.
Adding descriptions about legal documents	You can add a detailed description about each legal document, if required. For example, you can provide some background or additional information about the legal document in this field.
Archiving objects	You can archive objects that have reached the end of the retention period.
Displaying and filtering legal document objects	You can view a list of legal documents and use the filter bar to either select a variant, or to filter the list by using the search or the individual filter fields.
Viewing the history of legal documents	You can search for a specific change in the document and alter the view settings.
Downloading files	You can download a file that was uploaded to the document object and make the necessary changes. You can then upload the latest file to the document object.
Deleting documents	You can delete a legal document, if it is not set as a mandatory document in a context.
Editing Documents	You can use the check out and check in option to edit documents.
Versioning Documents	You can maintain different versions of the documents. This helps you to track the changes made in each version of the document or to identify the latest document.
Archiving objects	You can archive objects that have reached the end of retention period.

3.9.3.8 Managing Legal Tasks

Business Background

Workflow tasks are triggered as a result of the legal transaction processing. The transaction manager or the legal counsel needs to constantly monitor various tasks to ensure timely processing of the legal transaction.

Key Features

The following table explains the key features available:

Key Feature	Use
Filtering legal tasks	You can filter the tasks based on various filter parameters. For example, you can use the task deadline parameter to filter tasks that need to be completed. before going on a vacation
Adding stamps during a workflow	You can automatically add stamps to a document during a workflow.
Accessing related legal tasks	You can easily access related legal tasks.
Navigating to legal tasks	You can navigate to the legal tasks from the legal transactions
Managing legal tasks	You can centrally manage your legal workflow tasks. You can, for example: • Centrally manage tasks linked to different legal transactions • Forward tasks to other recipients • Notify agents about pending tasks

3.10 Country/Region-Specific Features in SAP S/4HANA Enhanced LoB Functions

This section lists and explains the key features for each country/region, covering localized features and the general feature(s) for which localization extension is provided.

3.10.1 Asia-Pacific

Key Features

The following tables contain the key features for the countries in Asia-Pacific.

India

Finance

Business Area	Key Feature	Use
Finance	Electronic Way Bill (eWay Bill)	You can generate eWay bill number (EBN) as per the legal compliance in India. This solution enables you to submit invoice transaction details to the government tax portal (National Informatics Center (NIC), obtain an acknowledgement number for having thus informed, and then use this acknowledgement number as a valid document accompanying the transport vehicle.

4 SAP S/4HANA Industry-Specific LoB Functions

SAP S/4HANA Industry-Specific LoB Functions enhance core functions of SAP S/4HANA Enterprise Management to provide industry specific business benefit for your line of business (LoB). Please note that you might need a separate license. For further information, please contact your SAP Account Executive.

4.1 Consumer

4.1.1 Agriculture

4.1.1.1 Agricultural Contract Management

Business Background

Agricultural Contract Management (ACM) enables commodity traders to capture and handle a diverse range of commodity contracts throughout their lifecycles. It supports a comprehensive range of business scenarios, agricultural-specific terms and conditions, market-based pricing and processes to effectively integrate finance and inventory.

Key Features

The following table explains the key features available:

Key Feature	Use
Third Party Sales End-to-End Process	You can use this feature to execute end-to-end third party sales processes from contract creation, goods issue, contract reassignment to incremental settlement and revenue recognition.
Third Party Purchase End-to-End Process	You can use this feature to execute end-to-end third party purchase processes from contract creation, goods receipt, contract reassignment to incremental settlement and purchase realization.
Contract Tolerances	You can use this feature to define tolerances for overfill or underfill quantity that is calculated by comparing the actual delivered quantity to the planned contracted quantity.
Quality Characteristic-based Discounts and Premiums	You can use this feature to specify the quality characteristics to be measured for a commodity, the acceptable values for those characteristics, and any discounts or premiums to be applied.
Flexible Contract Assignment Framework	You can use this feature to flexibly assign and reassign loads (deliveries) to contracts without the need for canceling and rebooking documents.
Flexible Pricing	You can use this feature to flexibly price and reprice contracts based on the Commodity Pricing Engine (CPE).
Title Transfer Scenarios	You can use this feature to determine the place of title transfer (origin or destination) based on the incoterms location.
Load Data Capture	You can use this feature to capture the quality characteristics, such as weight, grade, and other logistical data for incoming and outgoing loads of agricultural commodity products. It can also generate various follow-on documents, in the background without the need for any additional user interaction.
Spot Contracts	You can use this feature to process unscheduled purchase of commodities from vendors, in case of unplanned scenarios. Different types of spot contracts, such as, Spot Immediate, Spot End of Day, and so on can be created based on individual scenarios.
Provisional and Final Settlements	You can use this feature to define the contract terms that must be fulfilled before a settlement is finalized. For provisional settlements, priced contracts are not required, while market prices can be used prior to the final settling of the contract prices.
Revenue Recognition	You can use this feature to defer realization of revenues unless certain requirements, such as title transfer and other contract terms, are fulfilled.

Key Feature	Use
Intercompany End-to-End Process	You can use this feature to execute end-to-end intercompany processes from contract creation, goods movements, contract reassignment to incremental settlement and revenue recognition.
Intracompany End-to-End Process	You can use this feature to execute end-to-end intracompany processes from contract creation, goods movements to settlement.
Commingled Stock	You can use this feature to manage third-party stocks at your locations as well as your own stocks at third party locations by tracking all deliveries, in and out of the commingled stocks with the detailed quality information. The deliveries into commingled stock can be assigned to storage agreements from which the associated information about warehouse receipt (negotiable or non-negotiable) can be captured.
Vendor Split	You can use this feature to split one load between multiple different vendors. It is supported for commingled and purchase scenarios.
Washouts	This feature allows two trading parties who have the same contract terms (such as commodity, quantity and delivery period) to mutually offset and settle the contract without any movement of goods.
Circles	You can use this feature to settle the contracts of two different counterparties, for example different legal entities (such as customer and vendor), financially without the physical delivery of goods.
Returns	You can use this feature to automatically reverse postings of sales and purchase transactions. During reversal of sales transactions, goods are returned to the owner's location, while a reversal of purchase transaction returns the goods to the vendor. Returns are possible for either the entire or partial quantity.
Position Reporting	You can use this feature to retrieve and analyze data changes in your financial and physical transactions over the course of a business day using different kinds of reports.
Mark-to-Market Reporting	You can use this feature to value the fixed contract prices against the latest market prices of a defined market exchange and a future period to calculate a gain or loss.
Stock Mark-to-Market Reporting	You can use this feature to value the inventory against the latest market prices to calculate a gain or loss.
Profit and Loss Analysis	The profit and loss (PnL) analysis enables you to utilize several reports which attribute the overall profit and loss from physical trading operations to impacting factors that are related to the commodity trading business.

Key Feature	Use
Fee Framework	This feature provides the ability to create fees as master data in the system to charge trading counterparties for various services. Several fee types, such as, characteristic fee, carry fee, Per UoM fee, and so on are supported.
Fee Framework - Separate Invoice Workcenter	You can use this feature to create a separate invoice for fees prior to the creation of commodity settlement.
Settlement - Lien Management	The feature provides the ability to capture vendor-specific liens as a master data object. When a settlement group is created, the liens serve as a grouping split criterion to ensure that all units of a group have common liens.
Weighted Average Calculation for Physical Inventory	This feature calculates the weighted average quality factor of a given discount premium quality schedule (DPQS) characteristic and gets automatically triggered for inbound processes via LDC. It also provides tools to monitor and correct the calculations performed by the system.
Contract Snapshots and Output Management	This feature allows you to capture and review changes made to a contract based on the date, time, and responsible trader for the change.
Back-to-Back Process - Sales Diversion	This feature allows you to purchase goods from a vendor and directly sell them to a customer without physical movement through an owned location. In this case, the physical movement is directly from the vendor to the customer. While in-transit, the goods can also be diverted to a customer which is different from the originally planned customer.
Document Flow Workcenter	You can use this feature to view the entire document flow of an end-to-end process, supported by various selection criteria. It also enables you to manually reverse the application, settlement, load data capture (LDC) documents, sales/purchase orders or nomination items, including automatic reversal of all follow-on documents from the workcenter.
Fee Accrual	This feature provides the ability to accrue the financial impact of pre-defined fees prior to invoicing or realization.
Contract Mass Pricing	You can use this feature to perform mass pricing, such as to set prices on existing pricing lots or to price a new quantity. You can lift and roll prices from existing pricing lots. In addition, you can cancel quantities from existing pricing lots or cancel the unpriced quantity from the contract items.
Production Services	You can use this feature to improve the quality of commodity stocks by performing services, such as drying, fumigation, and so on. Different types of production services are supported, based on the planned operations and location details.
Contract Offers	You can use this feature to create contract offers with a target strike price. A worklist is provided to support the conversion of offers into contracts.

Key Feature	Use
Freight Charges within Commodity Settlement	You can use this feature to manually enter freight within an ACM settlement unit to capture the freight responsibility per counterparty. It also supports the ability to capture the freight obligation from the load to incoterm, and incoterm to final location. The corresponding freight charges are automatically added or deducted from the settlement net amount.
Quote Contracts	You can use this feature to create non-position relevant and period restricted quote contracts. It also provides a worklist to monitor open quotes, change statuses, and create one or more contracts with a counterparty for each quote. The quotes expire by time, not by quantity.
Multiple Buy/Sell Scenarios	You can use this feature to execute multiple buy/sell scenarios while loads are in-transit on the same vehicle. It allows you to use the same nomination and load data capture for each transaction.
Unplanned Sales and Purchase Scenarios	You can use this feature to execute unplanned sales and purchase scenarios without a prior call-off or contract reference in LDC.
Daily Grain Reporting Framework	You can use this feature to report details of commodity inventories, with various details such as incoming/outgoing loads, stock on storage, unsettled/unpaid loads, and so on.
Daily Grain Reporting - Forwarding	You can use this feature to forward stock obligations to another plant of the same company without a physical stock transfer.
Credit Sales Contracts	You can use this feature to manually manage credit sales attributes in a contract. The configuration and master data along with an audit sequencing framework (as per legal requirements) are also provided.
Contract Amendments	This feature allows you to track changes made to amendment relevant fields in a contract and provide an optional amendment approval process. The amendment of a contract can trigger it to go into an awaiting amendment approval status, based on the configuration. A different responsible trader can also be tracked for each contract amendment.
Vehicle Contracts	A vehicle contract is created when the fulfillment of a trading contract is tracked by the number of executed vehicles, instead of the delivered or received quantity against the contract. Overfills and underfills per executed vehicle are automatically managed by the process.
Mass and Auto Contract Closure	You can use this feature to close single or multiple contracts either manually or automatically. The closure of a contract automatically cancels any residual quantity on the contract. Closed contracts can also be reopened, resulting in reversal of prior cancellations that were executed as part of the closure process.
Track Document Signature Status	You can use this feature to specify additional documents which need to be signed with a contract (or contract amendment). The signature status of each document can also be maintained.
Batch Split Support in Sales Scenarios	You can use this feature to specify single or multiple batches with respective quantities per Load Data Capture (LDC) event.

Key Feature	Use
Defer Payments at Settlement	This feature allows you to make the decision to defer a payment at the time of settlement. The alternate payment date and type can be manually updated on the settlement group prior to a release or defaulted using some criteria.
Net Position Reporting	You can use this feature to report the detailed position of your inventory and sales/purchase contracts split by pricing type (Flat, NFE, NBE or NPE).
Reverse Underfill and Cancellation	You can use this feature to reverse underfills and contract cancellations.
Reconciliation Report - Transactional Data vs. Risk Data	This feature allows you to reconcile logistical/risk data and correct where needed.
Prepayment Agreements Integration	You can use the following features when the integration between ACM and Prepayment Agreements is enabled: • Credit Limit Management You can use agri-specific attributes (for example, economic group, planting/pledged area details, and past harvest) as part of the credit information and perform credit limit checks against the credit information attributes. • Fee Framework You can maintain the fees (flat fees and percentage fees) associated with prepayment agreements. These prepayment-relevant fees are processed in a separate invoice and presettled, resulting in offset in the commodity settlement. • Prepayment Request Processing When the counterparty requests a prepayment, you can provide it by adding the prepayment to a nomination or a trading contract. • Prepayment Agreement Recovery in Contract Settlement You can recover the prepayment amount and the interest through commodity settlement, during which an agency business document (ABD) is created for holding the recovered amounts. You can perform the settlement of the prepayment agreement by posting the recovered prepayment amount and the interest to financial accounting.

4.1.2 Consumer Products

4.1.2.1 Last Mile Distribution for Direct Distribution

Business Background

Last Mile Distribution supports the delivery of ordered goods directly to the final points of sale, such as retail stores or mom-and-pop stores, and the planning and execution of van sales routes. This solution enables

manufacturers and suppliers of different consumer goods to coordinate all phases of the distribution process: from route preparation to route execution through to route settlement. The planning and execution of van sales routes is based on visit lists created using a visit and activity management solution. Route stock management capabilities enable effective tracking of stock availability and sales on routes.

Key Features

Key Feature	Use
Route assembly based on freight orders	Use freight orders transferred from Transportation Management (TM) for route preparation and paper-based and mobile-based route execution
Paper-based route execution	• Prepare, enable, and support route execution for delivery drivers • Print all relevant documents that need to be processed by delivery drivers
Support of mobile-based route execution (mobile scenario)	• Set up the solution to support the download of route data and configuration data to mobile devices required for delivery drivers and van sellers to record activities on these devices • Set up the solution to support the upload of data captured on routes by delivery drivers and van sellers, for example, related to products, payments, and quantities, for use in further route processing steps, such as route settlement
Route stock management	• Gain full visibility of stock during each step of route execution up to final settlement • Create goods movements that represent stock transfers automatically • Simplify the processing of batch-managed products during route execution through generic batch handling • Classify products by stock quality, for example, salable products or products with quality issues, and control the goods movements posted for these products • Support warehouse unloading processes for returns • Decouple warehouse unloading processes from final route settlement (mobile scenario only)
Visit list management	• Import visit lists and display imported visit lists • Plan and execute van sales routes based on visit lists • Use visit lists to automatically propose delivery dates for sales orders during sales order entry
Capturing of information during route execution (mobile scenario)	• Capture and upload information about collected payments, including bank deposits, during route execution or on completion of a route • Capture and upload information about products or entire deliveries transferred from one route to another to be loaded on and sold or delivered from another vehicle
Route monitoring	• Monitor the different statuses of routes throughout their entire life cycle • Monitor the transfer status of mobile data and the processing status of routes in a mobile scenario

Key Feature	Use
Route settlement	After completion of route execution: • View, change, and update customer documents • Record payments • Detect and resolve differences in products and payments during driver check-out and check-in • Settle routes manually or by scheduling a batch job • Settle stops completed during route execution before route completion, including bank deposit stops and transfer stops (intermediate settlement, mobile scenario only) • Perform final route settlement manually or by automating the process
Settlement monitoring	• Gain insights into the statuses of routes during the execution and settlement phases and take immediate action if necessary • Show an overview of all customer visits for settled routes that have uncompleted documents and navigate to these documents to take action if necessary • Track differences between planned and actual check-out quantities and between expected and actual check-in quantities • Extract route data and transfer it to a data warehouse system
Process extensibility	• Define custom scenarios for route preparation and mobile-based route execution to meet business requirements • Adapt or enrich route data that originates from Transportation Management • Enhance the route settlement process, for example, by adjusting the information in sales documents and billing documents that are created during route settlement • Enhance archiving functionality so that custom route data is also processed

4.1.3 Retail and Fashion

4.1.3.1 Retail and Fashion Foundation

4.1.3.1.1 Master Data Management

Business Background

Master data is used to support operational processes in all areas of merchandise management or the fashion business. Master data contains the most important information about sites and business partners, such as suppliers and customers, as well as about all articles.

Master data management significantly reduces the time required to perform tasks because data is proposed automatically and is based on one single source of truth. Master data objects such as assortments or different kinds of product taxonomies facilitate the daily work of different retail or fashion specialists and help processes run smoothly.

Key Features

Product Data Management

Key Feature	Use
Compact product overview	• Display product master data and context information. • Navigate directly to related business objects.

Key Feature	Use

Article maintenance	• Use the article master to store data about all individual articles that a company purchases, sells, or produces.
	• Maintain article information:
	  ○ Descriptive information such as article description or weight
	  ○ Identifying information such as Global Trade Information Numbers (GTIN)
	  ○ Available units of measurement such as piece, carton, or pallet
	• Maintain control information that determines how articles are processed in:
	  ○ Logistics
	  For example, in replenishment.
	  ○ Sales
	  For example, selling prices and validity periods.
	  ○ Purchasing
	  For example, supplier relationships and purchase conditions.
	• Display information associated with articles such as stock levels or stock values.
	• Classify and structure articles according to a product taxonomy in multiple ways.
	• Maintain specific information for different kinds of articles, such as fresh produce and clothing.
	• Collectively maintain generic articles with many variants, for example, with different colors and sizes.
	• Maintain structured articles that consist of a specific set of individual articles, such as sales sets and displays.
	• Manage logistical products, that is, manage the same article in different units of measure in a distribution center.
	  ○ Create procurement products based on a sales product in a specific unit of measure to be used for stock separation.
	  ○ Define which procurement products or sales products can be procured by sites from which internal or external supplier within a given period.
	  ○ Use logistical products in purchase order processing, stock transfer, replenishment, material requirements planning, retail allocation, and collective purchase order management.

Article reference handling and article mass maintenance	• Perform mass operations and use reference and default handling capabilities for large volumes of data involved in article maintenance.
Article discontinuation	• Exclude articles from assortments as of a certain date, for example, if specific articles are no longer to be sold or can no longer be procured. • Discontinue seasonal products, that is, discontinue large numbers of articles within a short period of time.

Key Feature	Use
Article list	• Predefine a list of articles to be used across multiple processes as selection criteria.

Product Taxonomy Management

Key Feature	Use
Article hierarchy	• Group articles in a structure such as a consumer decision tree (CDT) that reflects how consumers typically arrive at purchase decisions.
Merchandise category hierarchy	• Group articles in merchandise categories according to common properties. • Apply a hierarchical structure to merchandise categories to create a merchandise category hierarchy.
Reclassification	• Move objects such as articles, merchandise categories, and merchandise category hierarchy levels in the merchandise category hierarchy structure if necessary.

Location Management

Key Feature	Use
Compact site overview	• Display site master data and context information. • Navigate directly to related business objects.
Site maintenance	• Model an organizational unit that carries out logistical processes involving articles, such as inventory management, sales, and procurement. A site corresponds to the term location and can be either a store or a distribution center. • Enhance site master data with business partner information that is needed for a site to assume the role of a customer or a supplier in processes such as receiving, billing, and distribution.
Site classification	• Group sites to simplify the maintenance process.

Season Management

Key Feature	Use
Season management	• Use seasons for time-dependent structuring by bundling articles according to their limited product life cycle. Seasonal attributes are especially but not limited to fashion articles, for example, snow shovels are seasonal. Examples of seasons are summer, winter, and fall; however, a season can also be defined at a more detailed level, by collection or theme. • Control logistical processes, such as sales and purchasing, based on the parameters maintained for different seasons.

Value-Added-Services Management

Key Feature	Use
Value-added-services management	Manage value-added services that enhance the value, worth, functionality, or usefulness of ordered articles. Value-added services can be either articles or activities such as putting shirts on hangers, ironing, or labeling.

Global Data Synchronization

Key Feature	Use
Global data synchronization	Procure, track, and update article master data from suppliers quickly and easily to optimize master data exchange.

4.1.3.1.2 Assortment Management

Business Background

Companies strive to offer products in the right place and at the right time in order to meet consumer needs and expectations. To achieve this goal and support their retail processes, companies use assortments to model the assignments of the product mix (articles) to stores or store clusters according to aspects such as regional considerations.

Key Features

Key Feature	Use
Assortment management	• Create assortments by assigning articles and site(s) with the relevant validity periods.
Listing maintenance and analysis	• List articles as a result of maintaining assortments. The article-site-validity period combination specifies when the respective articles should be carried in the respective stores. • View current listing conditions for a product. • Simulate the listing of a product and adapt the simulation result before executing the listing. • Control logistical processes by using listings. • Analyze listings for the purpose of basic evaluations.

4.1.3.1.3 Merchandise Buying

Business Background

Retailers need to be able to source and buy merchandise and services using procurement processes and control mechanisms across the supply chain. Through effective buying processes, companies can procure goods faster and at lower cost from suppliers globally in order to:

- Contribute to the bottom line through informed negotiating, while achieving compliance and increasing automation.
- Reduce cost and react flexibly to dynamic market conditions.
- Support effective sourcing, contracts, operational buying, and management of large volumes of invoices.
- Adopt buying processes to specific merchandise and handle purchase orders efficiently and accurately.
- Increase procurement process efficiency and transparency through order consolidation.

Key Features

The following table describes how the key features available for merchandise buying can be used.

Key Feature	Use
Purchase order processing	The specific use cases in retail processes are: • Create purchase orders for single articles, generic articles together with variants, structured articles with sub-items, and full products with empties. • Provide variant quantities easily and conveniently in a variant matrix or automated by means of an appropriate distribution curve. • Review information about season assignment, value-added services, and related retail allocations and promotions.
Purchase order scheduling	• Automate purchase order scheduling at a highly granular level along the inbound supply chain by defining important intermediate steps such as Ex-factory dates and the arrival of merchandise at shipping destinations. • Communicate the scheduled dates to and receive confirmations and corrections from external partners. • Monitor progress along the inbound supply chain and perform actions in response to changes that differ to planned schedules.

Collective purchase order management	• Collect and consolidate multiple store orders into a single purchase order for external suppliers to:
	  ○ Eliminate inefficient manual procurement activities associated with large numbers of individual orders.
	  ○ Speed up supply chain processes from supplier to warehouse to retail location.
	• Combine the requirements of recipients that may exist as warehouse orders or sales orders to create a single order for a supplier (pull process).
	• Use distribution data for a collective purchase order to control and monitor the distribution of merchandise to recipients.

Perishables planning and processing	Procure and distribute a special group of merchandise called perishables that usually has a short shelf life. • Use various perishables processing ways based on the type of data you want to process. • Determine perishables requirements based on stock on-hand, existing purchase orders, and historical data. • Create and use perishables planning list for procurement and issue. • Use functions that enable to procure perishable produce quickly and conveniently.

4.1.3.1.4 Vendor-Managed Inventory

Business Background

Close collaboration between business partners along the supply chain is of major importance with regard to streamlining logistical processes and ensuring that consumers are not faced with out-of-stock situations in stores.

In a vendor-managed-inventory business model, the task of ensuring that merchandise is available in stores is handled by the suppliers or manufacturers. To enable business partners to fulfil this task to the best of their ability, retailers need to provide the necessary information, including sales and inventory data.

Key Features

The following table describes how the key features available that support replenishment collaboration can be used.

Key Feature	Use
Vendor-managed inventory	Make stock figures and sales data available to suppliers and manufacturers to support their activities with regard to material requirements planning and replenishment planning.

4.1.3.1.5 Replenishment Planning

Business Background

Companies often face the challenge of having to deliver optimum of amounts merchandise to a large number of stores on a regular basis. To achieve this, automated processes can be implemented to optimize and integrate merchandise flow across the supply chain, including processes that involve third parties. One of the methods is the pull principle: Demand originating from the recipients is bundled and procured. Replenishment is a pull process used to supply stores with merchandise on a demand-driven basis.

Key Features

Key Feature	Use
Replenishment integration with other SAP solutions	• Provide the master data and movement data required to run replenishment processes. • Use order proposals as the basis for creating purchase orders for external or internal suppliers.

4.1.3.1.6 Demand Forecasting

Business Background

Companies use planned demand data to support requirements planning methods in order to optimize stock levels across the supply chain and thereby better meet consumer needs and expectations.

Key Features

The following table describes how the key features available for demand forecasting and planning can be used.

Key Feature	Use
Distribution curve	• Define common quantity distribution ratios for variants of a generic article across variant-creating characteristics. • Use distribution curves in sales, purchasing, and demand management scenarios to distribute quantities automatically across different variants of a generic article if the quantity is provided at the level of the generic article.
Demand management	The specific use case in retail processes is to create and organize planned independent requirements for multiple articles at the same time, for example, all variants of a generic article.

4.1.3.1.7 Inventory Management

Business Background

Companies need to manage inventory, that is, the quantities and the value information for articles carried at sites need to be managed across many locations and channels. Goods movements need to be reflected in

inventory, such as an increase in inventory when a goods receipt is posted or a decrease in inventory when a goods issue for a sales transaction is posted. Physical inventory supports the processes of counting article quantities and posting the resulting adjustments. The transparency of inventory information is crucial to the success of any company with retail processes.

A sales order represents an agreement between a retailer and a customer concerning the sale and delivery of goods. Sales order fulfillment comprises the follow-on processes in the supply chain that result in the handover of merchandise to a customer and is completed by the billing process.

Key Features

The following table describes how the key features available for omnichannel inventory and order management can be used.

Key Feature	Use
Inventory management	The specific use cases in retail processes are: • Review stock for generic articles with variants. • Review stock for empties. • Review inventory values at retail price.
Goods receipt	The specific use cases in retail processes are: • Enter quantities for variants of generic articles using a matrix. • Consider tied empties, for example, bottles and crates, during goods receipt. • Optionally explode structured articles such as prepacks at goods receipt into their individual components (often used during in-store goods receipt)
Supplier consignment	The specific use cases in retail processes are: • Define the consignment control for an article for each site, for example, distribution centers and stores, independently of each another. • Automatically convert goods that are to be transferred from a site's consignment stock to a site's own stock. • Transfer goods from a consignment stock to other sites and retain the consignment stock category.
Inventory valuation	The specific use cases in retail processes are: • Enable valuation at retail price in parallel in one currency. • Decide whether changes in retail price affect margins. • Automatically valuate all goods movements at retail based on the material ledger and post physical inventory differences at retail. • Automate revaluation of inventory at retail if sales prices are recalculated for inventory management on an exact-article basis.

Key Feature	Use

Merchandise distribution	• Plan, control, and manage the flow of merchandise from suppliers to distribution centers and then on to stores or customers.
	• Carry out cross-docking in the distribution center through support of push and pull processes to move the merchandise through the warehouse more quickly, thereby reducing the costs for processing and storage.
	• Plan merchandise distribution based on:
	  ○ Retail allocation (push)
	  ○ Collective purchase orders (pull)
	• At goods receipt, automatically or manually adjust the distribution data to correspond with the quantities actually delivered and then distribute the merchandise among the recipients.

Order management	The specific use cases in retail processes are: • Create and maintain sales orders for single articles, generic articles along with variants, structured articles with sub-items and full products with empties. • Enhance the standard price calculation with a promotion pricing service to apply simple discounts and mix-and-match promotions to sales orders. • Provide variant quantities easily and conveniently in a variant matrix or automated by means of an appropriate distribution curve. • Review and change season assignments and/or value-added services.

4.1.3.2 Retail for Merchandise Management

The empowered consumer has fundamentally changed retail. Companies need to establish a digital foundation to simplify their business with a detailed understanding of their customers' needs and the capabilities that allow them to serve customers individually and seamlessly.

Companies need to respond to the increasing need to engage customers at the right moment, consistently, and across multiple sales channels and technologies. A real-time retail platform helps companies transform their business and makes new business models possible, which can in turn increase revenue, profitability, and market share.

SAP S/4HANA as a digital core helps companies to achieve these business goals.

4.1.3.2.1 Store Layout Management

Business Background

Companies strive to offer products in the right place and at the right time in order to meet consumer needs and expectations. Through well-designed store layouts, retailers aim to create a convenient and appealing shopping experience, which is further enhanced by the optimum presentation of the merchandise on shelves, racks, and other in-store display fixtures, taking into account the number of products on display. This can be executed using a third-party space management solution.

Key Features

Key Feature	Use
Layout maintenance	• Structure the assortments of a store using a layout concept as the basis for space management integration.
Space management integration	• Integrate the capabilities of a third-party space management solution and use these capabilities to optimize shelf space by determining the best place for articles on the shelves and calculating how much space to allocate to each article based on factors such as sales volume and margins.

4.1.3.2.2 Retail Price Management

Business Background

A key aspect of how retailers address the market is the price strategy. That is, sales prices are planned based on various factors such as purchasing prices and margin goals, taking into consideration what consumers are willing to pay for products in stores or through non-store channels. Once a price strategy has been defined, it needs to be implemented, for example, by making the relevant sales prices available to stores and all other sales channels.

Key Features

The following table describes how the key features available for retail price management can be used.

Key Feature	Use
Retail price planning	• Define retail sales prices for articles at the level of sales channels or sites with a validity period based on strategies such as planned markups on procurement prices. • Recalculate and maintain retail sales prices based on changes in influencing factors, such as purchase price adjustments or the need to comply with a new business strategy.
Bonus buy	• Specify sales price deals for promotional offers such as buy two, get one free, spend at least a certain amount to get a percentage off or for special sales prices or discounts when a coupon is presented.

4.1.3.2.3 Promotion Management

Business Background

Retail promotions are marketing activities targeted at consumers and used by retailers over a limited timeframe to increase customer retention and boost sales volumes.

Effective promotion planning and management allows companies with retail processes to adjust price schedules to match customer and market needs that vary with channel and location. Promotions are planned outside the digital core and are then transferred for the execution of logistical processes, for example, article quantities are handed over to procurement.

Key Features

The following table describes how the key features available for promotion planning and management can be used.

Key Feature	Use
Compact promotion overview	• Display promotion data and context information. • Navigate directly to related business objects.

Key Feature	Use

Promotion logistics	• Create a promotion or execute promotion planning requirements for participating stores to support use cases such as:
	  ○ Consumer promotions designed to promote or boost sales through price deals for consumers and/or agreements with suppliers
	  ○ Stock reduction strategies, for example, reduce stock levels of seasonal merchandise through attractive price deals
	  ○ Product launch, for example, through effective in-store presentation
	• Specify execution data such as store notifications or details for procurement.
	• Activate follow-on processes based on the promotion data for each specific use case.
	• Maintain and monitor planned and execution data of promotions.

Promotion integration	• Integrate the capabilities of a promotion planning solution to be able to execute promotions in logistical processes, such as handing over article quantities to procurement.

4.1.3.2.4 Store Merchandise and Inventory

Business Background

Solutions for store merchandise and inventory must let retail store associates and managers:

- Access product and inventory data from anywhere in stores and at any time.
- Improve productivity and accuracy.
- Enable customer service and inventory management.

Solution capabilities for store merchandise and inventory must provide comprehensive, role-based functionality that is easy to learn and use. Retail store associates and managers have real-time access to product and inventory data for all locations in the area, from desktops, laptops, and mobile devices. Companies can increase workforce efficiency, improve store performance, and increase store sales, shopper loyalty, and customer and employee satisfaction.

Key Features

Store Merchandise and Inventory

Key Feature	Use
Store assignment	• Create and view store assignments for your own user and other users.

Key Feature	Use
Store monitoring	• Monitor and analyze key KPIs of a store.
Product lookup	• Access real-time product, promotions, stock information, and bonus buys. • View style, color, or size variants of products. • Check product availability in nearby stores.
Stock adjustment	• Perform regular and reason-triggered stock counting in stores for different storage locations. • Adjust the stock of multiple products for different reasons such as shrinkage or spoilage.
Product ordering	• Order products by reviewing order proposals. • Order products ad-hoc when standing in front of the shelf.
Product and stock transfer	• Transfer products from one store to another store or from a store to a distribution center. • Pack products in separate boxes for a transfer.
Product movement	• Move products between different storage locations. • Display a list of products that are to be moved between different storage locations.
Handling of received products	• Post receiving for goods from internal and external suppliers. • Support trusted goods receipt and/or detailed goods receipt.
Stock inventory count	• Perform cycle counting and zone-based physical inventory. • View stock inventory counts for monitoring purposes and approve or initiate a recount.
Store walkthrough	• View a list of issues in the store and prevent lost sales. • Perform daily tasks such as making adjustments to stock inventory levels. • Review and modify product order proposals.
Label printing	• Print labels ad hoc, for example, if labels are missing or are damaged.
Online order fulfillment	• Pick products for online orders in retail stores. • Hand over products to customers in retail store or centralized collection point.

4.1.3.2.5 Store Connectivity

Business Background

Store connectivity includes the connection of point-of-sale (POS) or store merchandise management solutions to support the exchange of master data and transactional data.

Typically, most information about articles, prices, and promotions is maintained at the corporate headquarters and needs to be distributed to the point of sale (POS) or to store merchandise management solutions in the relevant stores. The sales and other transactions, such as financial transactions or goods movements, that are performed using the local POS or store merchandise management solution need to be transferred back to the central system and processed.

Key Features

Store Connectivity

Key Feature	Use
Assortment list	• Transfer article-related information to POS and store merchandise management solutions, including article descriptions, units of measure, and sales prices. • Use the information in assortment lists, for example, to support the planning of in-store visual inspections.
POS inbound data	• Transfer and process transactions from POS and store merchandise management solutions, such as sales, returns, goods movements, and financial postings.
POS outbound data	• Transfer information needed at POS and store merchandise management solutions in addition to article information, such as exchange rates, tax data, merchandise categories, and promotions.

4.1.3.2.6 Merchandise Allocation Execution

Business Background

Companies often face the challenge of having to deliver optimum of amounts merchandise to a large number of stores on a regular basis. To achieve this, automated processes can be implemented to optimize and integrate merchandise flow across the supply chain, including processes that involve third parties. One method is the push principle: An overall quantity of an article is distributed to the recipients according to rules, ratios, or strategies. Retail allocation is a push process whereby a retail company centrally allocates merchandise to a number of recipients, for example, stores or customers, in order for this merchandise to be distributed.

Key Features

Key Feature	Use
Compact allocation table overview	• Display allocation table data and context information. • Navigate directly to related business objects.
Merchandise allocation execution	• Create a merchandise allocation to control which stores get which merchandise in which amount and when (push process). • Define how merchandise is distributed, for example, through a third-party process such as ordering products from suppliers or through stock reduction, that is, by using existing stock, which controls further process steps in the supply chain. • Generate follow-on documents, for example, purchase orders and warehouse orders. • Move merchandise to stores. • Base merchandise allocation optionally on promotions. • Integrate the capabilities of third-party merchandise allocation planning solutions.

4.1.3.3 Fashion and Vertical Business

Fashion and Vertical Business is an integrated solution to bring together the processes of design, develop, buy and sell, both to wholesale customers and through their own retail channels.

4.1.3.3.1 Demand and Supply Segmentation

Business Background

Companies might need to separate demand from stock transport/sales orders (requirement segment) as well as the inventory within their distribution centers (stock segment) based on certain attributes and want to define which demand could be covered by which supply.

Key Features

Key Feature	Use
Demand and Supply Segmentation	• Working based on batch management within distribution centers • Categorization of product-related demand and supply based on certain characteristics, for example, quality or country/region of origin • Demand documents (sales or stock transport orders) as well as supply elements (purchase orders and stock) carry the necessary segmentation information • Segmentation strategies that support the efficient planning and fulfillment of requirements with existing or future stock through the mapping of demand segments to supply segments These strategies are applied in requirements planning, by availability check capabilities, and in supply assignment processes.

4.1.3.3.2 Supply Assignment

Business Background

Companies need to manage inventory across many channels; they often deal with constraint stock situations where the demand is higher than the supply, especially for seasonal products. Therefore, within a distribution center specific mechanisms are needed to assign supply in an appropriate manner.

Key Features

Key Feature	Use
Supply Assignment	• Working for distribution centers in conjunction with backorder processing (BOP) of Advanced ATP (aATP) • Mapping demand (sales or stock transport orders) and supply (stock and purchase orders) through automated supply assignment rules • Creating a fixed assignment between the demand (sales or stock transport orders) and supply elements (stock and purchase orders) • Release process to ensure that only meaningful quantities are delivered, by applying release rules on various levels • Provide an overview of demand and supply assignments for reporting and analysis

4.1.3.3.3 Sales Order Management and Processing

Business Background

Order management allows companies to execute, process, and monitor sales orders.

Key Features

Key Feature	Use
Order Scheduling	• Align the delivery dates across items within sales and stock transport orders • Define and apply configurable business rules to influence the scheduling logic • Support stock transport orders
Multi Ship-to Order	• Create a single multi ship-to order (MSO) for any number of ship-to customers belonging to the same sold-to customer • Use MSO templates to copy the existing ship-to customer's data for new items instead of re-entering all the ship-to data • Handle stock shortage situations by applying distribution rules to only distribute the available stock (confirmed quantity) across the relevant ship-to customers • Generate specific sales orders for each ship-to customer automatically, based on the multi ship-to order
Pack Separately – Ship Together	• Group order items (sales orders and stock transport orders) that should be shipped together based on customer business rules • Define grouping rules to reflect the customer grouping requirements • Visualize order items belonging to the same Pack Separately – Ship Together (PSST) group • Consider PSST groups within supply assignment for release checks • Consider PSST groups for outbound delivery

4.1.3.3.4 Manufacturing

Business Background

In the Fashion industry, manufacturing processes need to consider the large variance of one article, for example, in size and color. Fashion manufacturing is supporting these processes to make them more efficient.

Key Features

Key Feature	Use
Master Orders	Planned orders and production orders are created on the variant level of a generic article. To make planning and monitoring of the production more efficient, you can logically group one or more individual orders into one master order (master planned order or master production order). This allows: • Collective processing of all the grouped orders, for example, for ATP checks, order release, confirmation. • Fixed batch reservations for components of production order at master order level. • Linking of planned orders or production orders to one another over several production levels using master orders. • Analysis of critical components and calculation of the quantity to be produced from the limited available components.

4.1.4 Prepayment Agreements

Business Background

Prepayments are amounts paid by a company in advance for the goods or services that they will receive. Counterparties request a financial prepayment prior to them delivering the goods or services, of which parts are used to pay back the prepayment. Depending on the agreement details that are captured in prepayment agreements, the actual advance is negotiable. A company can participate on both sides of a prepayment. The company can disburse payment based on a fixed amount or a percentage, or as agreed upon by both parties. All prepayments are deducted from final settlements.

Key Features

The following table explains the key features available:

Key Feature	Use
Prepayment agreements processing	You use this feature to manage prepayment agreements. Prepayment agreements are a type of document that captures the terms of prepayment negotiated with the supplier of goods or services. The terms of prepayment include, for example, amount, interest to be charged, and recovery or repayment conditions. Prepayments can take the form of advances, pre-finance or barter. Once a prepayment agreement is approved, the actual prepayment is made to the supplier of goods or services.
Prepayment requests processing	You use this feature to manage prepayment requests. When the counterparty requests a prepayment, you can provide it by adding the prepayment to a planning document, for example, trading contract, purchase order or sales order.
Related documents linking	You use this feature to link prepayment agreements to related documents. Linking is required for the recovery of prepayments during the settlement process. Prepayment agreements are linked to purchase documents, such as (purchase) trading contracts and purchase orders. Barter prepayment agreements are linked to sales documents, such as (sales) trading contracts and sales orders.
Prepayment interest calculation	You use this feature to calculate the interest amounts for prepayment agreements. You can simulate the interest amount earned when a prepayment agreement is created or linked to a purchase document. The interest amount is calculated when executing recovery of the prepayment amount or checking interest accruals due for the prepayment.
Settlement and financial postings	You use this feature to perform the settlement of prepayment agreements as well as prepayment requests by posting the required details to financial accounting. During the settlement process, prepayments are settled in cash (physical cash payments or electronic methods) or cash equivalent methods (for example, providing goods or services in exchange for goods or services from the supplier). For a prepayment agreement, you can post the agency business document (ABD) or financial accounting (FI) document for an entire prepayment agreement or selected line items of the prepayment agreement. For a prepayment request, you can post the ABD or FI document once the prepayment request is released for settlement from the trading contract, purchase order or sales order.

4.2 Discrete Industries

4.2.1 Automotive

4.2.1.1 Vehicle processes for Wholesale and Retail

4.2.1.1.1 Vehicle Sales and Distribution

Business Background

Vehicle Sales and Distribution allows you to sell and deliver new and used vehicles to your business partners. The vehicles that you offer can be based on different models from various vehicle manufacturers.

Key Features

The following table explains the key features available:

Key Feature	Use
Vehicle Sales (From the Stock)	You use this feature to allocate available vehicles and sell them to your business partners. With the vehicle search option, you can search for vehicles that suit your business partner's desired configuration and properties. The vehicles that you find can be reserved for processing inquiries, quotations, or sales orders. The delivery document is used while shipping vehicles to business partners and to create billing documents for settlement. Trade-in or buy-back of used vehicles can be considered during sales.
Vehicle Procurement (To the Stock)	You use this feature to create and order vehicles with desired configurations from the vehicle manufacturer, when you plan to have these in stock. The purchase orders that you create are forwarded to the vehicle manufacturer. The vehicles are shipped, received, and posted into stock. The supplier invoice is received and verified for settlement.

Key Feature	Use
Vehicle Sales (Based on Order)	You use this feature to sell vehicles that are not yet available, to your business partners. The manufacturer produces these vehicles based on the order and the configuration that your business partner requests. Once you receive the vehicle with the requested configuration, you can perform a pre delivery inspection before distributing it to the business partner. The delivery document created is used while shipping vehicles to business partners and to create billing documents for settlement. Trade-in or buy-back of used vehicles can be considered during sales.

4.2.1.1.1.1 Vehicle Data and Master Data Replication

Business Background

This integration process supports the replication of vehicles and related master data (from Vehicle Management System, for example) to other integrated products.

Key Features

The following table explains the key features available:

Key Feature	Use
Replication of Vehicle Information and Documents	You can use this feature to replicate the following information in other integrated products: • Vehicle configuration and a few vehicle attributes • Vehicle status • Vehicle purchase order • Vehicle sales order • Incoming and outgoing invoice of vehicle
Replication of Related Vehicle Master Data	You can use this feature to replicate the following vehicle master data in other integrated products: • Vehicle location • Vehicle status with status codes • Variant class • Characteristics

Key Feature	Use
Retrieval of Data	Using OData APIs, you can retrieve vehicle details and other supporting data.

4.2.1.1.2 Vehicle Ordering and Administration

Business Background

Vehicle Ordering and Administration allows vehicle importers, wholesalers, and distributors to interact with their dealers through a web portal.

Key Features

The following table explains the key features available:

Key Feature	Use
Vehicle Sales	You use this feature to configure vehicles, create orders for vehicles, and find available vehicles that suit the desired configuration and other criteria. Once you submit an order, you can track the order status and progress using the web portal.
Processing of Spare Parts	You use this feature to order vehicle spare parts, return parts that are no longer needed, and track the order status and progress.
Processing of Warranty Claims	You use this feature to create and manage warranty claims to vehicles and vehicle parts. You can process the returns of claimed parts. Recalls from vehicle manufacturers can be displayed and can be used for claims processing.

4.2.1.1.3 Integration of Vehicle Management System with Advanced Variant Configuration

Business Background

Vehicle Management System (VMS) supports integration with advanced variant configuration.

Key Features

The following table explains the key features available:

Key Feature	Use
Choose between Variant Configuration Modes	You can opt to use the advanced variant configuration instead of the classical variant configuration, whenever required; both configurators can co-exist in the system.

4.3 Energy & Natural Resources

4.3.1 Oil & Gas

4.3.1.1 Production and Revenue Accounting

Business Background

Production and Revenue Accounting integrates production volume allocations, division order management, sales contract allocations, volume pricing and valuation, royalty/working interest owner revenue distribution, payment processing, and state and federal reporting and compliance to provide a comprehensive solution that enables Upstream Oil and Gas companies to efficiently manage their vital Revenue Accounting processes.

Key Features

The following table explains the key features available:

Key Feature	Use
Ownership	You can create the master data used throughout Production and Revenue Accounting to provide a single source for Division Order information. This module utilizes common master data sources from the business partner and joint venture accounting modules, and extends these to support Revenue Accounting functions. The ownership module supports: owner transfers, funds transfers, owner consolidations, and changes in pay status. Ownership master and transactional effective-dated data is used directly in the Revenue Accounting processes, including chain of title, gross and net revenue interest, tax and marketing exemptions, pay status, special entity types, carried owners, Blanchard scenarios, and prior period adjustments.
Production	The Production application area allocates volumes for materials such as oil or gas from custody transfer points and other points for measurement, back to the source well completions. Production master and transactional data supports effective-dating and includes a framework for managing changes affecting prior periods. Complex production scenarios can be modelled, including scenarios of: gas lift, return lease fuel, multiple streams, fuel systems, load oil, skim oil, and water chain.
Sales and Balancing	The Sales and Balancing module extends the volumetric data from the production module with associations and allocations to contracts and owners. Master data supported in this area includes maintenance of marketing relationships for sales as well as allocation rules. Upon receipt of contract sales data, an allocation of sales volumes is performed to the source well completions and to the associated owners. Actual and entitled owner volumes are derived for use in product balancing and revenue accounting. Prior period notifications and adjustments are supported. Balancing statements can be managed and made available for partners.

Key Feature	Use
Valuation/Revenue Distribution	The Valuation module allows you to derive the value-based outcomes of a network of producing entities in a sales period and to allocate these amounts to owners, posting detailed accounting entries to a common ledger. The process supports the following key functions: • Settlement diversity: where a royalty owner is valued on a different basis than the producer • Formula-based value calculations for: Actual, Entitled, and Settlement Diversity scenarios • Contract pricing based on fixed or formula schemes • Pricing formulas can reference published postings, including gravity scale adjustments • Capture of internal and external marketing rates • Calculation of supported agency taxes, including support of exempt entities, owners paid on gross, owners free of marketing costs, classification of certain entities to receive special rates • Prior period adjustments, including re-allocation of funds due to historic owner transfers • Settlement statement option for input that allows for direct entry of values into a revenue distribution • Dual accounting for US-based ONRR scenarios • Changes to key master and transactional data that can impact a closed settlement will trigger a prior-period adjustment notification, where users can later manage these notifications and take appropriate action
Check Input	You can process payments received from a third party purchaser or remitter's remittance statements into the SAP Oil and Gas system with standardized data. This process includes support for formatting and processing inbound CDEX files.

Key Feature	Use
Payment Processing	You can: • Void or un-void checks to help in the management of bank reconciliation • View or update the status of checks • Analyze the variance between the current and last payment made to an owner based on month or check • Auto-clear checks from bank upload file • View balance amount to be paid for each owner • Manage minimum pay requirements based on tolerances set by the state with the capability to override by owner • Allow state backup withholding and federal backup withholding for the US • Allow NRA withholding for foreign owners • Set additional validation using special handling codes • Check if checks are consistent across check writes by running variance reporting • Run check writes at various levels—for example, at the company level, the owner level, the DOI level, or the network level • Create CDEX outbound files for management of standard check file distribution • Hold a check for pending analysis therefore not sending a incorrect check
Account Receivable	You can manage accounts receivable balances. The accounts receivable balances are updated real time when respective Accounting Document postings take place. This function allows you to view information on current, accounting periods, and historical accounts receivable balances, create comments and categorize balances, transfer balances and write-off balances
Production Regulatory Reporting	You can produce volumetric reports based on production data. These reports are used to meet the requirements of many state and federal agencies.
Responsibility Area	You use the Responsibility Area to specify who is responsible for what on the basis of entities (like the geographic locations and venture DOI) applicable for Office of Natural Resources Revenue, Production, Payment Processing, and Accounts Receivable.

Key Feature	Use
Tax and Royalty Reporting	You can: • Manage master data relationships between State and Federal tax and royalty entities and PRA identifiers • Maintain special tax reporting relationships (for example, New Mexico suffix data) • Use a report processing engine that provides complete control of execution to from validation of master data and extraction of master data for processing to report processing and review/correction before posting of journal entries and authorization for payment • Use various reconciliation and variance reports, auto suspension of records for processing, and out of statute records management

4.3.1.2 Inventory and Movement Management

Business Background

Inventory and movement management allows you to streamline processing and tracking of all hydrocarbon movements and inventory positions. You can consistently execute and track hydrocarbon movements and inventory updates. You can capture and track inventory information and product movements; supports quantity conversions, automatic duty and tax calculations, and pricing updates; and speeds post-movement settlements, such as invoicing and freight settlement. Timely and accurate inventory information leads to better visibility, decision making, and confidence around forecasts, replenishment planning, and trading. Consistent and automated product movement processing promotes stock updates; expedites contract-to-cash and procure-to-pay cycles; and reduces reconciliation, duplication, and corrections.

4.3.1.2.1 Hydrocarbon Product Management

Business Background

Hydrocarbon Product Management (HPM) addresses Oil & Gas specific industry requirements in inventory management. It provides additional quantity fields for different units of measure HPM provides a flexible Quantity Conversion Interface (QCI) that allows the conversion of volumes, masses and energy at ambient conditions (temperature, pressure, vapor pressure, calorific value, density) into volumes, masses and energy values at standard conditions. In addition, the Quantity Conversion Interface enables the calculation of density and heating value at standard conditions and functionality for managing physical inventories in tanks via Silo management by creating tank dips, and comparing those inventories at any time with the book stocks.

Key Features

The following table explains the key features available:

Key Feature	Use
Material Master with Oil & Gas characteristics	Inventory management for Oil & Gas materials requires industry specific extensions: base unit of measure (UoM), Unit of measure group and conversion group are important additional information for an Oil & Gas material in the material master. Additional fields like Air Buoyancy factor, Excise Duty Group play an important role for Oil & Gas materials and are reflected in HPM as well.
QCI	Hydrocarbons are bulk products in liquid form that are processed and shipped in large quantities by the Oil & Gas industry. Even the smallest fluctuations in temperature can result in considerable fluctuations in volume, and as a result, to significant fluctuations in value. The oil quantity conversion enables the conversion of quantity of a hydrocarbon product into different UoMs and allows an accurate correction of volumes and density. The quantity conversion itself uses external algorithms which are accessed through the Quantity Conversion Interface (QCI). Based on QCI parameters & values, conversion from one UoM to another is possible.
Silo Management	Silo/Tank Management allows a company to record physical material stocks in tanks (silos) either hourly, daily, or weekly. As a part of that process, tank dips can be recorded. The physical stock readings (tank dip readings) can be compared at any time with book inventories (storage location stocks, batch stock, or special stock), or with changes in book inventories (goods movement records). In that way, gains and losses can always be determined and goods movements can be monitored.

4.3.1.2.2 Tariffs, Duties and Permits

Business Background

The solution calculates and posts excise duty for dutiable materials. The system calculates and posts excise duty when a goods movements occurs, based on the quantity of material moved, and the location information of the material, if required. The component covers:

- Calculation of excise duty in purchasing and sales
- Calculation of excise duty in inventory management and physical inventory (for example, excise duty calculations for material when there are goods movements between plants with different ED rates)
- Calculation of excise duty in production orders
- Calculation and posting of excise duty liabilities and claims for goods movements of dutiable material
- Split inventory management of the ED portion and net price of a material
- The use of several excise duty rates for a material

- Revaluation of inventories after changes to excise duty rates
- Licenses for excise duty (ED) reductions and exemptions
- Region-based calculation of excise duty
- Data pool for creating reports.

Key Features

The following table explains the key features available:

Key Feature	Use
Calculation of Excise Duty in Purchasing	When purchasing contracts or purchase orders are created, the system proposes excise duty data from master records or from Customizing based on the default hierarchy . This data is used to calculate excise duty. Excise duty postings and inventory postings do not take place until goods receipt, however. Whether or not the material is ED-paid is important for excise duty postings, and whether the receiving plant or storage location is an ED-paid area or an ED-free location
Calculation of Excise Duty in Inventory Management and Physical Inventory	For dutiable material that is moved (goods movement), the system calculates the excise duties based on the quantity of material moved. Depending on the Customizing settings, the system determines and posts excise duties for the following goods movements and special forms of procurement: • Goods receipts • Goods Issues • Transfer postings • Physical inventory • Goods movements for customer special stocks • Subcontracting • Third-party business • Consignment
Calculation of Excise Duty in Sales	When sales contracts or orders are created, the system proposes excise duty data from master records or from Customizing based on the default hierarchy . This data is used to calculate excise duty. However, excise duty postings and inventory postings are made at the time of the goods issue. Whether or not the material is ED-paid is important for excise duty postings, and whether the receiving plant or storage location is an ED-paid area or an ED-free location

Key Feature	Use
Calculation of Excise Duty in Production Orders	When a dutiable material is produced with components that are also dutiable, excise duty calculation is required in the goods issue and goods receipt. If only the components are dutiable but not the finished product, excise duty postings are only made for the goods issue. Excise duty postings that refer to production orders can only be at the full ED rate, or are ED-free. Excise duty postings at reduced rates are not possible.
Revaluation of Excise Duty Inventories	If the excise duty rate changes, the excise duty value of the inventory also changes. This means that your company has new tax liabilities if there are tax increases, and can make tax claims to the tax office if there are tax reductions. You do not necessarily have to reevaluate excise duty immediately after a tax rate changes. After you have entered the new ED rate in the ED rate table, the system forwards the excise duty inventory with the old ED rate. However, the system posts the ED liabilities or claims with the new ED rate. It posts the difference between the old and new ED rates to a separate account. At the time when you want to perform an ED revaluation, the system alters the value of the excise duty inventory in accordance with the new ED rate. The system writes off the difference between the old and new ED rates. A special ledger structure (FI-GLX) is provided for reporting purposes, and contains database structures for individual items and for summary data. You can use these structures to evaluate ED postings based on various key fields, for example: • Company code • Plant • G/L account • ED status (valuation type) • ED status (FROM location of the material movement) • ED status (TO location of the material movement) • Handling type When excise duties are calculated and posted, the system fills the relevant special ledger structures. The system enters all transactions with dutiable materials in the special ledger, including those that do not involve ED postings, such as movements between two ED-free plants or storage locations. Once you have installed the structures, you can design your own reports using the Report Writer and Report Painter.

Key Feature	Use
Calculation of Cross-Company/Cross-Company Excise Duty	The following functions are available within cross-company or cross-border sales of excise dutiable material: You can map and monitor the following goods movements: • Export (goods issue in issuing plant/issuing storage location) • Import (goods receipt in cross excise duty plant/cross excise duty storage location) • Sales to customer (goods issue in cross excise duty plant/cross excise duty storage location) You can calculate and post excise duties for the following cross-company/cross-border sales scenarios (with and without using bulk shipment in the transportation and distribution (TD) component): • Pickup by the customer • Change of title at discharge • Change of title at loading

4.3.1.2.3 Transportation and Distribution

Business Background

The Transportation and Distribution (TD) covers the logistics activities related to:

- Delivery of product from a delivering plant to a customer
- Transfer of product between two company-owned locations
- Receipt of purchased product from a vendor.

These activities are carried out across the processes of scheduling, load confirmation, and delivery confirmation. The following organizational units are used to support oil industry processes.

These are also data retention levels in the system.

- Transportation Planning Point
- Intransit Storage Location
- Intransit Plant

Integration

The Hydrocarbon Product Management (HPM) application area supports the calculation of standard volumes using temperatures and densities. TD and HPM are integrated so that TD supports multiple units of measure within the same transaction. Temperature and density are important factors in the loading, and delivery process.

Key Features

The following table explains the key features available:

Key Feature	Use
Bulk Shipment Type	The bulk shipment type: • Determines how the shipment is processed • Is a mandatory entry on the initial scheduling screen • Cannot be changed once the shipment has been saved In Customizing each bulk shipment type has a text describing the characteristics of that particular entry. These descriptions should be made as explicit as possible to help when selecting a shipment type during scheduling.
Create/Change Attributes for Batch Material and physical inventory	Using this function you can create new batches and change the attributes of batches during the loading confirmation and delivery confirmation processes. If material is mixed from different batches, a new batch is generated, often with new classification attributes. With this function you can change the attributes of the new batch at loading and delivery confirmation. Loading Confirmation During loading confirmation, the system creates a new batch to represent the product on the vehicle. When creating the new batch, the system takes the attributes for the material on board (in-transit) from the master data record of the batch material. Delivery Confirmation During Delivery Confirmation, the system updates the shipment with the actual quantity delivered to the customer. You can change the in-transit storage location and batch in much the same way as during loading confirmation. However, this function only applies to underlying documents that are discharge relevant
Shipment Worklists and Mass Processing	The shipment worklist is a central access point for working with bulk shipments. The worklist can be used to process single shipments or multiple shipments that match specific selection criteria. The worklist can be used for the following activities: • You can search for bulk shipments using specific selection criteria • You can use the resulting list of shipments as a worklist for processing, changing, or deleting shipments • You can process single shipments so that they reach a specific target status • You can process shipments in batch mode so that they reach a specific target status • You can check the results of the processing in an application log

Key Feature	Use
Scheduling	The scheduling process helps you to plan your shipments and involves the following activities: Group underlying documents including deliveries, shipping notifications and reservations into shipments. Assign shipments to an appropriate vehicle, transport unit, and compartment. Assign a driver to the vehicle (optional). Change the quantities of product to be shipped. Plan transport-related activities using the event handling function
Loading Confirmation	The process of load confirmation records the actual quantities and products loaded for a particular shipment. Manual load confirmation is an alternative to data entry using a Terminal Automation System. Several different processes occur within the load confirmation step, the most important being the entry of actual loaded quantities. Quantities in scheduling are planned quantities and are proposed at the load confirmation stage. The planned quantities and the quantity of the products actually loaded may have changed. You can enter these quantities in the quantity field, or you can enter readings from Vehicle Meters or Rack Meters. In cases where product had been previously left on the vehicle, you can record these quantities in the shipment as prior-to-load quantities. The concept of intransit stock is central to the loading process. A goods movement occurs when the product is moved into the intransit storage location, at which point Quantity Conversion Interface (QCI) parameters can be calculated and stored. In addition, any excise duty postings which are a consequence of the goods movement are also performed.
Delivery Confirmation	The delivery confirmation process is used to confirm the delivery of actual quantities in a bulk shipment. The following diagram shows the underlying processes involved with delivery confirmation. Delivery confirmation is the final step in processing bulk shipments. It enables you to enter the final quantities delivered and to process the differences between quantities delivered and loaded. Several options exist for processing product that has been loaded but not delivered. Delivery confirmation must be completed for each vehicle in the shipment. The vehicles in the shipment each have an individual status, however, it is not until the shipment has a Shipment Status of 6 that shipment processing is complete and the final postings are made. Delivery confirmation is also a prerequisite for Shipment Costing.

Key Feature	Use

Transportation Planning Interface	**Terminal Automation System Interface**
	
	This interface allows data on loading transactions (loading information) to be sent from SAP Oil & Gas to an external system (Terminal Automation System). After the loading transaction has taken place, the external system sends the loading information back to SAP Oil & Gas, where it is processed automatically. The interface supports the transfer of loading information for the following business processes: pick-ups, shipments, goods movements, and physical inventory counts. The Terminal Automation System Interface supports the following functions:
	
	• Sending loading information to an external system
	• Receiving loading information from an external system that is destined for SAP Oil & Gas:
	  ○ Using IDocs and ALE
	  ○ Using an internal table and a Remote Function Call (RFC)
	  ○ Manually entering loading information in SAP Oil & Gas
	  ○ Processing loading information in SAP Oil & Gas Depending on whether the loading information is entered in a sales contract, order or contract call-off, or a shipment, the system calls various function modules for further automatic processing.

Key Feature	Use
Unified Shipment Interface	Depending on whether the loading information is entered in a sales contract, order or contract call-off, or a shipment, the system calls various function modules for further automatic processing. Interface for Delivery Confirmation Processing This interface helps to automatically create delivery confirmations in SAP Oil & Gas. The delivery confirmation is the final step in the shipment process. It contains all data relevant for delivering bulk product. The interface helps to copy this data from external systems to SAP Oil & Gas. The following interfaces in the Transportation and Distribution (TD) component are available for exchanging shipment data with external systems. The shipments whose data is to be transferred, have various shipment statuses: • Transportation Planning Interface (TPI interface) for shipments with status 1 (partly scheduled) and status 2 (completely scheduled). The data is transferred using IDoc OILSHI01 to SAP Oil & Gas, where function module IDOC_INPUT_OILSH1 or IDOC_INPUT_OILSH2 (if the shipment comparer is used) is called. • Terminal Automation System interface (TAS interface) for shipments with status 3 (partly loaded) and status 4 (completely loaded). The data is transferred using IDoc OILLDD01 to SAP Oil & Gas, where function module IDOC_INPUT_OILLDD is called. • Interface for delivery confirmation processing (DCP interface) for shipments with status 5 (partly confirmed) and status 6 (completely confirmed). The data is transferred using an RFC to SAP Oil & Gas, where function module RFC_SHIPMENT_DEL_CONF_PROCESS is called.

4.3.1.2.4 Marketing, Accounting and Pricing

Business Background

The solution Marketing, Accounting, and Pricing (MAP) is enhanced with additional functions required for the downstream oil business.

Key Features

The following table explains the key features available:

Key Feature	Use
Contract pricing	Contract pricing determines the price of a material based on the contract. The contract number is used as a reference in sales documents to allow contract-specific pricing.
Cumulative contract call-off pricing	In cumulative call-off pricing, the price of a material is determined dependent on the (current) order quantity invoiced. Cumulative call-off pricing makes it possible to give a customer a discount based on the quantity already invoiced.
Customer price lists	The customer price list simulates the pricing which would be performed in an order. You can use the customer price list to view prices for a pre-defined list of frequently ordered products and quantities.
Default pricing dates	Carry forwarded from sales order
Head office and branch level pricing	Pricing procedure of a head office for customers that are assigned to the head office can be used . relationship between head office and branch offices in the customer master data record can be set up.
Location flexible pricing using the differential reference code (DRC)	The Differential Reference Code (DRC) is a means of grouping ship-to customers according to their geographic location. It enables you to construct a pricing strategy based on market conditions in specific areas.
Time pricing	In the oil industry, product prices often change several times a day. For example, during the busiest hour at the loading site, the prices could be higher. Date and Time Pricing allows flexible pricing, which takes the time of day into account.
Gross and net volume pricing	Gross and Net Unit Of Measure pricing is to control if the system should determine the price of a material based on gross or net unit of measure.
Formula and average pricing	Formula and Average (F&A) Pricing uses external quotations such as Platts, Reuters, and others to determine the price of a material. It can be used both on the purchasing side (MM) as well as on the sales side (SD). The purpose of formula and average pricing is to enable the calculation of product prices based on external quotations over a set time period. The calculation is performed with company-defined calculation rules. Currency fluctuations within the time period are taken into account either by daily conversion or by averaging.
Differential invoicing	If the product is delivered before the averaging period has elapsed, it is necessary to create a provisional invoice. When the averaging period has ended and the final price is known, the price difference is invoiced by creating a differential invoice.

Key Feature	Use
Origin, destination, and external data in the sales and purchasing cycle	Using External Details in sales documents and purchasing documents, we can store additional information on the origin and the destination of the ship-to party as well as other information which is relevant for shipping. This information is used for calculating US excise duty, among other things. You can also set additional delivery data and define the following additional fields
Conditional exclusion (highest prices)	Condition exclusion technique with the IS-Oil enhancement which allows selection of the highest price.
Alternative pricing date at invoicing	Pricing date & pricing time ,loading date & loading time can be updated at the creation of invoice
Five-decimal pricing	Five Decimal Pricing allows us to create condition record for prices ,surcharges, discounts with five decimal places. ->Subtotals of a document currency with five decimal places result in more accurate calculations and are intended for the following purposes.
Additional Information on Invoice Output	The print program `RVADIN01` for invoices has been enhanced to include gross/net Hydrocarbon Product Management (HPM) data on the invoice form `MAP_Invoice` . Using this print program, you can include additional information on the invoice, such as the temperature and density of the material.
Integration with SAP Commodity Procurement	The extended features for commodity procurement allows you to • Create commodity purchase orders • Define flexible pricing rules based on market prices and qualities using Derivatives Contracts Specifications (DCS) and Commodity Pricing Engine (CPE) • Verify new Material Management provisional and final invoice
Integration with SAP Commodity Sales	The extended features for commodity sales allows you to • Create commodity sales contracts and sales orders • Define flexible pricing rules based on market prices and qualities using Derivatives Contracts Specifications (DCS) and Commodity Pricing Engine (CPE) • Authority to Load (ATL) credit check for TSW nominations • Verify new Sales Distribution provisional and final invoice

4.3.1.2.5 Marketing, Contracts and Order Entry

Business Background

The solution Marketing, Contracts, and Order Entry meets the requirements of the oil industry in the areas of fast order entry and contract processing. Customer order processing and contract processing have been enhanced with the following functions:

- Calculation of excise duty in purchasing and sales
- Automatic determination of organizational data
- Display and defaulting of items from the last order
- Determination of a sequence of up to five preferred delivery plants for the delivery of the goods
- Release of non-delivered quantities of a contract call-off
- Restrictions for deviations from the contract conditions
- Redetermination of the item type during order entry

Key Features

The following table explains the key features available:

Key Feature	Use
Purchase Order Number as a Required Entry	If a customer order number appears on the order for that customer, you can define the PO number (purchase order number) field as a required entry.
Contact Person Details	You can save specific information about contact persons at the customer location in the Contact person view of the customer master record. Contact person details can contain the following information: • Last name and first name of the contact person • Telephone number of the contact person • Form of address • Department • Function

Key Feature	Use
Last Order Number	When you create an order, the system looks up then number of the last order that was created for the same ship-to party, sold-to party, and sales area combination. If an order exists, the number is displayed in the Last order field in the Create order: Overview screen. In such a case you have the following options: • You can display the last order • You can copy items from the last order into the order you are processing. You can copy the following data: • The material in the last order • The material and quantities in the last order • Individual items from a selection list • You can search the order history for orders with other ship-to party, sold-to party, and sales area combinations by entering R as the matchcode ID in the matchcode search.
Item Category Redetermination	During sales order processing, the system can automatically change the item category to the one configured for the customer/material combination. The system uses the item category determined by the standard procedure together with the customer classification and material group to determine a new item category. This can be used, for example, in consignment processing. Using item category redetermination, consignment materials can be entered in the same sales order with materials which are sold normally. You can also configure the item category redetermination for any other item categories.
Automatic Plant Determination	If you do not set the IS-Oil planExcise Dutyt determination indicator PD , standard plant determination is invoked. In this case, the system searches for the delivering plant in the following sequence: • Customer-material information record • Customer master • Material master
Excise Duty	If the material is subject to excise duty, the system displays information about the excise duty status in the HT(excise duty handling type) and To (excise duty tax key for "to" destination) fields. The definition of the fields is contained in the Tariffs Duties and Permits (TDP) component. You must define theED group (excise duty group) field in the Oil specific data view in the material master record.
Partner Function Plausibility Check	The system checks whether a ship-to party has already been assigned to another sold-to party in a specific sales area.

Key Feature	Use
Contract Handling	Contract handling covers the following activities: • Set up call-off restrictions to force compliance with contract terms • Quantity correction of call-offs using the final delivery indicator • Assign multiple ship-to partners to a contract
Multiple Ship-To Parties Per Contract	With this function you can link multiple ship-to parties to a single contract. You can also delete or add ship-to parties to contracts that already exist.
Restrictions for Contract Call-Offs	The following restrictions can be entered in the contract. Call-offs which deviate from the contract restrictions trigger a message. The message type indicator setting in the contract determines which type of message displayed. • Product restriction: A contract call-off can only contain items which were created with reference to a contract. Thus, no materials can be called-off without a reference to a contract. • Quantity restriction: Over-delivery is impossible. • Unit of measure restriction: No change to the unit of measure is allowed. • Ship-to party restriction: A call-off is only allowed for ship-to parties which are defined in the contract (see also: Multiple Ship-to Parties per Contract). • Terms of payment restrictions: No change to the terms of payment is allowed. • Validity restrictions: Checks the beginning and the end of the validity period.
Final Delivery Indicator	The final delivery indicator is used to release non-delivered quantities at contract level for a contract call-off that is the quantity is available again on the contract for a contract call-off. If there are partial deliveries for a contract call-off, when you set the final delivery indicator in the delivery document, the non-delivered material of the quantity in the contract can be re-added to the contract quantity. In addition, the system assigns the status fully delivered to the contract call-off.

4.3.1.2.6 Marketing Retail Network

Business Background

A company may carry out its business operations at a large number of different locations. Each of these business locations has its own story to tell in terms of performance and profitability. For oil companies, the business location is typically the service station, but may include depots and non-fuel sales outlets.

This component provides functions for managing business locations such as service stations, depots and terminals. With these functions you can manage sales data, data on vendors, dealers, supply contracts, plant maintenance, and so on.

The system allows you to enter and integrate all relevant data on business locations, independent of the geographic location, in a virtual database. In this way, Marketing Retail Network (MRN) supports a multitude of functions, from delivery planning to profitability analysis.

Key Features

The following table explains the key features available:

Key Feature	Use
User-Defined General Data for a Business Location	A link is provided from the business location to the long text handling utility. The link supports the centralized storage of text-based information for each business location. The MRN Location Management application is sometimes described as a virtual application. This is because the application has no transaction data of its own, rather it uses transaction postings in related components, such as Sales and Distribution (SD) and Controlling (CO) to derive information about the business location in terms of revenue and profitability. The MRN Location Management application provides enhanced handling of SD Sales Contracts for Retail Network users. Marking Business Locations for Deletion You can only archive a business location record if it is marked for deletion.
MRN Data Archiving	Archiving Procedure This process describes the basic procedures when performing an archiving session. You are in the Archive Administration; Initial Screen (transaction SARA). You have entered the name of the archiving object in the Object Name field. Archive administration has access to the archive files you want to reload.

4.3.1.2.7 Bulk Distribution Requirements Planning

Business Background

The solution optimizes planning in petroleum product distribution. It supports the active management of customer inventory by a vendor inventory (VMI: vendor-managed inventory). The vendor can use it to pre-plan replenishment deliveries to a customer.

Key Features

The following table explains the key features available:

Key Feature	Use
Site Control Parameters (SCP)	Site control parameters record site information that is used to control or influence bulk logistical processes such as delivery planning, shipment scheduling and unloading operations.
Replenishment Control Parameters	You can enter material-specific parameters to control bulk replenishment at a delivery site by using the replenishment control parameters screen for that site.
Storage Object Characteristics (SOC)	In connection with bulk material handling processes such as delivery planning, scheduling and unloading operations there is a requirement to record information about the tanks, containers or silos that are used to receive the bulk material.
Sales Meter Management	In connection with bulk material handling processes such as delivery planning, scheduling and unloading operations, there is a requirement to produce flow meter data and convert it to product quantities.

4.3.1.3 Bulk Supply Chain Operations

Business Background

Bulk supply chain operations allows you to integrate process management for hydrocarbon products, from post-planning to scheduling to post-custody transfer. It supports you in day-to-day operational scheduling, nomination, tracking, inventory projections, custody transfers, and service management for bulk hydrocarbon supply chain movements. It provides you a single, comprehensive platform for managing inventory, scheduling, and transportation processes; integrates external systems for trading, production, and service provider analytics; and automates routine tasks in the background. As a result, hydrocarbon providers can reduce inventory working capital, lower transportation and storage costs, improve fleet utilization, make more informed decisions, and eliminate overhead time and costs.

4.3.1.3.1 Exchanges

Business Background

The solution enables the setup of exchange agreements between oil and gas companies and handles the exchange of products at various locations. In order to manage exchange business transactions, you can:

- Create an exchange agreement
- Create quantity schedules for planning and monitoring material quantities
- Balance differences in value of exchanged materials using fees
- Settle claims and liabilities against one another (netting)
- Exchange unlike products, and balance the logical inventory that results (logical inventory adjustment)
- Create exchange statements that reflect the current status of your exchange activities in a specific period
- Create additional evaluations with respect to your exchange activities (for example, creating a list of all goods receipts and goods issues within an exchange agreement) .

Key Features

The following table explains the key features available:

Key Feature	Use
Quantity Schedules	Quantity Schedule let you control and monitor the quantity that can be delivered/received by period in contracts and subsequent call off. .
Fee handling	In an exchange agreement, fees (Handling, Location, Differential, Wharfage) are used to settle the difference in value between the materials that are exchanged. They are assigned to contracts and copied to subsequent documents. Depending on Exchange agreement settings they can be internally or externally posted.
Sub/Base product relationships	You exchange several sub products but to simplify Exchange balance accounting, only a base product is tracked.
Logical Inventory Adjustment	A logical inventory adjustment can be posted to settle quantity imbalances of an exchange agreement without posting physical movements. This can also include an optional negotiated payment.
Purchase Assignment (Load Balancing)	Business scenario where you assign an existing contract or purchase order to a delivery in order to fulfill a customer order.
Netting In movement-based	Netting you collect all the bills (billing documents) into one single Netting document and then settle up with the exchange partner, rather than billing each goods movement to the exchange partner separately.

Key Feature	Use
Exchange Statement	The exchange statement is used to inform your partner of the current status of the exchange agreement.
Exchange Reporting	Several reports can be used to monitor the exchange status (Customer balances, Vendor balances, Exchange balances , Evaluations of existing quantity schedules, Evaluations of material movements, Evaluations of exchange entitlements, Evaluations of exchange transactions and so on)
Exchange Agreement	An exchange agreement is made between two oil companies (exchange partners), when the companies would like to exchange product at different locations. The exchange agreement consists of the exchange header and the assigned sales contracts and purchase contracts.
Split Invoicing	Split invoicing allows you to create several invoices with different terms of payment, instead of one invoice. For example, using the split invoice, you can invoice fees, taxes and the material value (of the product) separately.
Pricing-based Exchange Fees with Commodity Management	Pricing-based exchange fees allows you to setup exchanges fees within standard pricing conditions in sales and purchasing documents. It provides an integration option into Commodity Management (CM) and the optional usage of the Commodity Pricing Engine (CPE) for stock-market related exchange fees.

4.3.1.3.2 Trader's and Scheduler's Workbench

Business Background

The Trader’s and Scheduler’s Workbench (TSW) solution provides functions for stock projection and for planning and scheduling bulk shipments using nominations. TSW provides the relevant master data to model the supply chain.The real time inventory, nomination data, inventory projections and simulations along with rack issues for different terminals in single screen . These insights enable the scheduler to schedule bulk shipments while taking into account supply, demand, and available transportation.

Key Features

The following table explains the key features available:

Key Feature	Use
Inventory Planning Workbench (IPW)	The Inventory Planning Workbench enables schedulers to • Load and supervise a range of terminals and products • Monitor the inventory run down for past and future periods • View the average quantity for rack issues by day, week, and month. Change the date range of the rack issue forecast and enter estimates manually • Set up a framework for real-time inventory alerts allowing sufficient time to plan a reaction • Simulate possible future scenarios to understand the impacts of various decision opportunities • Simulate logistic costs of nominations and simulations for a given rolling period
Nomination Scheduling	With nomination scheduling you can schedule and agree bulk movements with all stakeholders. For routine bulk movements, schedules and bulk movements can be copied. The schedules can be visualized on a map which allows a scheduler or a supply chain manager to monitor the status of all movements and be alerted on any changes. For any bulk demand (simulation, nomination), the Scheduling Assistant identifies all feasible sources of supply and their associated costs.Select a supply source to complete the respective nomination or simulation. View the transshipment points in addition to the source locations.
Ticketing	This feature allows you to record the official notices sent by Fax or E-mail by your business partners (for example, carriers) to inform you about the product movements.
Location balancing	This feature allows you to compare demand and supply quantities for a specific period and location, and to maintain a balance between these quantities.
Three-way pegging	You can use Three-Way Pegging to plan and schedule bulk shipments based on supply and demand information.
Integration with SAP Integrated Business Planning (IBP)	SAP S/4HANA supports the integration with SAP Integrated Business Planning allowing the exchange of planning data to forecast demands and plan crude procurement.

Key Feature	Use
Stock Projection Worksheet (SPW)	During the stock projection process, you can calculate, change, and simulate inventory forecasts using the Stock Projection Worksheet in Trader's and Scheduler's Workbench (TSW). The Stock Projection Worksheet calculates and shows the inventory forecast for a date or time period and for combinations of material, location, transport system, and valuation type. You can use the What-If functions of the Stock Projection Worksheet to simulate different affects on the inventory. You can perform stock projection for the following types of inventories. • Base Inventory The SAP book inventory is generally the basis for calculating the base inventory. The system calculates the base inventory by taking into account all actual and expected incoming and outgoing movements. However, in Customizing you can define the physical inventory as the basis for calculating the base inventory. In this case, the Stock Projection Worksheet uses the latest update of the physical inventory as the starting inventory. • What-If Inventory The basis for calculating the what-if (simulated) inventory is either the physical inventory or SAP book inventory. The calculation of the what-if inventory considers all the actual and expected incoming and outgoing movements including what-if figures entered in the Stock Projection Worksheet. • Physical Inventory You can use the physical inventory as the basis for generating the Stock Projection Worksheet . In this case, the system calculates the base inventory using the physical inventory. Also, the what-if inventory for future days is based on the latest update of the physical inventory. The starting inventory for a particular date is initially calculated using the first inventory quantities received for that date, for example the last reported gauge readings. In the Stock Projection Worksheet , the base inventory column displays physical inventory and the column for the planned inventory displays the what-if quantities.

4.3.1.3.3 Cost Management for Hydrocarbons

Business Background

Demurrage and Detention are categorized under direct unplanned costs. This is a very significant cost aspect for Oil & Gas companies to look at methods to bring transparency, traceability and benchmarking. Demurrage management involves a lot of negotiations and discussions between the involved parties that are unique to each case. Similarly, there are nterfaces with third parties to get time logs and claims. The demurrage management framework allows you to manage the demurrage charge creation, sharing, allocation and invoicing.

Key Features

The following table explains the key features available:

Key Feature	Use
Schedule Hydrocarbon Trips	You can use this feature to organize different variants for easily viewing the list of nominations, TD shipments or outbound deliveries and their assignment to shipment items. In case an item is not assigned to a trip, then it can be selected as a reference for trip creation through the same worklist.
Laytime and Demurrage	You can use this feature to manage the trip life cycle and to calculate the laytime and demurrage costs. The trip allows demurrage status management and end to end demurrage tracking across nominations, or TD shipments or outbound delivery. You can link several reference document items to a trip item and copy the data from them to reduce manual intervention. The laytime calculation is not restricted to a nomination and is calculated at the level of a trip item. This will allow the extension of laytime calculation to TSW, TD, and SD modules as well as various modes of transport. The charges can be set up in the app as a receivable or a payable and are integrated accordingly with SD and MM pricing and document flow.

4.3.1.4 Upstream Operations Management

Business Background

Upstream Operations Management enables companies, for example, oil and gas companies, to carry out their exploration and production operations in the most cost-efficient way to maximize profitability.

Key Features

The following table explains the key features available:

Key Feature	Use
Field Data Capture	• Maintain measurements for various nodes in a production network for a specific time range The measurements can vary from volumetric flow rates to pressure and from compositional analysis to deferment events. These measurements are requisite to run volumetric allocations. • View data errors present in the selected production network and allocation period and subsequently fix the errors • Connect to your field data repository and bring in the required data to perform an allocation
Production Allocation	• Allocate volumes of produced and injected materials (for example, crude oil, condensate, water, and natural gas) to their originating well completions You can determine the sales, fuel, inventory or non-sales (for example, re-injected or fuel gas) dispositions measured on specific points in the network as the product flows downstream from the well completion towards the network's end point, custody transfer point, or furthest downstream node. You can also determine the quantity that can be produced within a production network given the constraints of the network objects that make up that production network. • Manage the business processes for both hydrocarbon production and production revenue accounting
Deferment Management	• Analyze the difference between the system capability and the allocated result It explains the reasons for overproduction and underproduction. • Analyze whether deferment events are linked to available work orders You can view existing events linked to work orders, link events where they are missing, or link multiple events to an existing work order.
Production Forecasting	• Automate the manual and error-prone forecasting process to optimize scarce operational resources and minimize costs • Collect and collate forecast information The information is collected from various parts of the value chain; for example, reservoir engineering, drilling, facilities management, pipeline planners and schedulers, terminal managers, maintenance, production, and so on. All the constraints are captured in UOM. • Use the captured constraints to calculate the production forecast The production forecast is used against the actual produced volumes to understand the deferment volume at each object in the production network.

4.3.2 Utilities

4.3.2.1 Finance

4.3.2.1.1 Bill to Cash

4.3.2.1.1.1 Billing of Energy and Services

Billing of Energy Products

Billing of energy products is performed for all types of customer groups including commercial, industrial, and residential customers. It takes place periodically for a defined period (such as monthly, yearly) or is triggered by certain events such as a move-out. Defining products is used as the basis for billing.

The amount to be paid is calculated by applying rates or products to the measurement data. The measurement data can either be discrete meter reading values or equidistant time series values. It is also possible to bill on the basis of flat rates. The end customer's bill can include not only utilities billing documents but also documents from other sources.

By creating a budget billing plan, the utilities payments are evenly spread across the supply period.

The following key features support the process:

Key Feature	Use
Definition of rates and products	Billing is performed on the basis of rates/products. This includes billing rules and various other aspects, such as prices and discounts. In deregulated markets, rates/products can be managed for energy supply or grid usage according to the market role of the utilities company.
Schedule billing and budget billing plan	To control when billing or budget billing is executed, certain parameters and dates such as the end of the billing period, budget billing dates, period length and so on are defined in a schedule.
Billing and simulation	To calculate the amount to be paid, measurement data is processed and priced according to the assigned billing rules. The billing simulation can be executed to obtain billing results without making accounting-relevant changes. To avoid overcharged bills, bills can be outsorted according to special validations that can be customized. They are then automatically locked for further processes until they are released. Billing reversal can initiated to deal with incorrect bills.

Key Feature	Use
Budget billing plan	A utility company bills for its services at the end of a supply period. Throughout the current period, it therefore charges budget billing amounts to spread the payments evenly. The dates and the amounts for the budget billing amounts are defined in the budget billing plan. The budget billing plan forms the basis for the increase in the budget billing amount.
Utility product integration	The Utilities Product Integration Layer offers an interface to SAP S/4HANA to automate the creation of commodity products that are defined in an external system. For example, you can import utilities billing artifacts from external systems, and you can modify them. You can simulate billing of commodity products that are defined in external systems. The Utilities Product Integration Layer also includes the following: • Support for updating installation facts for the processes supported by SAP S/4HANA Utilities for customer engagement • Storage of standard attributes such as contract term

4.3.2.1.2 Commerce Management

4.3.2.1.2.1 Receivables Management and Payment Handling

In deregulated markets, the distributor is usually paid for providing grid-related services, such as grid usage, to other market participants. A very common market model of handling grid usage invoices and payments between the supplier and distributor is described as follows:

- The distributor sends grid usage invoices to the supplier.
- The supplier checks the invoices and makes payments to the distributor.
- The consumer, as the consumer of energy, pays for grid usage as part of their energy product provided by the supplier.

Invoice Verification and Payment (Supplier View)

Key Feature	Use
Receive and process grid usage bills	Grid usage bills can be received using market communication, checked and verified and posted to accounting. The data that is exchanged relates to end customers (points of delivery) to whom the supplier provides services or an energy product.

Key Feature	Use
Create complaints	Complaints can be created for bills for which the supplier has a grievance.
Send payment or non-payment advice notes	Payment and non-payment advice notes can be sent to the market partner according to the verification results.
Monitor communication	Data exchange to involved market partners is logged and can be monitored.

Invoice Receivables Mgmt and Paymt Handling (Distributor View)

Key Feature	Use
Prepare and send grid usage bills to suppliers	Electronic bills can be created at end customer level. Grid usage bills are aggregated for each supplier and sent to the suppliers electronically.
Receive and process incoming payments and payment advice notes	Complaint notifications and payment advice notes are received electronically and can be processed. Incoming payments that have been posted to the supplier's account can be assigned to the corresponding payment advice notes. Receivables can be cleared at end customer level. Complaint notifications can be processed to validate the complaint. Dunning activities can be triggered if required.
Postprocessing Grid Usage Payments	Payments can be postprocessed at account level. Payments of a supplier that cannot be allocated at end customer level can be reimbursed.
Monitor communication	Data exchange to involved market partners is logged and can be monitored.

4.3.2.2 Metering

4.3.2.2.1 Meter Logistics and Operations Service

4.3.2.2.1.1 Measurement Data Management

Measurement Data Processing

Measurement data comprises all types of measurement data collected by meters. It can be equidistant time series values or discrete values. It can have the character of meter readings (cumulative index values), consumption, demand data, and so on. Data provided by meters can either be read remotely by smart meters or manually for conventional meters.

Measurement data is validated when it is received. If validation is successful, it is available for subsequent processes such as energy billing or energy settlement.

In deregulated markets, measurement data is communicated between various market participants.

Key Feature	Use
Manage measurement data	The master data can be configured so that measurement data in the form of discrete data or equidistant time series values can be managed.
Schedule the collection of discrete meter readings	In the case of periodic collection of discrete meter readings, periodic meter reading orders are created and issued according to this schedule.
Receive and process measurement data	This feature is used to upload or enter measurement data. This data is provided from different sources, such as external systems, market partners or read manually. The measurement data is validated and if necessary replacement procedures are applied. Manual adjustments are possible. Additional calculations can be executed to convert meter readings to consumption values, sums of quantities and so on.
Provide measurement data to market partners	Measurement data can be sent to other market participants. You can define what types of information is received by certain recipients. Monitoring and error handling capabilities are available for the communication process.

Energy Schedule and Settlement in Deregulated Utilities Markets

In deregulated markets, a common requirement consists of determining energy consumption at specific aggregated levels or entities and communicating this information to involved market partners.

Energy Schedule: The supplier is responsible for determining an energy schedule for their customers for the following day. The energy schedule (usually based on consumption forecasts) can be the total calculated load shape for the customers in a specific grid, i.e. a time series of aggregated consumption values for the next (schedule) day. This energy schedule has to be sent to the involved market participants, such as the responsible distributor and settlement coordinator.

Energy Settlement: The distributor determines the total load shape for each supplier based on the measured energy consumption of the suppliers' customers and communicates it to suppliers and involved market participants.

Key Feature	Use
Settlement-related entities	The following entities that can be used to group points of delivery are provided: Settlement Unit and Utilities Grid. The assignment of a point of delivery to these entities is tracked on a time-related basis.
Aggregation of time series values	Aggregation of consumption of all points of delivery with assignment to a settlement unit or grid can be calculated and processed in the form of equidistant profile values. The same logic can be applied to aggregate energy feedings into the grid.
Synthetic load profiling	Synthetic load profiling is based on synthetic profiles for a specific customer group and customer-specific usage factors. Synthetic load profiling provides the capability to de-aggregate a load shape. The resulting equidistant time series values can be processed to calculate aggregated consumption.
Provision of settlement results to market participants	Involved market participants are automatically determined. Settlement results can be sent to them. Data exchange to involved market partners is logged an can be monitored.
Monitor communication	Data exchange to involved market partners is logged and can be monitored.

4.3.2.2.1.2 Meter Logistics and Operation Services

Meter and Device Management

Device Management covers procurement, warehousing and stock movement of devices by using the integration in logistic process as well as installation, replacement and removal of meters and other devices at the customer location. These meters can be smart or conventional meters. The remote functional capabilities of smart meters have to be managed so that they can be leveraged in all relevant processes.

To ensure a correct measurement of values, inspection and certification is applied to all relevant devices.

Key Feature	Use
Manage device data	Devices are configured by assigning device-specific master data. This includes registers, the device category and other data such as commands.

Key Feature	Use
Installation of devices	Devices can be installed, replaced and removed. If device attributes are changed, the device can be modified. It is possible to maintain allocations and relationships between devices.
Inspection of devices	The devices can be inspected in different ways according to legal and internal requirements. Periodic replacement can be used to manage all devices that have to be replaced in a certain year. Individual devices are inspected in the sample lot procedure. These devices are representative of a group of devices. You can certify individual devices during certification.

Disconnection and Reconnection Management

Disconnection and reconnection processes are managed by the utilities company. Disconnection is the interruption of a utilities service. Possible reasons for such an interruption can be outstanding payments or at the request of the utilities company or a customer.

Smart meters can be disconnected / reconnected either remotely or manually according to the device capabilities. Additional conditions or constraints are also considered with conventional meters, which are disconnected / reconnected manually.

Key Feature	Use
Processing disconnection	This feature covers the processing of disconnections requested by customers as well as automatically triggered disconnections. In the latter case, an automatic request for disconnection is launched according to the customer's status, for example, as defined in the dunning process.
Processing reconnection	This feature covers the processing of reconnections requested by customers as well as automatically triggered reconnections. In the latter case, an automatic request for reconnection is launched according to the customer's status, for example, in the incoming payment process. This implies that reconnection is triggered based on an incoming payment or a customer request.

4.3.2.3 Sales

4.3.2.3.1 Sales and Customer Service for Residential Customers/Commercial and Industrial Customers

4.3.2.3.1.1 Customer Service Management

PoD Master Data and Registration Management (Distributor View)

In deregulated markets, the distributor usually manages the master data and service registrations for all points of delivery (PoD) in their grid area. They maintain master data and communicate changes in master data to all other involved market participants. They manage registration processes, such as start and end of supply, change of supplier, and so on.

Key Feature	Use
Management of PoD-related master data	PoD master data can be created or changed. Changes can either be applied manually or initiated by requests received electronically or notification messages. Creation and changes to the PoD address, settlement-related information (usage factor, synthetic profiles) are communicated to the market participants involved electronically.
Managing Grid Usage Registrations and Terminations	Requests for registration and termination of supply services at PoD level can be received and processed automatically to minimize manual interactions. Acknowledgement and notification messages can be sent electronically to the involved market participants. PoD master data can be changed accordingly.
Monitor communication and registration processes	The progress of registration processes and data exchange to involved market partners is logged and can be monitored.

Registration for Grid Usage (Supplier View)

In deregulated markets, the supplier has a supply contract with the end customer. When the supplier concludes a new contract with an end customer at a PoD, the supplier has to be registered to deliver energy to this PoD. A request for start of supply registration is sent to the distributor. Upon ending a supply contract, the registration for grid usage has to be terminated. A request for end of supply is sent to the distributor.

Key Feature	Use
Registering for grid usage	A request to register grid usage for a PoD can be created and sent to the market participants electronically using market communication.
Terminating grid usage	A request to terminate grid usage for a PoD can be created and sent to the market participants electronically using market communication.
Monitor communication for registration and termination processes	Progress of registration and termination processes and data exchange to involved market partners is logged and can be monitored.

4.3.2.3.1.2 Multichannel Foundation for Utilities and Public Sector

For Utilities

Multichannel Foundation for Utilities and Public Sector is a customer-facing solution based on Gateway. It provides utility companies a powerful and cost-effective way to extend their customer interactions to digital channels such as Web, Mobile, and Social. SAP Multichannel Foundation for Utilities offers a set of standardized and reusable OData services that are used by the customer-facing applications to access data and processes from SAP for Utilities.

The standard services consist of self-service scenarios that enable customers to securely access and manage key account information and perform important activities online, like bill payment, entering meter readings, creating inquiries and sending requests to a utility company.

A responsive Web application template for customer self-services is also included with the solution.

Key Feature	Use
Managing Online Accounts	This feature enables the customer to manage their online accounts in the following ways: • Create a new online account (as an existing customer of the utility company) • As a new customer, create a new business partner with a new associated online account • Log in to an online account • Log out of an online account • Change password of the online account • Reset password • Switch between multiple business partners linked to an online account

Key Feature	Use
Managing Customer Details	This feature enables the customer to manage their personal and contact information in the following ways: • View and update personal information • View and update address information • View and update contact information such as phone and e-mail • View and update preferred method of communication • View and update preferred communication language • View and update billing address for the business agreement(s)
Managing Utility Contracts	This feature enables the customer to manage their utility contracts in the following ways: • Create a utility contract (move in) • End a contract (move out) • View and update details of a contract • Start a utilities sales contract in SAP S/4HANA Utilities for customer engagement • End a utilities sales contract in SAP S/4HANA Utilities for customer engagement • Perform the product change process for a utilities sales contract in SAP S/4HANA Utilities for customer engagement • Use configurable product attributes when creating a utilities sales contract or processing a product change in SAP S/4HANA Utilities for customer engagement
Managing Meter Reading Data	This feature enables the customer to manage meter reading data in the following ways: • View meter reading history • View upcoming meter reading dates • Enter a meter reading • Submit a meter reading without having the need to log on with a username and password

Key Feature	Use

Viewing Bills and Consumption	This feature enables the customer to view their billing and consumption information in the following ways::
	• View account summary
	• View consumption history
	• View bills
	• View details of a specific bill
	• Download the bill as a PDF file
	• Inquire about a specific bill
	• Additional features for smart meter users (based on SAP EDM) include:
	  ○ View current consumption
	  ○ View forecasted consumption
	  ○ Download consumption data

Managing Budget Billing Plans	This feature allows a customer to manage their budget billing plans for their contracts in the following ways: • View budget billing plans • Modify current budget billing plan amount to the value within the allowed range and specify the starting date for the changed plan • Opt in to a payment plan and specify the starting month for the payment plan • Opt-out of a payment plan
Managing Payments	This product feature enables a customer to manage payments through their online accounts in the following ways: • Manage bank account details • Manage credit card details • View and update payment and refund account assignment • Make a one-time payment • Make a one-time payment without having the need to log on with a username and password • View payment history • Cancel a scheduled payment before it is processed

Key Feature	Use
Communicating with the Utility Company	This feature enables the customer to manage their communication with the utility company in the following ways: • Send a message to the utility company • Attach a file when sending a message • Trigger a customer follow-up workflow, automatically • View past interactions with the utility company • Request a change of data through an approval process • View alerts • Create service requests using service notification • View the service notification history • View a service order linked to a service notification • View and download the electronic version of the letters sent by the utility company such as welcome letters and dunning letters • Create and search interaction records
Managing Outages	This feature allows a customer to manage their energy outages in the following ways: • Report an outage for their property • View outage map published by the utility company
Agent Co-browsing	This product feature enables a customer service agent to co-browse the self-service Website with a customer should they face difficulty in navigating through the Website, or finding a page, menu or button to carry out a task. The agent sees the same information on the Website as the customer and is able to guide them. This feature allows the agent to do the following: • Search for a customer using first name, last name, contract account ID, business partner ID, address, phone and E-mail • Co-browse the entire self-service Website with the customer • Perform some actions such as entering a meter reading and updating the address on behalf of the customer

4.3.2.3.1.3 Integration with a Marketing System

Business Background

You can integrate SAP S/4HANA with a marketing system (for example, SAP Marketing Cloud) to use utilities-specific data for marketing activities.

Key Features

The following table explains the key feature available:

Key Feature	Use
Replicating utilities-specific data	Utilities-specific data such as contract accounts, contracts, sales contracts, premises, installations, installation facts, billing data, consumption data, and utilities customer scores can be replicated to a marketing system.

4.3.2.4 Country/Region-Specific Features in Utilities

Key Features

The following table explains the key features available for the countries/regions:

Country/Region	Key Feature	Use
Bulgaria	Subsidy	Maintain, process, report subsides.
Brazil	Microgeneration	Manage micro and mini energy compensation process. Support utility customers to generate electricity at one account, use this energy to compensate the bill against other account(s) and transfer any available excess energy credits to another account owned by the customer.
Canada	Sampling Procedure	Manage device sampling process. Determine random numbers of sample devices through Pseudo-Chaotic Algorithm. Determine whether a sampling lot meets the requirements for a sampling inspection before the samples are drawn by use of sampling process such as Single, Double, Multiple, Sequential sampling procedure.
Czech Republic	Seals Management	Record the lifecycle of seals, from purchasing through issue to a responsible person and installation on a device to depreciation. You can display or change information, and create a statistical report about the seals.

Country/Region	Key Feature	Use
	Benefits & Subsidies for Special Customers	Perform billing, invoicing and reporting of benefits. Maintain Czech Republic-specific data for personal benefit and use this data to apply discounts towards the bills of eligible persons, for example, veterans of different wars, invalids, families with numerous children.
	Budget Billing	Perform Budget Billing for small and large customers. For small customers, calculate budget billing amounts using weighing key. For large customers, generate one or multiple budget billing requests in a billing period of one month.
Hungary	Billing	Process penalty. Support processing of billing penalty in case of the violation of contract by a utility consumer. Create bill for a specific gas volume that has been determined and recorded due to illegal gas withdrawal based on Act on Gas Energy (GET).
	Partial billing	Perform Budget Billing based on agreed quantity and perform billing reversal. Support multiple number of billing and correction periods through Dynamic period control (DPC). You can generate billing documents based on estimate meter readings. Entering an actual meter reading result, at any time, triggers dynamic back billing back to the last actual meter reading result. The system corrects any billing periods that are based on estimated meter reading results. Support monthly budget billing based on quantity agreed for each register. DPC for Hungary uses agreed quantity instead of standard estimation procedure for partial billing.
	Advance Payment	Calculate fulfilment date. You can calculate fulfilment date for periodic settlement of goods and services based on: • Billing date • Last day of settlement period • Payment due date
	Billing	Calculate fulfilment date. You can calculate fulfilment date for periodic settlement of goods and services based on: • Billing date • Last day of settlement period • Payment due date

Country/Region	Key Feature	Use
India	Late Payment Charge (LPC)	Calculate Late Payment Charges (LPC). You can calculate and charge Late Payment Charges for delayed payment on any billing component, or on the total billed amount raised in an invoice.
	Prompt Payment Incentives (PPI)	Provide the customer an incentive for paying utility charges well within the payment due date.
	Prompt Payment Incentives (PPI)	Provide the customer an incentive for paying utility charges well within the payment due date.
	Security Deposit	Manage cash and non-cash security deposits, such as savings accounts and payment guarantees. Revise the initial Security deposit taken at the time of activation of utility service on a mass scale and determine the interest payable by your company on Security Deposit collected from customers.
	Device Management - Seals Management	Mange and track a Seal as it moves through the different statuses in its life cycle.
	Print Documents for Reversal	Manage reversal of utility bill. Mistakes in the tariff can generate bills with wrong values. You can reverse such bills and create new bills using the adjustment reversal functionality. You select the print documents to be reversed is based on posting date, portion, billing transaction, rate category.
	Distributed Franchise Management (DFM) & Proof of Delivery	Manage certain business functions outsourced to franchisees such as Meter Reading, Bill Distribution, Payment Collection, Aggregate Technical & Commercial Loss (AT&C) Calculation.
	New Service Connection	Support the varied legal requirements for a new service connection.
	Energy Audit	Manage measures required to plug in technical and commercial energy losses and increase the efficiency of energy generation.
	Print Local Language	Support printing of invoice amount in multiple languages.
	Customer Mobile Services	Send important service information to your customers through Short Message Service (SMS). You can send important information related to billing and payment, new connection and move in, invoicing, outage.
Italy	eDocuments	Generate eDocuments. Store eDocument relevant details in contract account master data, and generate eDocuments.
Japan	Retail Localization for Japan	Maintain contract details required for Japanese Billing Period (JBP) calculations in CRM You can store additional contract details such as Actual Move-In Date and Actual Move-Out Date in SAP Customer Relationship Management (CRM) and make these details available in SAP Utilities through standard replication process.

Country/Region	Key Feature	Use
	Address enhancements	Maintain multiple international address versions in SAP Customer Relation Management (CRM). You can create and search address version in kana, in addition to the standard address version in kanji.

Poland	Budget Billing	Extend the standard budget billing for small and large customers.
		• Small customers - Calculate budget billing amounts using weighing key for small customers.
		• Industrial customers - Perform the following functions for industrial customers:
		  ○ Generate multiple budget billing requests in a billing period of one month
		  ○ Post partial bills that have an entry in accounts receivables, meaning that they are real and not statistical in nature

	Billing	Print Poland specific additional details in partial bill and settlement invoice. Calculate charge for excessive reactive power consumption.
	Billing Reversal	Perform adjustment reversal of settlement invoice in the standard way, and additionally perform Poland specific checks for adjustment reversal.
	Invoicing	Perform reversal of partial bills and adjustment reversal of settlement invoice for both industrial and small customers and create new documents for the same billing period.
Romania	Seal Management	Record the lifecycle of seals, from purchasing through issue to a responsible person and installation on a device to depreciation. You can display or change information, and create a statistical report about the seals.
Russia	Extension of Master Data for Reporting	Extend Master data objects such as business partners, contract accounts, contracts, and connection objects to store additional Russia specific data relevant for: • Statistics and reporting • Maintain voltage level not only for each installation but also for every device and register separately • Address data
	Energy Data Management (EDM)	Enhance settlement process to support Value replacement and Usage factor determination. Enhanced Value replacement processes enable you to replace missing or implausible profile values during the settlement process in energy data management Enhanced Usage factor determination enables you to calculate usage factors for synthetic load profiles.

Country/Region	Key Feature	Use

	Advance Payments/ Budget Billing	Perform budget billing for industrial customers and calculate budget billing amounts using weighing key.
		
		You can:
		
		• Maintain Budget Billing Parameters
		• Create Budget Billing Plan - The budget billing plan for BBIC consists one or more budget billing requests. You can create the budget billing requests:
		  ○ Manually during Move-In
		  ○ Manually by using transaction Create Budget Billing Request
		  ○ Automatically during Invoicing
		• Print the budget billing requests together with the relevant application forms.

	Benefits & Subsidies for Special Customers	Perform billing, invoicing and reporting of benefits. Maintain Czech Republic-specific data for personal benefit and use this data to apply discounts towards the bills of eligible persons, for example, veterans of different wars, invalids, families with numerous children.
	Distribution of Consumption	Bill customers who use utility sub metering. You can bill customers with the following setup of master meter and sub meters: • The master meter has a separate register for each time of use period • The sub meter has only one register to measure consumption in all periods
	Energy Consumption Sheet Report	Generate Energy consumption sheet. This document provides consumers with an invoice and contains detailed information about consumption and its cost for every meter register.
	Seals Management	Record the lifecycle of seals, from purchasing through issue to a responsible person and installation on a device to depreciation. You can display or change information, and create a statistical report about the seals.
	Shares of Consumption	Make changes for consumption share if required, for example, add or delete time slices, change the percentages, and use this information in billing. In Russia, one premise or group of connected premises that are equipped with one meter reading device and have a single contract with the service provider may be used for different purposes. In this case, the total consumption of a premise is divided to shares and each of that is billed by its own rate price, which is defined based on a special price agreement.
	Several Invoices for an Installation	Create several invoices for one installation. You can print separate invoices for different types of goods and services that the utility company provides for its customers.

Country/Region	Key Feature	Use
	Reporting	Prepare several reports, for example, legal reports and accounts receivables report: • RAO UES and State Statistical - Prepare forms such as Form 2-reg, Form 26-zkh, in the formats prescribed by law Reporting • Accounts Receivables Report - The accounts receivables report shows information about the receivables amount and their changes during a reporting period. You can display IS-U data in addition to the FI-CA data • Incasso Order and Payment Order Forms – Print the incasso order register and payment order forms. • Printing the Cash Desk Forms - Prepare and print separate forms for cash receipt (KO-1) and cash expenditure (KO-2). The system differentiates between cash receipt and cash expenditure. If the document is incoming payment (cash receipt), the system prepares form KO-1. If it is an outgoing payment (cash expenditure), the system prepares form KO-2.
	Transformer and Grid Losses	Report the amount of transformer and grid losses in billing documents separately. The system calculates transformer and grid losses using one of the following methods: • Calculate transformer losses and grid losses using fixed percentage rates • Calculates transformer and grid losses using a predefined or customer-specific logic
	Master Data	Use additional fields for business partners, contract accounts, contracts, and connection objects. Use enhanced installation groups.
	Device Removal and Replacement	Remove and replace devices. Support: • Technical removal - Remove device from the device location. • Billing-related removal- Terminate billing-related allocation of the device to the installation. • Full removal - Replace a device with another device, with the same function from the same or similar device category.
	Bill Printout	Print invoice smart forms with Russia specific values.

Country/Region	Key Feature	Use

Slovakia	Budget billing	Perform budget billing for industrial customers and calculate budget billing amounts using weighing key.
		
		You can:
		
		• Maintain Budget Billing Parameters
		• Create Budget Billing Plan - The budget billing plan for BBIC consists one or more budget billing requests. You can create the budget billing requests:
		  ○ Manually during Move-In
		  ○ Manually by using transaction Create Budget Billing Request
		  ○ Automatically during Invoicing
		
		Print the budget billing requests together with the relevant application forms.

	Invoice	Support Tax calculation during invoicing based on billing document including partial bills. Support VAT calculation if the invoicing document being created contains the partial bills to determine tax base amount for corresponding tax code in consumption invoicing. Adjust relevant data in print document and FICA posting document for consumption bill during the invoicing, before creation of the print document or FICA document.
Slovenia	eDocuments	Generate eDocuments. Store eDocument relevant details in contract account master data, and generate eDocuments.
Turkey		Maintain Turkey specific additional address data such as County and Township, as well as integration between SAP Customer Relationship Management (SAP CRM) and SAP for Utilities (IS-U) to enable use of these fields in both the solutions.
Ukraine	Subsidy	Maintain, process, report subsides. Create subsidy certificate and reimburse amounts of provided subsidies to the subsidy authority.
	Benefits	Maintain and process benefits data. Perform billing, invoicing and reporting of benefits.
	Energy loss in Transformer and Grid Losses	Report the amount of transformer and grid losses in billing documents separately. Calculate transformer and grid losses using one of the following methods: • Calculate transformer losses and grid losses using fixed percentage rates • Calculate transformer and grid losses using a predefined or customer-specific logic

Country/Region	Key Feature	Use

	Advance Payments/ Budget Billing	Perform budget billing for industrial customers.
		You can:
		• Maintain Budget Billing Parameters
		• Create Budget Billing Plan - The budget billing plan for BBIC consists one or more budget billing requests. You can create the budget billing requests:
		  ○ Manually during Move-In
		  ○ Manually by using transaction Create Budget Billing Request
		  ○ Automatically during Invoicing
		• Print the budget billing requests together with the relevant application forms.

	Meter Reading Creation	Create individual meter reading orders: • Create orders for aperiodic billing. • Create single orders for periodic billing if an order has to be created again due to a mistake, for example. Create mass meter reading orders: Create orders for several meter reading units simultaneously.
	Device Removal and Replacement	Remove and replace devices. Support: • Technical removal - Remove device from the device location. • Billing-related removal- Terminate billing-related allocation of the device to the installation. Full removal - Replace a device with another device, with the same function from the same or similar device category.
	Seals Management	Record the lifecycle of seals, from purchasing through issue to a responsible person and installation on a device to depreciation. You can display or change information, and create a statistical report about the seals.

4.3.3 Customer Engagement

Business Background

In the interaction center, SAP S/4HANA Utilities for customer engagement offers service capabilities for the utilities industry. The interaction center agents can use the interaction center as a central point of entry, to

search and manage master data as well as to carry out the traditional processes within the utilities industry such as meter reading, bill correction, move-in/out and more.

Key Features

The following table explains the key features available to the interaction center agent:

Key Feature	Use
Managing business partners and contract accounts	You can search, identify, view, change and create a new business partner and contract account.
Managing business partners and contract accounts	You can integrate the payment hub for the contract account.
Managing harmonized technical master data	You can manage harmonized technical master data.
Enhanced identification split screen	You can search for and visualize technical and business master data.
Enhanced identification split screen	You can use this feature to manage related business partners.
Interaction records	You can manage interaction records and clarification cases.
Business partner overview	You can provide a complete overview of a confirmed business partner.
Premise overview	You can provide a complete overview of a confirmed premise.
SAP HANA Free Text Search	You can use this feature to search for a premise or business partner using an alternative approach.
Fast move in/out	You can perform a fast move-in and move-out.
Fast move-in for an occupied premise	You can use this feature to perform a fast move-in and a fast move-out for an occupied premise.
Bill information and correction	You can view a list of bills and reverse incorrect ones.
Managing budget billing plans	You can view a budget billing plan or a view, and change or create a payment plan or payment scheme.
Financial inquiries	You can respond to a business partner's queries regarding account balance, account history and payments.
Collections	You can perform various functions related to the collection of outstanding payments owed by the business partner.
Managing meter readings	You can enter, estimate, correct or validate meter readings and view historical meter readings.

Key Feature	Use
Managing meter readings	You can release implausible meter readings and execute detailed meter reading validations.
Managing utilities sales contracts	You can start, end, change or cancel a utilities sales contract for a premise for a relevant business partner. The processes can also be executed for multiple selected utilities sales contract items.
Utilities sales contract overview	You can provide a complete overview of the utilities sales contracts for a confirmed premise for a relevant business partner. You can use configurable sorts and filters in the result lists.
Guided procedure for utilities sales contract management	You can use this feature to provide configurable guided processes and process steps in utilities sales contract management.
Summaries in utilities sales contract management	You can use this feature to provide configurable summaries and an overview of a customer in utilities sales contract management.
Integration of IS-U contracts into utilities sales contract management	You can use this feature to integrate IS-U contracts into utilities sales contract management. For each relevant IS-U contract a corresponding sales contract can be created automatically.

4.3.4 SAP Waste & Recycling

4.3.4.1 Waste Disposal Management

4.3.4.1.1 Logistics and Operational Service

4.3.4.1.1.1 Management of Service Object

4.3.4.1.1.1.1 Container Management

Business Background

The container is a kind of equipment which represents a physical service object of the storage and transportation of waste and provides toghether with criteria like the waste itself and the frequency of the service the basis for the billing of the individual services. All containers with the same characteristics are based on a container category. The container is assigned to the related service location and contains waste specific data. In order to ensure the proper handling of the containers the related container category can be assigned to the permitted vehicle types and material groups.

The container management includes procurement by using the integration of logistic processes as well as placement, replacement and removal on customer location which represents the service location.

The following features support the process:

Key Features

Key Feature	Use
Manage container data	Containers are configured by assignment of container specific master data. This includes container category and other data such as waste management data.
Installation of containers	Containers can be placed, replaced or removed from a service location. In case of changed attributes the container can be modified.
Inspection of containers	The containers can be inspected in different ways according to legal and internal requirements. Periodic replacements can be used to manage all devices that have to be replaced in a certain year.
Container groups	Container groups can be used if only the amount of containers on a certain service location is relevant. The related services such as placement and removal are only addressed to the container group and not to a specific one.
Customer allocation	The customer allocation to a certain container is enabled by assignment of the related contract information. Based on this the executed service on container level can be invoiced according to the contract agreement.
Service frequency	This feature is used in order to determine the interval in which the service for a container is executed such as container emptying service. The service frequency is only valid for a certain time slice. It's common to assign a reoccurring service to a container in the area of municipal waste collection. For commercial customers it's more common to assign a one-off service. A service is always assigned to a service area.

4.3.4.1.1.1.2 Cleaning Object Management

Business Background

A cleaning object represents an object in your system on which a cleaning or winter service can be take place. This can be a street, park or container for instance. Each cleaning object references to the regional structure and contains information such as address data, cleaning method and measurement parameters which are relevant for billing. More than one cleaning object can be allocated to a property.

The following features support the process:

Key Features

Key Feature	Use
Manage cleaning object data	This feature is used to create and maintain cleaning objects in the system and allocation of various data such as cleaning object category, address information, measurement points, cleaning method and so on. Beside this the allocation of a property to a cleaning object is required because the cleaning object cannot be directly billed.
Customer allocation	The customer allocation is enabled by assignment of the related contract information. Based on this the executed cleaning service can be invoiced according to the contract agreement.
Service frequency	This feature is used in order to determine the interval in which the service for a cleaning object is executed such as street cleaning service. The service frequency is only valid for a certain time slice. It's common to assign a reoccurring service to a container in the area of municipal waste collection. For commercial customers it's more common to assign a one-off service. A service is always assigned to a service area.

4.3.4.1.1.2 Route Management

Business Background

By the route management a regional grouping of containers and cleaning objects of one or more service areas can be undertaken. Different route types can be maintained such as dynamic or static routes. Static routes are common in the service areas of domestic waste or standard waste collection. Dynamic routes are more common in the area of container service and bulk waste service.

The maintenance of route data is a business process usually executed by the planners where the allocation of service objects can take place.

The following features support the process:

Key Features

Key Feature	Use
Route key attributes	This feature supports the assignment of up to 3 service areas and confirmation categories to the route. This helps to distinguish the routes according the service which are covered by the route and required confirmation values. In case of a required deeper differentiation the routes can be also defined for certain waste fraction and region.
Service frequency	This feature is used in order to determine the interval in which the service for a container or cleaning object is executed by this route. The service frequency is only valid for a certain time slice.
Target value assignment	This feature is used to assign various planned target values to the route such as distance, duration, no. containers or weight.
Resource assignment	This feature supports the assignment of resources such as vehicle and work center. Beside this also a shift and a timeframe can be assigned in order to define the period in which the route is serviced.
Waste disposal calendar	This feature enables the central control how service dates, falling on non-working days, are processed.
Capacity planning	This feature is used in order to define for a certain day and route the capacity particular for the bulky waste collection area. The capacity is measured in volume and weight. Additionally the daily capacity can be assigned to a certain element of the political regional structure.

4.3.4.1.1.3 Order Entry

Business Background

The order entry contains the waste disposal order and waste disposal order item creation for all kind of waste disposal and cleaning services. The waste disposal order contains all relevant data such as allocated resources and route information which are required for the service execution. The waste disposal order items are generated based on the services in the service objects. They are allocated to the waste disposal order and can contain customer and service object specific data including the provided service and related contract agreement.

The following features support the process:

Key Features

Key Feature	Use
Disposal orders	This feature supports the creation of disposal orders for the service execution on a certain container. Each order is referenced to a certain service area (e.g. domestic waste collection) and service type (e.g. container emptying).
Cleaning orders	This feature supports the creation of cleaning orders for the execution of cleaning or winter services on a certain cleaning object. Each order is referenced to a certain service area (e.g. winter service) and service type (e.g. scattering salt).
Transport orders	This feature is used to create waste disposal order items for container placement, replacement and removal for a service location.
Bulky waste orders	This feature supports the creation of bulky waste disposal order items. The related orders are assigned to a certain route and daily capacity. Based on the entered customer the most recent bulky waste collections for this customer are displayed. This can affect invoicing (e.g. 2 collections per year free of charge).

4.3.4.1.1.4 Order Scheduling and Execution

Business Background

The order scheduling is a daily operation in order to plan the order execution based on route and resource assignment. A planned order is the prerequisite for order execution.

The following features support the process:

Key Features

Key Feature	Use
Shift Planning	This feature supports the assignment of vehicles and work centers (driver, co-driver) to the waste disposal order which are responsible for order execution. Additionally information for the driver can be maintained as order text.
Route Allocation	This feature supports the route allocation to a waste disposal order if a route was not specified at waste disposal order creation.

Key Feature	Use
Order Output	This feature supports the selection of waste disposal orders based on various criteria and provide them as paper output or electronically as file. In both cases it has to be defined which fields of the waste disposal order are required. According to the business area different forms can be defined such as a route list or single orders.
Subcontracting	This feature supports to setup of system behavior in case of dispatching an order to a subcontracted vehicles or subcontracted waste disposal facilities.

4.3.4.1.1.5 Logistics Completion

Business Background

The logistical completion of waste disposal orders and waste disposal order items represents the final completion of the executed orders. All relevant data is collected which is required for the service invoicing to the customer and calculation of the internal costs per order.

The following features support the process:

Key Features

Key Feature	Use
Weighing data record	This feature is used in order to create a weighing record in completion on waste disposal order or item level. Here the weighing and all relevant logistic data can be entered. This feature is commonly used in case of waste deliveries to external instead of internal waste disposal facilities in order to gather all information.
Waste disposal order item completion	This feature is used in order to complete the specific order item to a service object. Therefore all relevant data out of the logistical execution are captured within the order item and stored for the further processes such as billing. In case of completion of transport orders the related container movement will be executed such as the container allocation to a service location or removal from a service location.

Key Feature	Use
Waste disposal order completion	This feature is used in order to complete the waste disposal order which contains all relevant resource data such as vehicle, staff, duration and distance. At order completion all relevant data out of the logistical execution is captured and stored on waste disposal order level. This data is required in order to calculate the internal costs of the used resources.
Subcontracting	This feature supports the setup and handling of subcontracted processes for transport and deliveries to external waste disposal facilities. Depending on the process type such as purchasing of transport services or selling valuable materials the required documents will be created after confirmation of weighing notes, waste disposal orders and waste disposal order items.
Integration of confirmation with sales and distribution	This feature supports the creation of debit memo requests at completion of waste disposal order items which is the basis for billing. Prerequisite is the contract assignment to the related service object such as container in advance of the waste disposal order item creation. These billing relevant confirmation values are stored in the related confirmation fields.
Integration of confirmation with inventory management	This feature supports the goods receipt creation out of the logistic completion in the background. Therefore it is required to create a weighing ticket out of completion and fill all relevant data such as waste material, receiving plant and storage location by entering the waste disposal facility and the related quantities.
Integration of confirmation with controlling	This feature supports the CO postings after waste disposal order completion. Based on the confirmation values the CO-data is prepared and posted. Therefore 2 options are available: the cost calculation on waste disposal order level based on route data and on waste disposal order item level.

4.3.4.2 Finance

4.3.4.3 Bill to Cash

4.3.4.3.1 Billing of Waste Disposal Services

Business Background

The billing of waste disposal services is performed for all types of customer groups such as commercial, industrial and municipal customers.

For municipal customers the billing takes place periodically for a defined period (such as monthly or yearly) or is triggered by a certain event such as move-out. The base for pricing is mostly the municipal statutes.

For commercial and industrial customers the billing takes place after fulfillment of an ordered service. The base for pricing is the related customer contract agreement and the defined service product which holds all ordered services and conditions.

The following features support the process:

Key Features

Key Feature	Use
Integration of SD contracts	This feature supports the integrated billing of commercial services at logistical completion. The contract holds all required information in order to invoice the agreed services. The contract itself has to be assigned to the service object.
Integration of IS-U contracts	This feature supports the integrated billing of municipal services based on a Utilities contract. The contract starts with the move- in of a customer at a certain premise and ends with the move-out date. The related services are invoiced based on the municipal statutes.

4.3.4.4 Waste Disposal Facility Management

4.3.4.4.1 Waste Disposal Facilities

Business Background

The waste disposal facilities are one of the important elements in the logistic process of waste management companies regardless whether it is the own or external waste disposal installation. There takes place all kinds of inbound and outbound deliveries including the typical waste treatment procedures. In order to map the waste disposal facilities all required information can be merged such as technical, personal and business

information. This includes the assigning of functional locations, allocating creditors/customers, allocating waste management partners and so on.

The following features support the process:

Key Features

Key Feature	Use
Waste disposal facility types	This feature is used to distinguish the waste disposal facilities according to the different types.
Waste disposal facility data	This feature is used to map relevant data for a certain waste disposal facility in the system such as waste disposal facility operator, address information, staff, sales and stock information. Depending on the usage within the logistical process also creditor/debtor information can be assigned. This is the base for creating all relevant documents for sales or purchasing activities to the related facility. Additionally it can be distinguished between internal and external facilities. External facilities are often used in case of not sufficient own storage capacity or if certain wastes are not permitted to deliver to the own facility. In this case the delivery and treatment will be purchased at external facilities.
Processes within a facility	This feature is used in order to map the treatment processes in the system such as sorting and splitting and is connected to stock postings. The stock quantities and values are updated in the process.
Operations log	This feature is used to automatically log all procedures within a waste disposal facility such us inbound and outbound weighing's, facility internal processes or malfunction reports. By selecting a certain waste disposal facility all related processes according to a certain date or date range are displayed and provide a transparent overview.

4.3.4.4.2 Weighbridge Operations

Business Background

The inbound and outbound deliveries at a waste disposal facility are mostly registered via a weighbridge where all relevant data will be entered such as customer, vehicle, material and quantities. The related weights are captured by a weighbridge and transmitted into the system. After checking all data and the delivery permissions are fulfilled the weighing transaction will be closed and the related stock updates and billing processes will be triggered depending on the weighing type.

The following features support the process:

Key Features

Key Feature	Use
Internal delivery	This feature is used in order to register material deliveries based on waste disposal orders or order items. All relevant data will be captured and the weight will be fetched from the weighbridge. If the weighing transaction is posted the weights will be transferred into the logistical order and the stock will be updated.
Internal transport	This feature is used in order to register material outputs based on waste disposal orders or order items. All relevant data will be captured and the weight will be fetched from the weighbridge. If the weighing transaction is posted the weights will be transferred into the logistical order and the stock will be updated. This feature supports business processes such as the internal order-related relocation of waste or deliveries to external parties (e.g. recycling or disposal companies companies) or the selling of valuable materials out of the treatment process.
External delivery	This feature is used in order to register contract or non-contract related material deliveries. All relevant data such as customer, license plate and/or contract information are registered. The weights will be captured and after posting the weighing transaction the stock will be updated and the invoice process triggered. The base for pricing is the contract or the price book.
External transport	This feature is used in order to register contract or non-contract related material outputs. All relevant data such as customer, license plate and/or contract information are registered. The weights will be captured and after posting the weighing transaction the stock will be updated and the invoice process triggered. The base for pricing is the contract or the price book.
Checking the scale load	This feature is used in order to define the calibration limits the minimum or maximum scale loads per weighbridge type and assign the relevant weighing information. When exceeding/falling below the calibration limits in the weighbridge operator gets information.
Checking the vehicle load (own vehicles)	This feature supports at checking the maximum load of a vehicle in order to avoid that the vehicle exceeds the load limit at leaving the waste disposal facility. During the weighing process it will be checked if the gross weight is within or without the maximum load of the vehicle.

Key Feature	Use
Yard list	This feature is used in order to get fast access to vehicles which are still within the waste disposal facility and the related weighing transaction. An entry in the yard list will be generated based on the first weighing on the related weighing transaction.
Cash journal integration	This feature is used in order to register incoming or outgoing payments regarding to a weighing transaction directly in the cash journal.
CPD customer integration	This feature supports the deliveries by a one-time customer. A CPD customer can be assigned to the weighing transaction. Based on this the customer address can be assigned in order to provide the invoice with the correct data.
Weighbridge interface	This feature is used in order to connect external weighbridge devices with the system. The technical parameters.

4.4 Financial Services

4.4.1 Banking

4.4.1.1 SAP Deposits Management for Banking, SAP S/4HANA Edition

Business Background

SAP Deposits Management for Banking, SAP S/4HANA edition enables you to manage current accounts, fixed-term deposits, and savings. It offers various functions to support the lifecycle of deposit contracts.

Key Features

The following table explains the key features available:

Key Feature	Use
Management of master data	You use this feature to manage deposit contract master data (such as the creation, changing, and display of deposit contracts). Examples of deposit contract master data include: • General data such as account number, account currency, and account product • Financial conditions (such as interest, value dates) • Business partners assigned in different roles to the deposit account (such as account holder or authorized drawer)
Monitoring of funds payable and receivable	You use this feature to monitor funds payable and receivable between banks and their customers.
Support of business operations	You use this feature to manage various business operations such as account management (the creation of direct debits, product definition, check management, and cash concentration, for example).
Management of outgoing and incoming payments	You use this feature to manage outgoing payments (such as credit transfer) and incoming payments (such as direct debit).
Support of accounting processes	You use this feature for accounting processes for debits such as the creation of standing orders.

4.4.1.2 SAP Loans Management for Banking, SAP S/4HANA Edition

Business Background

SAP Loans Management for Banking, SAP S/4HANA edition enables you to manage both simply structured loans, such as consumer loans, and complex loans, such as mortgage loans. It offers various functions to support the lifecycle of loan contracts.

Key Features

The following table explains the key features available:

Key Feature	Use
Management of master data	You use this feature to manage loan contract master data (such as the creation, changing, display, and archiving of loan contracts). Examples of loan contract master data include: • General data such as contract number, contract currency, and commitment capital • Financial conditions (for interest payments, repayments, or charges, for example) • Business partners assigned in different roles to the loan contract (such as main borrower or alternative payer)
Calculation of cash flows	You use this feature to calculate cash flows based on the loan contract master data.
Support of business operations	You use this feature to manage various business operations such as disbursement, waiver, write-off, borrower change, or payoff.
Management of outgoing and incoming payments	You use this feature to manage outgoing payments (such as disbursements) and incoming payments (such as interest payments or repayments). It provides functions to support incoming payment distribution.
Support of accounting processes	You use this feature for accounting processes for loans such as the creation of debit items.

4.4.1.3 SAP Collateral Management for Banking, SAP S/4HANA Edition

Business Background

SAP Collateral Management for Banking, SAP S/4HANA edition provides banks with the front- and back-end support they need for collateral handling and risk mitigation. It offers functions to maintain, manage, and monitor the use of collaterals.

Key Features

The following table explains the key features available:

Key Feature	Use
Central source system for collateral management	The component provides the benefits of a stand-alone application as well as software that integrates with operational SAP transaction systems (loans, deposits), customer information management, risk management, document management, and reporting.
Process support for centralized collateral management	The component manages objects and receivables. It provides integrated object-management features that can store and value data for various collateral objects, such as real estate or securities. It also supports the connection with external collateral-object systems. In addition, the component enables you to retrieve and use receivables data, such as loan information, that is managed either in SAP systems or third-party systems.
Management of collateral constellation and calculations	You can use this feature to minimize manual processing tasks and to provide a flexible way of mapping simple and complex relationships between receivables, collateral assets, collateral providers, and collateral assignees. You can use the software to support calculations such as collateral cover, collateral distribution, loan-to-value ratios, calculation of free collateral, and collateral shortfalls.

4.4.1.4 SAP Reserve for Bad Debts for SAP S/4HANA

Business Background

SAP Reserve for Bad Debts for SAP S/4HANA (FS-RBD) enables you to create, post, and manage impairments (risk provisions). It supports the management of single risk provisions as well as flat-rate risk provisions.

Key Features

The following table explains the key features available:

Key Feature	Use
Single risk provision (specific impairment)	FS-RBD enables you to create proposals for a single risk provision that can be adjusted by the credit officer. The proposals are structured on the basis of predefined institute-specific rules. The component also supports the expected cash flow approach that allows you to adjust your single risk provision with many different functions, such as special payments, expected revenue or the liquidation of collaterals. You can model *single risk provision* at the level of the risk units *Contract*, *Partner*, and *Finance Project* using the following procedures: • **Expected cash flow procedure** This procedure enables single risk provision to be created in parallel for two financial accounting standards. The risk provision will be calculated by GAAP-specific book values combined with the net present value of the modeled cash flow expectation. FS-RBD offers extensive functions for modeling the expected cash flow – based on contractual cash flows, special payments, and the expected revenue from the liquidation of collateral. This procedure particularly supports the following: ○ Consideration of probability-weighted scenarios ○ Impairment management for on-balance-sheet and off-balance-sheet transactions • **Outstanding and open item procedure** Risk provision is managed differently according to capital (effective capital, possibly reduced by applicable collateral values), open items for interest, and open items for charges.
Impairment Processing Extension	You can use the *Impairment Processing Extension* procedure (IPX procedure) to calculate, post, and manage impairments for on-balance-sheet and off-balance-sheet transactions. It features a flexible process framework for modeling loss-rate based impairment methods. The extension is specially designed to handle high data volumes using parallel processing procedures. • The impairment is calculated at single-transaction level • Risk provisioning can also be processed using the dual GAAP approach. The delta procedure as well as the withdrawal procedure are supported.
Flat-rate risk provision (general/collective impairment)	FS-RBD supports the flat-rate value adjustment procedure, which adapts the risk provision for credit transactions that are not included in the single risk provision by a percentage defined by different risk indicators. Risk provision is managed at the level of single transactions.

Key Feature	Use
Real-time connection of financial accounting and reporting	When the risk provision is posted, the system immediately transfers all balance-sheet-relevant data to financial accounting. This real-time connection means that data is available for internal and external reporting in an instance.
Seamless integration	The component contains interfaces that enable you to use both SAP systems and non-SAP systems as a source of data. Depending on the risk provision method and the analysis horizon, the source systems (SAP and non-SAP) are connected using standard online interfaces (extractors) or standard open interfaces.

4.4.1.5 Country/Region-Specific Features in Banking

Key Features

The following table explains the key features available for the countries/regions in Loans Management:

Country/Region	Key Feature	Use
Hungary	Interest on Arrears	You can calculate interest on arrear amounts on a regular basis, as well as the posting of these amounts to special G/L accounts that are excluded from the balance sheet and the reset posting for these accounts on the following day. You can also reverse the posting and the calculation and you can track the statuses and details of all these process steps.
	Interest Suspension	The amounts of suspended interest or interest-type revenues can be posted off-balance and you can then report the information about these suspensions to the Hungarian National Bank (MNB). The obligation of suspension must be checked and performed on a daily basis during the year and also once at the end of the year for balance year preparation.
	Debt Transfer	In case of debt transfer, a financial institution purchases a loan contract from another bank at a price that is usually lower than the original contract value. This feature complies with special legal requirements for posting debt transfers.

Country/Region	Key Feature	Use
	Off-Balance Posting	You can post obligations derived from a loan contract, such as available loan amount or other commitments, to off-balance accounts. This means that from the time of the contract offer till the end of the contract, you must post any contingent liabilities off-balance and keep track of their changes. This feature also ensures the management of itemized commitment in compliance with the law. In case of itemized commitment, bank customers can draw down the loan amount agreed in the loan contract gradually, in portions.
Israel	Annexing	Enables annexing calculation of loans given or received, to the rate of exchanges (currencies) or indexes. The calculated annexing difference is added to the loan's cash flow against each repayment, as a different repayment, complementary to the nominal (base) amount.

4.4.2 Insurance

4.4.2.1 Policy Management for Insurance

Business Background

Policy Management for Insurance allows you to manage insurance contracts. You can map the life cycle of a contract, starting from the creation of an application, through policy issuance and ongoing contract maintenance, right up to the reversal of the contract.

The following personal insurance lines of business are supported:

- Life
- P&C
- Auto

To support group insurance businesses you can create and maintain master policies. You can use a master policy to bundle multiple individual policies.

Key Features

The following table explains the key features available:

Key Feature	Use
Issue Policy	You use this feature to create new applications and issue it to generate a policy.
Change Policy	You use this feature to change policy characteristics through the lifecycle of a policy.
Reverse Policy	You use this feature to reverse a policy.
Update Policy	You use this feature to bring a policy through the lifecycle of a policy, like performing adjustments or collection of premiums.
Create Master Policy	You use this feature to create a master policy.
Change Master Policy	You use this feature to change a master policy.
Reverse Master Policy	You use this feature to revert a master policy.

4.4.2.2 Insurance Product Engine

Business Background

Key Features

The Insurance Product Engine msg.PMQ allows you to manage the lifecycle process of your insurance products – from designing new products up to running existing products. The product engine consists of a design time environment for product modeling and a runtime environment for product operation.

Key Feature	Use
Product Modeling	You use this feature to create and maintain insurance products for the supported insurance lines of business. An insurance product consists of product defining objects (e.g. product attributes and tables), mathematical and insurance calculations. The design time environment comprises test and debugging functions. When you have finished the design process, the product data can be used in the runtime environment.

Key Feature	Use
Product Operation	You use this feature to perform tariff and insurance calculations. These services can be consumed by different insurance applications, such as Policy Management for Insurance.

4.4.2.3 Claims Management

4.4.2.3.1 Claim Lifecycle

Business Background

You use Claim Lifecycle to automate and manage the entire claims process, from first notification of loss to claims adjustment and financial reporting. The following lines of business are supported:

- P & C insurance, including the following lines:
  Property (home contents)
  Liability
  Automobile
- Health insurance
  Private health insurance
  Statutory health insurance
- Life insurance
- Care insurance
  Private care insurance
  Statutory care insurance
- Workers Compensation

Key Features

The following table explains the key features available:

Key Feature	Use
Claim Notification	You use this feature to record a notice of loss received through different channels and create a claim. You can capture first relevant information and evaluate the claim. The system supports you with an automated claim handler assignment.

Key Feature	Use
Claim Processing	You use this feature to capture all relevant claim data supported by a Structured Facts Capture (SFC) and a Business Rule Framework (BRFplus) tool. All required business processes like investigation, evaluation, negotiation, litigation, subrogation, settlement, and archiving are supported.

4.4.2.4 Insurance Billing and Payments

4.4.2.4.1 Billing and Payments

Business Background

You use Billing and Payments to perform all collection and disbursement tasks across different lines of business. These tasks include open item accounting, payment processing, incoming payment processing, correspondence, and dunning. You can also map broker accounting and coinsurance business.

Billing and Payments allows business process automation and integration with operational insurance systems and back-office applications such as the general ledger.

Key Features

The following table explains the key features available:

Key Feature	Use
Billing and Collections	You use this key feature to integrate billing and collection activities. This enables you to centralize billing and collections. As a result, payment handling is more accurate and credit control is improved.
Disbursements	You use this key feature to automate and integrate front-office and back-office processes and systems across lines of business. Supporting a single, integrated system to run payment handling decreases the need for manual transactions and associated costs.

Key Feature	Use
Collections and Disbursements for Reinsurers	You use this key feature to centralize collections and disbursements in a modern technology platform. Integration with general ledger systems ensures almost non-disruptive, end-to-end business processes that make reinsurance business process automation possible and reduce transactional costs. When reinsurance organizations consolidate collection and disbursement activities, they drive accurate payment processing, credit control, and improved customer satisfaction.

4.4.2.5 Compensation Operations

Business Background

You can reproduce sales structures and set up flexible incentive systems. You use standard agreements as the basis for creating individual agreements and settling commission cases.

Key Features

Key Feature	Use
Compensation Planning	You use this feature to design a consistent remuneration plan, break down your company's strategy to specific sales targets, and cascade plan changes. You can easily build new organizations into its sales composition and integrate compensation for the sale of newly designed products.
Sales Portfolio Assignment	You use this feature to assign field services to customer segments and manage business portfolio relationships, as well as transfer assignment from one agent to the other.
Sales Force Accreditation	You use this feature to keep employees up-to-date on the latest rules and regulations by verifying sales force qualifications and linking sales force credentials to compensation.
Compensation Operations	You use this feature to align internal and external sales targets with a company's overall strategy - and automates sales force compensation for meeting those targets.

4.4.2.6 Statutory Reporting for Insurance

4.4.2.6.1 Statutory Reporting for Insurance

Business Background

You use Legal Statutory Reporting for Insurance to meet statutory requirements for quarterly reporting and reporting on premium reserve funds and also to create reports for capital investments according to BerVersV and then send to BaFin.

Key Features

The following table explains the key feature available:

Key Feature	Use
Statutory reporting requirements for capital asset management	You use this feature to deliver required reports in specified layouts or electronic formats that correctly chronicle risks and portfolio data to national and international authorities. You can create forms or electronic formats from actual subledgers. Statutory reports can be preconfigured with relevant data on reporting layouts for country/region-specific or international versions.

4.4.2.7 Country/Region-Specific Features in Insurance

Key Features

The following table explains the key features available for the countries/regions:

Country/Region	Key Feature	Use
Brazil	Payments	You can carry out the following features: • Calculate withholding tax for payments in Insurance • Manage FEBRABAN payment files
Netherlands	Gross to Net Calculation	This feature enables you to calculate the correct net amounts for the insurance payments such as pension benefits that are are subject to taxes, social insurance contributions, garnishments or similar deductions.

Country/Region	Key Feature	Use
	GBA Messages	You can process messages that you receive from or send to the Municipal Personal Records Database (Gemeentelijke Basis Administratie, GBA).
Turkey	TRAMER (Motor Third Party Liability Insurance Information Center)	You can report every claim for car accident to TRAMER for auditing purpose. Due to difference in the required data for various claim types, TRAMER defines different data structures for submitted XML files.

4.5 Public Services

4.5.1 Defense and Security

4.5.1.1 Material Planning and Operations

4.5.1.1.1 Force Generation

Business Background

Building forces using a capability-centric table containing organization and equipment (TOE)

- Foundational work for force element simplification and optimization.
- Extendable tables for organizations and equipment.
- Use the flexible material planning object (FMPO) to plan and manage your authorized material.
- Use capabilities and mission essential task lists (METL) to maintain your capability and task-based catalog.

Key Features

The following table explains the key features available:

Key Feature	Use
Provide a foundation for the new "force element" concept	• Plan, create and then organize your force structures according to your requirements. • See an overview of the hierarchical relationships between organizational units. • Use reference structures as a template, which enables you to adjust your organizational structure quickly and flexibly. • Provide a means of organizing the changes to be made to your force structure.
Plan capabilities	• Define defense capabilities for your organization. • View capabilities and mission essential tasks in hierarchies. • Represent defense capabilities by assigning them to force elements.
Plan material	• Flexibly define and manage material planning objects, models and accompanying parts. • Organize and view flexible material planning objects in a hierarchical structure. • Represent material requirements by assigning flexible material planning objects to force elements.
Plan personnel	• Define and manage positions. • Assign jobs, qualifications, and persons to positions. • Represent personnel requirements by assigning positions to force elements.
Plan scenarios	• Use scenarios to structure your capability-based planning and development processes. • Collect different objects related to the capability and actual active force elements (or reference force elements) and compare different scenario alternatives that could possibly fulfill the requirements. • View the crucial personnel, material and training requirements (job, FMPO, METL) linked to each required capability code in a scenario alternative task. This allows the planner to evaluate whether the identified unit is now ready and prepared to perform the operation at hand.
Enhanced authorization capabilities for defense and security organizations	• Protect the access to force elements, capabilities, capability statements, and flexible material planning objects by assigning sensitivity values • Protect the access to force elements, flexible material planning objects, and products by using context-based structural authorizations

4.5.1.1.2 Force Deployment

Business Background

Support military troops with enhanced military planning and budgeting, troop relocation and readiness reporting

- Enhance military planning and budgeting.
- Coordinate organizational, personnel, material, financial, and budgeting processes.
- Support troop relocation, IT system setup, and readiness reporting.

Key Features

The following table explains the key features available:

Key Feature	Use
Plan operations & exercises	• Define and manage dedicated force element structures based on operation and exercise usage types, including information about the operation, its relationships and rotations • Define and manage operational and exercise force elements with the relationship, rotation assignment, operational position and provider assignment • Define and manage operational and exercise positions with the relationship, rotation and operational personnel assignment • Optimize the "best" match candidate for each position and check the rotation fulfillment for force elements

4.5.1.2 Military Supply Chain

4.5.1.2.1 Defense Equipment Management

4.5.1.2.1.1 Defense Inventory and Movement Management

Business Background

Manage storage and warehousing with transportation in supply replenishment

- Consolidate authorized material objects
- Enhance authorized personnel and finance
- Extend the organization and equipment tables

Key Features

The following table explains the key features available:

Key Feature	Use
Compare authorized with actual materials	• Determine the authorized materials and the actual equipment levels for force elements and make a detailed comparison. • Use the comparison as a key tool for the replenishment and procurement of authorized materials, specifically the non-consumable goods (NCGs).
Manage personal and functional equipment	• Manage the issue and return of personal and functional equipment • Monitor the status of personal and functional equipment
Planning of provisions for non-consumables	• Manage the planning for non-consumables • Trigger the planning process for non-consumable items that are required by a force element structure
Identify material by long manufacturer part number	• Maintain the long manufacturer part number (up to 60 characters) for a material

4.5.1.2.1.2 Defense Maintenance, Repair, and Overhaul

Business Background

Maintain and monitor assets ranging from small to complex assets

- Foundational work for work orders
- Enhanced source-to-pay for MRO
- Engagement of total workforce
- Predictive purchase order deliveries
- Enabled incident management with asset recording
- Enhanced maintenance item search

Key Features

The following table explains the key features available:

Key Feature	Use
Plan maintenance	• Define maintenance capabilities for your organization. • Represent maintenance capabilities for a unit by assigning them to force elements. • Streamline the maintenance process by defining relationships between force elements.
Display status board	• Display the status of one or multiple technical objects, from a high-level status overview for a complete fleet to the detailed analysis of outstanding maintenance activities for a specific object.
Manage platforms	• Manage platforms by creating hierarchies of platform groups and platform codes and assigning relevant business objects, such as materials, WBS elements or cost centers to platform codes. • Monitor and analyze the platforms, for example in the areas of cost accounting or maintenance activities.
Define equipment as being critical	• Define components within a technical object structure as critical equipment, thereby improving insight into the technical status of the overall technical object.

4.5.1.2.2 Defense Replenishment

4.5.1.2.2.1 Defense Replenishment and Planning

Business Background

Plan and execute replenishment of consumables and equipment

- Enabled planning and execution for the replenishment of consumable goods and defense equipment
- Enabled logistics and fulfillment for warehousing, transportation, and distribution processes
- Enabled combat readiness for service members
- Prioritized supply planning and execution
- Enhanced management of storage, warehousing, and transportation for supply replenishment

Key Features

The following table explains the key features available:

Key Feature	Use
Manage material allowances	• Enable force element structures to request authorized materials or products for a time period without influencing the current force planning. • Based on the allowance requests, execute a preliminary planning process in which quantities are limited for force element structures over a time period. The result is available in the force planning process.

4.5.1.2.3 Defense Replenishment Planning

4.5.1.2.3.1 Relocation Planning

4.5.1.2.3.1.1 Defense Relocation Planning and Execution (S/4 OP)

Business Background

Relocate troops for operations and exercises

- Enhanced military planing and budgeting
- Coordinates organizational, personnel, material, financial, and budgeting processes
- Supports troop relocation, IT system setup, and readiness reporting

Key Features

The following table explains the key features available:

Key Feature	Use
Plan relocations	• Define and manage relocation projects and relocation steps
Plan material for relocations	• Plan and prepare authorized material for relocations • Create the necessary documents for the relocation of the material

4.5.1.3 Asset Management

4.5.1.3.1 Asset Operations and Maintenance

4.5.1.3.1.1 Disconnected Operations

4.5.1.3.1.1.1 Disconnected Operations (S/4 OP)

Business Background

Support distributed mobile maintenance planning and execution

- Foundational work for distributed maintenance
- Enabled mobile maintenance planning and execution
- Enabled mobile materials management planning and fulfillment
- Enhanced plan execution for IT operations
- Enhanced warehousing for defense

Key Features

The following table explains the key features available:

Key Feature	Use
Run a distributed S/4HANA system landscape (central S/4HANA system and S/4HANA strategic servers), supporting the operation in communication-challenged environments	• Enable data distribution between systems for selected business objects in the areas of maintenance and supply • Execute selected cross-system processes in the areas of maintenance and supply • Make use of change protection functionality to ensure data consistency • Apply the new subscription concept to define the scope of data to be distributed to a target system • Trigger the initial data load from the central to a target system • Perform an automatic delta load between the central system and strategic servers for the new or updated data • Provide tools that can be used to analyze the status of data distribution

4.5.1.4 Explosives Management

Business Background

In large warehouses, the goods receipt, storing and issuing processes are generally complex. They become even more complicated when the warehouse deals with explosive materials, because the same processes now need to handle additional safety, accountability and compatibility requirements.

By defining an explosive storage location in a warehouse, you create the physical storage facility where the explosives are stored. Each location represents one complete physical building, such as a bunker, building and so on, where the compliance checks (net explosives weight limit and compatibility check) apply. The Planograph is a visual tool that acts as one central source of information to obtain any information about a specific explosive storage location and the materials stored there.

Key Features

The following table explains the key features available:

Key Feature	Use
Define an explosive storage location	• Model the location with detailed information, such as the plant, company code, business area, warehouse number, storage type, storage section, storage bin and flexible bin area to which it is assigned. • Maintain the location's address and geographic coordinates to identify its precise position as well as the physical dimension of the explosive storage location, explosives limit license for hazard codes and special areas at the explosive storage location
Set compliance checks to manage the explosive materials in the warehouse for safe storage	• Configure the hazard division and compatibility group (CG) codes based on various technical guidelines for dangerous goods • Maintain the compatibility mix matrix and compatibility check algorithm to ensure that only allowed material combinations are stored together, as well as algorithms to calculate the net explosive weight for an explosive storage location. • Integrate compatibility and net explosive weight check algorithms in EWM processes to stop explosives storage and movements within the explosive storage location
Visualize an explosive storage location (Planograph)	• Visualize the physical explosive storage location at storage bin level or stock level. • Monitor the compatibility status of the different explosive materials that are to be stored at the same explosive storage location. • Track the aggregation of the net explosive weight (NEW) for all explosive stocks stored at the explosive storage location and the NEW limit of the material that is to be stored. • Gain an insight into the quantity of explosives for each hazard division.

4.5.2 Higher Education and Research

4.5.2.1 Student Information Systems

4.5.2.1.1 Application and Admission

Business Background

Improve the student application process by enabling students to submit applications online using the Internet Service Request (ISR) framework. The admission decision framework in Student Lifecycle Management guides students through the application procedure for courses they are interested in, and allows them to track the status of their applications, even on mobile devices. This caters to the students' needs, while the educational institution also benefits from a reduction in the amount of time, effort, and money required to run the entire admission process.

Key Features

Key feature	Use
Create and manage your admission forms	Create and edit forms easily by customizing admission form templates to suit your requirements.
Manage your forms flexibly	Use a generic form designer to create forms for various processes. Reports for creating standard configuration are also provided.
Track students application	Integrate your admission process with self-services, enabling students to track the status of their applications and requests that needs to be fulfilled.
Review applications on multiple levels and manage workflow	Enable multiple parties to review applications in an automated workflow. Manual application processes are also supported and can be tracked.

4.5.2.1.2 Curriculum Management

Business Background

Curriculum managers can use personnel management data and finance data to create an academic curriculum that is tied to the overall organizational structure of educational institutions, including finances. As a result, they can generate a catalog that ensures all processes run smoothly. They can maintain and manage the

programs offered by your university in the program catalog, manage program dates and deadlines in the academic calendars, and map and manage the program rules using rule containers.

Key Features

Key Feature	Use
Manage course or program catalog	Use course or program catalogs to allow students to book, change, or cancel their course bookings online. You can also specify the requirements that students must meet to complete the academic programs.
Create requirements catalog	Curriculum managers can define both simple and complex requirements for use in different catalogs. They can also specify general requirements in one catalog, while outlining program-specific requirements in separate catalogs.
Manage requirements catalog	Manage the requirements catalog for admission to a course, or to obtain a degree.
Track degree requirements	Students can run what-if scenarios to view requirements for a program they are considering, including courses eligible for transfer if they were to change programs.

4.5.2.1.3 Grading and Advising

Business Background

Monitor grades, course attendance, and other significant data to track a student's progress towards degree or program completion. Faculty members can use integrated grading to record student exam grades based on course-specific grade scales, and they can use course registration processes to verify course attendance.

Key Features

Key Feature	Use
View grades	Students can review exam grades and submit grade-change requests if necessary. They can view final grades and request that official copies of transcripts be sent directly to themselves or to third parties.

Key Feature	Use
Monitor academic progress	Students can monitor their academic progress and assess their completion status.
Academic advisors	Create course lists reflecting student degree requirements. Integrated booking capabilities allow students to register for suggested courses. You can also group students according to program.
Maintain Attendance	Faculty members can maintain attendance for the courses.
Student Retention	Advisors can get a broad view of their students' progress to increase student retention.

4.5.2.1.4 Progression and Graduation

Business Background

Administrators can view academic progress indicators, such as a student's grade-point average or the current number of achieved credits, at any point during the enrollment year.

Key Features

Key Feature	Use
Monitor student progress	Administrators, advisors, and teaching personnel can view a student's progress and measure it against stage-specific requirements. For example, pre-clinical studies must be completed before clinical studies can begin. They can also monitor student performances using Student and Study Analysis to help students progressing towards graduation. In addition, they can receive early warnings which include advanced warnings about underperformance in their students' academic progress.
Monitor graduation process	Administrators can track applications for graduation and evaluate results of degree audits to support the graduation process. They can also track a student's progression towards, or completion of, graduation.

Key Feature	Use
Track degree requirements	Students can run ‘what-if’ scenarios to view requirements for a program they are considering, including courses eligible for transfer if they were to change programs.

4.5.2.1.5 Student Administration

Business Background

Improve the management of personal student data and academic achievements. SAP software offers student services and administrative functions, ranging from student application processing to the development of individual study plans and time tables. Educational institutions can streamline processes across administrative and service areas by integrating course management systems and other third-party applications.

Key Features

Key Feature	Use
Manage student data	Maintain and manage student data efficiently.
Manage requests	Manage all types of request service for the university and students. For example, leave of absence or request for part-time study

4.5.3 Public Sector

4.5.3.1 Public Sector Management

4.5.3.1.1 Funds Management

4.5.3.1.1.1 Budget Maintenance

Business Background

The maintenance, management, and monitoring of public funds. You may transfer approved budgets to other projects and departments and monitor and track changes throughout the entire budget cycle.

Key Features

The following table explains the key features available:

Key Feature	Use
Map your budget structure	Use the budget structure to define which of your organizational units, sources of funding and other account assignments are used to represent and control your budget. You can use a budget address to control which of your account assignment elements become key elements of your budget process.
Upload planning data	Upload approved budgets to the system
Enter budget data and update as required	You can • Use budget entry documents to enter and update approved budgets. • Use the budget entry documents to act as an audit trail, allowing you to track changes to your budgets and enter descriptions or explanations for each change. • Set up workflows to ensure that each change to your budget must be approved.
Release budgets	Control the use of available funds by releasing your budget in tranches throughout the fiscal year or lifetime of the fund.
Allow budget increases from revenue	Define the rules for when and how a budget increase based on revenue is permitted.
Define cover eligibility	Define rules for the cover eligibility of your funds management budget to cover over-expenditure in one budget by allowing additional budget to be made available from another source.
Key figures	You may define key figures by filtering specific attributes of your budget data. The resulting amounts can be used to • Release your budget data • Transfer budget between budget types • Compare values in reporting
Status management	You can: • Subdivide the budget process into individual budgeting phases; each phase is represented by a status. • Regulate the permitted budget processes and user authorizations for each budgeting phase.

Key Feature	Use
Reporting	Use reports to support the budget maintenance process including, but not limited to, reports that allow you to do the following: • Get a budget overview • Compare budget versions • Evaluate budget information using key figures • Get an overview of revenues increasing the budget

4.5.3.1.1.2 Budget Execution

Business Background

The integration of operational processes and accounting processes with maintained budget.

Enables real-time and parallel budget controls that can operate on multiple levels, helping to monitor and control funds while reducing procurement and operating costs.

Key Features

Key Feature	Use
Map your posting structure	Use master data elements to map the budget structure and reporting needs according to your organizational units and functional viewpoints. Mapping a posting structure for your account assignments allows you to determine how your commitment and actual postings are represented in your budget structure. They can be mapped on a different level to your budget addresses and allow you flexible control of your budget data.
Budget availability checks	You can: • Monitor and compare budget values with commitment and actual budget values. • Define single or multiple budget availability control checks to run simultaneously. • Set a threshold for the available budget. • Define what will happen should budget consumption reach or surpass this threshold.
Earmarked funds	Earmarked funds are documents that allow you to reserve part of the available budget for expected revenues or expenditures.

Key Feature	Use
Update operational processes that commit budget	All information relevant for the commit budget process is recorded, allowing you to refer back to the original business process or document, or even to a preceding step in the process that commits budget (if it exists).
Update operational processes that consume budget	All accounting information relevant for calculating the budget consumption is recorded. This enables you to see, for example, the movement of goods, the status of invoices and payments, and allows you to check budget availability.
Requests	Requests support an approval process allowing a separation of duties between recording and posting a financial document.
Cash ledger	A separate cash ledge supports Cash-Basis Accounting (CBA), and is a complete, balanced set of accounts that takes expenses and revenues into account, but only at the time that cash is paid or received.
Budgetary ledger	The budgetary ledger enables simultaneous posting of budget maintenance and execution documents. It supports the creation of financial statements for governmental reporting.
Reporting	Use reports to support the budget execution process including, but not limited to, reports that enable you to do the following: • Get a budget execution overview • Get an overview of budget availability • Evaluate budget execution information using key figures • List the operational transactions affecting budget execution • Compare fiscal years • Display commitment and actual line items • Compare budget lines versus commitment and /or actual line items • Display earmarked funds journal

4.5.3.1.1.3 Budget Closing and Financial Reporting

Business Background

The planning, standardizing, scheduling, and monitoring of financial and budget close activities.

Key Features

Key Feature	Use
Manage open remaining commitments and budget committed at the end of the fiscal year	You can: • Close out open commitments in the old fiscal year. • Transfer *remaining commitments to the new fiscal year (if legally permitted). *Commitments with a full or partial amount that has not reached the final stage of execution, and which can be invoiced or paid, depending on the legal requirements. • Transfer the committed budget along with the carried forward commitments It is also possible to have an approval process associated with this transfer.
Manage residual budget at the end of the fiscal year	You can: • Calculate residual budget. • Transfer residual budget to new fiscal year (if legally permitted). It is also possible to have an approval process associated with this transfer.
Reconcile budgetary accounting	You can reconcile budgetary accounting data with financial and managerial accounting
Key figures	You can use key figures for a number of processes including, but not limited to: • Calculating the residual budget for the carryforward of budget data
Reporting	Use reports to support the closing process and provide financial reporting including, but not limited to: • Monitoring of the commitment carry forward • Cash flow reporting • Cash basis reporting

4.5.3.1.2 Grants Management for Grantee

4.5.3.1.2.1 Sponsor Management

Business Background

Adapt a grantee's organizational structure to meet a sponsor's business requirements.

Help users manage grant information, and provide status indicators of the grant process according to the administrative requirements of their sponsors. Coordinate funding throughout the grant lifecycle, restrict

specific grant posting objects, and control transactions based on grant status. Users can maintain master data components for managing, controlling, and reporting based on the sponsor's administration requirements.

Key Features

The following table explains the key features available:

Key Feature	Use
Define sponsor master data	Define a grant sponsor by defining all of the default rules the sponsor expects for reporting and grant execution.
Document sponsor communication	Track all documentation regarding the sponsor and the specific grant including correspondence, documents, and so on.
Document and enter all budgetary agreements with the sponsor for each grant agreement	Document and enter all budgetary agreements with the sponsor for each grant agreement.
Release budgets	Control the use of available funds by releasing budget in tranches throughout the fiscal year or lifetime of the grant based on sponsor defined rules.
Reports	Report on all attributes of a specific or series of sponsors and grant agreements. Grants Management keeps all information based on the sponsor perspective, that is, the sponsor's currency, time frames, fiscal years, and so on.

4.5.3.1.2.2 Budget Management

The maintenance, management, and monitoring of grant budgets. Approved budgets can be transferred to other sponsored programs and cost categories, and changes can be monitored and tracked throughout the entire budget cycle.

Key Features

The following table explains the key features available:

Key Feature	Use
Enter grant budget data and update as required	You can: • Use budget entry documents to enter and update approved grant budgets. • Use budget entry documents to represent budgets in the sponsor's currency and fiscal year. • Use the budget entry documents to act as an audit trail, allowing you to track changes to your budgets and enter descriptions or explanations for each change • Set up workflows to ensure that each change to your budget must be approved.
Release grant budgets	Control the use of available funds of a grant by releasing your budget in tranches throughout the fiscal year or lifetime of the fund.
Allow grant budget increases from revenue	Define the rules for when and how a budget increase based on grant revenue is permitted.
Reporting	Use reports to support the grant budget maintenance process including, but not limited to, reports that allow you to do the following: • Get a budget overview • Compare budget versions • Get an overview of revenues increasing the budget

4.5.3.1.2.3 Grants Billing and Receivables

Business Background

Maintaining sponsor billing methods and ensuring proper accounting and timely reimbursement.

Receiving funding is a major milestone for many institutions with many requirements. To meet these requirements, institutions must document and automate many processes, including billing and receivables.

Key Features

The following table explains the key features available:

Key Feature	Use
Manual billing	Manual request of payback to the grantee organization.
Resource Related Billing	Bill grant expenses based on consumption. Ability to bill based on different basis of accounting: accruals vs cash.
Milestone Billing	Bill grant expenses following a specific grant or project milestone plan.
Periodic Billing	Bill grant expenses based on specific installments and periodic or non-periodic dates.
Reporting	Report on billable amounts based on status (open, partially or completely billed) for one grant, group of grants, sponsor or group of sponsors.

4.5.3.1.2.4 Closeout

Business Background

Create customized closeout rules that meet sponsor guidelines and requirements.

Customizable financial closeout rules can help grantees restrict or prevent additional postings, review and act on outstanding obligations, detail sponsor requirements for preparing financial and technical reports, maintain program and grant stages of completion, and detail the steps required for organizational reporting. The closeout process includes a final review of financial transactions and administrative tasks to ensure that proper action is taken to conclude the programs and projects according to a sponsor's requirements. This support helps ensure that the grantee properly concludes all programs and projects according to sponsor specifications.

Key Features

The following table explains the key features available:

Key Feature	Use
Run overhead or indirect cost calculation	Based on sponsor defined rules and guidelines, charge the necessary grant overhead to the sponsor by increasing the grant expense and billing it for reimbursement.
Transfer residual budgets	Transfer residual budgets among sponsored programs or classes or return unused budgets to grant.
Reporting	Report on all grants that are either about to close or closed.

4.5.3.2 Public Sector Collection and Disbursement

Business Background

Public Sector Collection and Disbursement (PSCD) is used to manage taxes, charges, and state benefits from or for business partners, citizens, students, and taxpayers. The business partners (citizen, student or taxpayer), their accounts (citizen accounts, student accounts, or tax accounts) and contract objects (objects for taxes and state benefits), including the related business transactions, are managed in Contract Accounts Receivable and Payable.

Key Features

Key Feature	Use
Mass Data Processing	You can manage open item and payment processing in a mass processing run.
Master Data Management	You can manage master data to link business partners, contract accounts and contract objects in all possible combinations.
Inbound Correspondence	You can use contract objects to control the obligation of a business partner to submit inbound correspondence. You can perform mass or single processing runs to select overdue inbound correspondence and execute a correspondence dunning run.

4.5.3.3 Tax and Revenue Management

4.5.3.3.1 Taxpayer Identification and Returns Processing

Business Background

Tax Identification and Returns Processing enables government agencies to administrate the complex and lengthy tax and revenue management life cycle including the key processes such as registration, account maintenance, tax return filing and remittance processing, billing, correspondence and contact management, audit and compliance.

Key Features

Key Feature	Use
Revenue Type Definition	You can define the revenue types that represent the agency tax type. You can configure tax return forms and business rules to validate and bill the tax return or tax object for each revenue type.
Taxpayer Registration	You can use guided procedures that facilitate the registration process, supporting a single view of the taxpayer while accommodating all revenue types, both form (self-assessed) and object-based taxes (such as vehicle or property taxes).
Tax Return and Registration Capture	You can use submission of various types of tax returns, such as amended and joint returns, through multiple channels such as paper, fax, batch upload, and the Internet.
Automatic Form-Based Tax Return Processing	You can use a rules engine to automatically validate the tax return data to satisfy the filing obligation record.
Manual Form-Based Tax Return Processing	Once the tax return has been automatically validated and exceptions have been raised you can resolve the exceptions within the tax officer work center. Once you have resolved the exceptions, the tax return is finalized and released for billing.
Tax Object Processing	You can use a rules engine to calculate the tax liability for tax objects (such as vehicles and property) based on the tax object attributes.
Invoicing	You can process the creation of invoices and the integration of billing documents in Public Sector Collections and Disbursement.

4.5.3.4 Investigative Case Management

Business Background

Investigative Case Management enables you to manage your investigation processes from start to finish, and enables you to set up and run functions and processes for cases, activities, incidents, persons and organizations, objects, locations, documents, including all their relationships.

Key Features

The following table explains the key features available:

Key Feature	Use
Case management	You can use cases to manage the entire investigation process, from creation to closure and keep all the relevant information together. The case is a container, which stores all of the following activities, related entities, and documents.
Incident management	You can use incidents to document certain events that trigger or play a role in an investigation. Incident management tracks the place, time, reporter, legal issue and so on.
Object management	You can use object management to track and relate all information about physical objects, such as stolen properties, DNA traces, official documents and so on.
Location management	You can use location management to track and relate addresses or geographical locations, such as a room, building, road junction, wood, lake and so on.
Person and organization management	Persons and organizations can be involved in cases in different roles, such as suspect, witness, or victim. Person and organization management provides a great variety of information, such as person descriptions or profiles. It also embraces those persons and organizations with a professional involvement, such as lawyers or laboratories.
Activity management	You can use activity management to manage all activities performed by employees in your organization. This includes making appointments and creating tasks. A calendar is integrated.

Key Feature	Use
Relationship management	You can use relationship management to identify interdependencies between persons, organizations, objects, or locations, to define whether any of those entities or events are part of investigative activities, leads, or cases. You can identify the context of two entities and help draw the right conclusions in an investigation.
Document management	You can use the integrated document management system for filing, versioning, and collaboration on documents, which are relevant to a case or an related entity.

4.5.3.5 Social Services Management

Business Background

The Social Services Management solution helps social services agencies to receive benefit applications from their customers, determine an applicant's eligibility and calculate the benefit entitlements. Once a benefit decision has been approved, the benefit payments are determined and processed.

Eligibility and entitlement rules can be implemented without coding, and are used to automate the decision making process, allowing the caseworker to focus on high-value tasks and improving the service offered to constituents.

Key Features

The following table explains the key features available:

Key Feature	Use
Case Management	• Get a consolidated view of cases by linking applications, case notes, decisions, communication, and payments across systems. • Synchronize operations by coordinating assignments, tasks, and rules-based workflows across stakeholders. • Improve outcomes using longitudinal analysis throughout the case lifecycle.
Benefit and Deduction Decision Processing	• Process benefit entitlements and determine planned payments. • Apply deductions automatically to recover liabilities and fulfill financial obligations. • Manage over- and underpayments for retrospective adjustments and reductions for nonparticipation.

Key Feature	Use
Payables Management and Payment Handling	• Reduce costs by automating payables management and payments from multiple sources in one system. • Manage customer accounts using flexible payment options.
Business Rules Processing	• Provide a rapid response to changing business requirements by simplifying the composition, execution, and maintenance of all-important business rules. • Implement business rules without coding. • Manage the full lifecycle of business rules.
Activity Management	• Manage staff tasks in a timely manner considering skills and integrity requirements. • Manage appointments and interactions with customers across multiple channels. • Manage in- and outbound correspondence and notifications.
Business Partner Management	• Manage the information about any kind of involved party, including personal and legal entities and groups of entities such as a family. • Manage the relationships between involved parties. • Manage in which capacities (roles) an involved party engages with your organization.
Document Management	• Attach information in any kind of file format to any object, such as the case, social application, social service plan, ... • Use pre-integrated document management capabilities or integrate an external document management system.

4.5.3.6 Multichannel Foundation for Public Sector

Business Background

`SAP Multichannel Foundation for Public Sector` is a constituent-facing solution that enables public sector organizations to interact with their constituents using a set of standardized and reusable OData services.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage Online Accounts	You can access a constituent account, change the password, and reset a forgotten password.
Manage Constituent Details	You can: • View and update personal, address and contact information, and communication preferences. • Display, add and delete business partner relationships. • Display contract object and fact details.
Process Forms	You can: • Display filing obligations. • Display, update and submit forms. • Verify and auto-populate forms content using a business rule engine. • Add, delete and display attachment. • Submit forms without user registration.
Access Billing Information	You can view the account summary, bills and details of a particular bill.
Manage Payments	You can: • Manage bank account details. • Manage credit card details. • View and update the payment and refund account assignment. • Make a one-time payment. • View the payment history. • Cancel a scheduled payment. • Manage auto-payments. • Create or cancel a payment on account. • Execute credit card payments without user registration.
Display Communication	You can: • View alerts and correspondences. • Display or search the business directory.
External User Management	You can: • Create or change users and privileges. • Receive user ID and password notifications.

4.5.3.7 Country/Region-Specific Features in Public Sector

Key Features

The following table explains the key features available for the countries/regions:

Country/Region	Key Feature	Use
Czech Republic	Public Sector Reporting	You can prepare the necessary public sector reports and submit them to the responsible authorities on a regular basis.
France	Interest Calculation	You can calculate interest on arrears during payment processing. This function enables public sector organizations in France to record, manage, monitor and report data related to all stages involved in handling interest on arrears, including receipt of invoice, invoice validation by budget responsibles and accountants, invoice payments, and delays in processing.
Hungary	Public Sector Reporting	You can prepare the necessary public sector reports and submit them to the responsible authorities on a regular basis.
Kuwait	Budgeting	During the budget preparation process, you can analyze expenditure. You can also review the budget data for an entire FM area, or for specific activities and departments within that area.
	Earmarked Document	You can extract the funds reservation information (reservation order) and the funds commitment information (agreement order) with appropriate header and item information.
Norway	Electronic Invoicing	You can process electronic invoices. Electronic invoice agreement refers to the agreement between bank and the customer containing details on the use of eInvoicing service.
	Payment Medium Format	You can use payment medium formats for creating payment files with your incoming and ountgoing payment details.
Qatar	Budgeting	You can process budget preparation and execution, including expenditure analysis and commitment items.
	Earmarked Document	You can extract the funds reservation information (reservation order) and funds commitment information (agreement order) with header and item information and print them.
	Obligation Order	You can extract FM document information (obligation order) with header and item information and print them.

Country/Region	Key Feature	Use
Saudi Arabia	Budgeting	You can process budget preparation including commitment items, and you can validate budget transfers.
	Earmarked Document	You can extract the funds reservation information (reservation order) and funds commitment information (agreement order) with header and item information and print them.
Slovakia	Public Sector Reporting	You can prepare the necessary public sector reports and submit them to the responsible authorities on a regular basis.
Spain	Earmarked Document	You can validate each grouped value adjustment document item as well as on the whole document in a single operation. Each grouped value adjustments document links to legal official budget modification operations and these legal documents may be attached (as a scanned document) to the grouped value adjustment document.
	Withholding Tax	You can process revenue posting from withholding tax.
	Payments	You can process the following: • Combined Acceptance Request Posting and Clearing (CARPC): you can use this process when a customer makes a payment, but there is no open item on the customer account. • Recovery: you can use recovery when a payment request and a payment to a vendor are incorrect and the vendor therefore returns a certain amount of the payment. • Payment Release List: you can process, approve, and release items for payment.
	Invoicing	You can post vendor or customer invoices that contain deductible amounts into two reconciliation accounts (invoice splitting).
	Integration with Logistic Documents	You can: • Create a purchase order (PO) or a purchase requisition (PR) with reference to the earmarked funds document (EFD) categories funds reservation (FR), funds commitment (FC) or funds pre-commitment (FPC). • Allow budget control to be made by the EFD or by the posting of the invoice verification, in place of the PR or the PO. • Use invoice verification to take over the budget from the PO. • Define combined documents for invoice verification in the budgeting ledger. • Allow the year of cash effectivity (YCE) to be part of the budgetary account assignment in the PR, PO, and invoice verification processes.

Country/Region	Key Feature	Use
United Arab Emirates	Budgeting	You can process the following functions: • To ensure that budget requests are approved by the relevant departments, you can set up a workflow for the budget approval process. • The approved budget from the previous year must be taken into account during the budget preparation process. • You can enter budget for more than one budget category at the same time. • You can process budget transfers. • You can process budget reporting.

4.6 Services

4.6.1 Professional Services

4.6.1.1 Projects and Engagement

Business Background

Commercial Project Inception synchronizes the creation of sales documents (quotation, contract, or sales order) and projects between Sales and Distribution and Project System, and provides visibility and control of the customer engagement process.

Features

Key Feature	Use
Commercial project inception	You can create projects with the creation of sales documents (quotation, contract, or sales order). When you create a sales document, this feature enables you to also create a project using standard WBS elements. If you copy a sales document with items, using the Commercial Project Inception feature, you can decide whether to create a new project or use the project already assigned to the source item.

4.6.1.2 Resource Management

Business Background

A range of tools and reports are available to establish links between employees and business objects, and thereby adjust processes and workflows to suit the size of your company and the spectrum of your services.

Features

Key Feature	Use
Lean staffing	You can use tools to manage assignments of employees to both client-facing and internal engagements. You can: • Easily identify the right professionals for your engagements • Assign selected employees to engagements and apply rules • Monitor employee assignments • Simplify and validate time recordings for employees (CATS) • Obtain reliable reports and forecasts about employee utilization • Use integrated functions for service-specific billing and financials
Enhanced time recording	You can: • View data for staff assignments from Lean Staffing • Use data from Lean Staffing assignments to perform automatic input checks during time recording in CATS • Integrate up to 10 service attributes to enhance the data record structure in Lean Staffing
Forecasting of employees to projects	Employees can plan their time, thereby documenting their availability in parallel. This improves the assessment of your employee commitments, raises visibility of employee utilization and increases the reliability of the business forecast.

4.6.1.3 Service Management

Business Background

Service attributes enable you to integrate attributes and information across the service delivery process, namely staff assignment, forecasting, time recording, controlling, billing, and debit memo request.

Features

Key Feature	Use
Service attributes	You can use additional parameters that allow flexible definition and capture of diverse requirements for service providers. These parameters are then available throughout the commercial service process, and can be used selectively in individual process steps, especially to control processes in resource-related billing.
Work periods in resource-related billing	Besides the availability of service attributes, you can also use work periods to add enhanced capabilities for billing services. In resource-related billing, the system consolidates work and cost assigned to a project (Project System) and considers these values for invoice creation.
Power lists	You can use power lists to combine lean staffing with specific processes (such as staff assignments or the order to bill process) or to invoke actions based on the information you choose to display. You can use power lists for: • Staffing assignments • Sales documents • Debit memo requests

5 SAP S/4HANA Compatibility Packs

Please note that the specific usage rights for SAP S/4HANA Compatibility Packs are set forth in the Software Use Rights Document.

Localization

In addition to the compatibility packs listed in this document, SAP provides the following functional localizations for the following countries:

Country	Functional Localization
Argentina	Electronic invoicing
Austria	Electronic invoicing
Brazil	TAXBRJ tax calculation schema
China	Electronic invoicing
Croatia	Electronic invoicing
Denmark	Electronic invoicing
Finland	Electronic invoicing
Kazakhstan	Electronic invoicing
Mexico	Electronic invoicing
Portugal	Electronic invoicing and delivery documents
Russia	Electronic invoicing
South Korea	Electronic invoicing
Turkey	Electronic invoicing
Ukraine	Electronic invoicing

5.1 Asset Management

5.1.1 Maintenance Management

5.1.1.1 Analytics for Maintenance Management

Business Background

The *Plant Maintenance Information System* is part of the *Logistics Information System* that you can use to analyze maintenance data.

Key Features

The following standard analyses are available in the *Plant Maintenance Information System*:

Key Feature	Use
Location- and Planning Group Analysis	Two standard analyses are provided to evaluate the location data and the planning group data. The information structure `S061` (*Location and Planning*) provides the data for both analyses. For the location, you can, for example, analyze the number of unplanned, planned, entered or completed orders, the overall estimated costs, the total planned costs and the total actual costs or the internal and external material rate. For the planning group, you can, for example, analyze the number of entered breakdowns, notifications or orders, or the actual total revenues and costs.
Object Class- and Manufacturer Analysis	Two standard analyses are provided to evaluate the object class data and the manufacturer data. You can, for example, evaluate the number of entered and completed notifications or orders, or get key figures about the internal and external material rate and material costs. The information structure `S062` (*Object Class and Manufacturer*) provides the data for both analyses.
Single Object-Damage Analysis	In the standard analysis for single object-damage, you can evaluate the damage data for single objects. You can, for example, evaluate the amount of damage, how many individual causes of damage there are and the number of activities performed. The information structure `S063` (*Damage Analysis*) provides the data for this analysis.
Object Statistics	You can use the standard analysis for object statistics to view statistical data for the technical object. You can, for example, view the acquisition value, get key figures about the total number of functional locations and pieces of equipment and evaluate the number of functional locations with no equipment installed. The information structure `S065` (*Object Statistics*) provides the data for this analysis.

Key Feature	Use
Breakdown Analysis	In the standard breakdown analysis, you can evaluate data recorded in connection with the breakdown of a machine. The aim of this analysis is to find out the cause behind a short or long breakdown period, or the period between two consecutive breakdowns. The information structure `S070` (*Breakdown Statistics*) provides the data for this analysis.
Vehicle Consumption Analysis	The standard vehicle consumption analysis enables you to evaluate the key figures *Distance Covered*, *Operating Hours*, *Fuel Mass* and *Fuel Volume*. The information structure `S114` (*Vehicle Consumption Analysis*) provides the data for this analysis.
Costs Analysis	You can use the standard costs analysis to evaluate the key figures regarding the costs incurred. You can, for example, analyze the total planned and actual costs for maintenance measures, the actual revenues, and the actual costs for company's own and external material for maintenance measures. The information structure `S115` (*Costs Analysis*) provides the data for this analysis.

5.2 Finance

5.2.1 Accounting and Financial Close

5.2.1.1 From FI-AA: Derived Depreciation Areas

Business Background

A derived depreciation area is an area for which the values are calculated from two or more real depreciation areas using a calculation formula.

The rules for positive/negative net book value of a derived depreciation area are checked with each posting and depreciation change in the corresponding real depreciation areas.

Technical Information

Type of Component	Component
Application Component	Derived Depreciation Areas (FI-AA-AA-BV-DD)
Software Component	S4CORE

5.2.1.2 From FI-AA: Group Assets

Business Background

You can group together several fixed assets into a group asset in order to handle these assets depreciation area-specifically for the depreciation calculation and depreciation update.

A group asset is represented in the system by a separate master record.

Technical Information

Type of Component	Component
Application Component	Group Assets (FI-AA-AA-BV-GA)
Software Component	S4CORE

5.2.1.3 Special Ledgers (FI-SL)

Business Background

You can use special ledgers to define ledgers yourself for reporting purposes.

You can manage the ledgers you define yourself with any account assignment objects as general ledgers or subledgers. Account assignment objects can be SAP dimensions from multiple applications (for example, account, business area, profit center) and own dimensions (for example, region).

The following functions (amongst others) are available with the special ledgers:

- Flexible database structures with additional fields
- Selective data retrieval
- Adjustment postings (for example, for the currency valuation)
- Alternative chart of accounts
- Alternative fiscal year with multiple fiscal year variants
- Total line items from other applications
- SAP-wide reporting (with data from different SAP applications)

Technical Information

Type of Component	Component
Application Component	Special Ledgers (FI-SL)
Software Component	S4CORE

5.2.1.4 Cost of Sales Ledger

Business Background

The cost of sales ledger (table GLFUNCT) contains the totals records for cost of sales accounting, which is a type of profit and loss statement that matches sales revenues to the costs of the products sold.

The contents of the cost of sales ledger and all special ledgers created in table GLCUNCT are included in the Universal Journal (table ACDOCA).

Technical Information

Type of Component	Component
Application Component	FI-SL-SL
Software Component	QRT_STAG

5.2.1.5 Reconciliation Ledger

Business Background

The reconciliation ledger tracks postings entered in Controlling for which the value flows affect other organizational units in Financial Accounting. This includes postings such as:

- Activity allocations
- Repostings
- Settlement of internal orders

Special reports let you investigate these postings across functional areas, company codes, or business areas.

With the new architecture, the contents of the reconciliation ledger (table COFIT) and all special ledgers created in table COFIT are included in the Universal Journal (table ACDOCA).

Technical Information

Type of Component	Component
Application Component	CO-OM-CEL
Software Component	S4CORE

5.2.1.6 SAP Financial Closing Cockpit

Business Background

The *SAP Financial Closing Cockpit* helps you with the planning, execution, and analysis of closing operations for the organizational units of your corporate group.

The solution provides a structured user interface for recurring periodical tasks in the closing process in which several people responsible are involved.

The following types of closing steps are supported: Transactions, direct execution of programs, execution of programs in batch processing, workflows and manual steps.

To optimize the closing process, the solution provides the following functions:

- event-controlled organization of closing activities
- Process overview and monitoring options
- Analysis tools

Technical Information

Type of Component	Component
Application Component	Financial Closing cockpit Add-on (CA-GTF-FCC)
Software Component	FCCO

5.2.1.7 Preparations for Consolidation

Business Background

With the preparation for consolidation you prepare financial reporting data in such a way that it can be processed from the consolidation application (for example consolidation (EC-CS)).

These preparations are prerequisite for the automatic transfer of data from the SAP Financial Accounting (FI) applications, Profit Center Accounting (EC-PCA), Materials Management (MM) and Sales and Distribution (SD) to consolidation. These applications that feed the consolidation manage the required account assignments in your documents and make these available to the consolidation with the data transfer.

The preparation for consolidation includes functions that can be used independently of SAP Consolidation to reconcile receivables/payables or expenses/revenue between consolidation units and to transfer data to the consolidation application of the parent company.

> **i** Note
>
> The data of the preparation for consolidation is stored in table GLT3 . Note that you may need table GLT3 when implementing SAP S/4HANA for the migration of general ledger accounting data.

Technical Information

Type of Component	Component
Application Component	Feeder components for consolidation: FI, EC-PCA for example
Software Component	S4CORE

5.2.1.8 Profit Center Accounting (EC-PCA)

Business Background

Profit Center Accounting supports you in determining internal operating income for profit centers according to period accounting or cost of sales accounting. It is also possible to display restricted assets on the profit centers.

Finally so-called statistical key figures (for example, employees, square meters) can be managed on the profit centers. This makes it possible to determine all the key figures normally used in Controlling (return on investment, cash flow, sales per employee, etc.).

Technical Information

Type of Component	Component
Application Component	Profit Center Accounting (EC-PCA)

Type of Component	Component
Software Component	S4CORE

5.2.1.9 Consolidation (EC-CS)

Business Background

The features of Consolidation (EC-CS) can be used for external as well as internal group reporting. Different types of consolidation are available on the basis of custom-defined organizational units (for example, companies or profit centers).

Consolidation enables you to periodically schedule, generate and monitor your consolidated financial statements. This process offers a high degree of flexibility with regard to the timing of closings as well as the configuration of different accounting principles.

Technical Information

Type of Component	Component
Application Component	Consolidation (EC-CS)
Software Component	S4CORE

5.2.1.10 Report Writer and Report Painter: Usage in Finance

Business Background

Report Writer and Report Painter are tools for creating reports that fulfil reporting requirements in Finance.

You can use Report Writer and Report Painter to report on data from multiple applications.

Report Writer uses a graphical reporting structure that is the basis for the reporting definition. During the definition the user sees the structure of the report in the form in which the report appears when the data is issued.

To make the report definition easier, you can use line models or column models and standard layouts.

In Report Writer you use functions such as sets, variables, formulas, cells and key figures to help you create complex reports that meet specific reporting requirements.

When working with Report Writer, you can use certain functions that are not supported by Report Painter. These functions include:

- Multidimensional column structures
- User-defined definition of inactive row and column combinations
- Enhanced functions for using cells in column formulas

Technical Information

Type of Component	Component
Application Component	Multiple application components in Finance, for example, FI-SL-IS, EC-PCA-IS-RP, EC-CS-IS-STD-RW, EC-CS-IS-USD-RW, CO-PC-IS
Software Component	S4CORE

5.2.1.11 DataSources: Usage in Finance

Business Background

A DataSource is an object that makes data for a business unit available to the SAP Business Warehouse (BW). DataSources contain a number of logically-related fields that are arranged in a flat structure and contain data to be transfered to BW.

DataSources are mainly shipped with the back end.

> **i** Note
>
> You can continue to use the DataSources for Finance; exceptions are listed in SAP Note 2270133. However, we recommend that you switch to the new DataSources as soon as they are available.

Technical Information

Type of Component	Component
Application Component	Multiple application components in Finance, for example AC, FI, CO, EC, TR
Software Component	S4CORE

5.2.1.12 Data Retention Tool (DART)

Business Background

The Data Retention Tool is designed to help SAP users meet legal requirements concerning data retention and data transfer for tax auditing. You use the tool to periodically extract and store tax-relevant data from various SAP applications. The data is extracted into sequential files which can be viewed with the tool in different ways.

We still support DART segments that are based on the old database tables (such as `COEP` and `FAGLFLEXT/A`) which have been replaced by the Universal Journal (table `ACDOCA`).

Technical Information

Type of Component	Component
Application Component	CA-GTF-DRT
Software Component	QRT_STAG

5.2.2 Travel Management

5.2.2.1 Travel Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Travel Management covers the end-to-end process from a travel plan, the reservation of travel services on through the creation of an expense report, its approval, settlement and posting (to financial accounting, human capital management or using data medium exchange).

Key Features

The following table explains the key features available:

Key Feature	Use
Travel Request	As a traveler, you can submit a request for an intended trip. As a manager, you can approve or reject a travel request.
Travel Planning	As a traveler, you can plan your travel itinerary by booking travel services (flights, hotels, rental cars, ...)
Travel Expenses	As a traveler, you can create and submit your expense report for reimbursement. As a manager, you can approve or reject a travel expense report.

5.2.3 Receivables Management

5.2.3.1 Electronic Bill Presentment and Payment (FI-AR, FI-AP, FI-CA)

Business Background

SAP Biller Direct allows billers to send and their customers to receive invoices electronically, thus making invoicing more efficient.

The following key features are available for bill recipients (integration with `FI-AR` and `FI-CA`)

Key Feature	Use
View bills	Bill recipients can view account balances–bills, credits, and payments.
Download bills	Bill recipients can download bills as PDF files and other formats in case an optical archive has been connected.
Pay bills	Bill recipients can pay open bills by credit card or bank transfer. They can also settle open receivables with credits.
Create payment advice notes	Bill recipients can create payment advice notes.
File complaints and make inquiries	Bill recipients can file complaints by opening a dispute case and make inquiries.

Key Feature	Use
Manage balances	Bill recipients can view monthly balances and line items. They can also carry out balance confirmation.

The following key features are available for billers (integration with `FI-AP`)

Key Feature	Use
Upload and download bills	Billers can upload bills for their recipients. They can also download the bills that they have uploaded.
View open bills	Billers can check which bills are already entered in their recipients' accounting system.
View payments already made	Billers can view the payments that their recipients have already made.
Manage balances	Billers can view monthly balances and line items. They can also carry out balance confirmation.

Technical Information

Component Type	Component
Application Component	Biller Direct (`FIN-FSCM-BD`)
Software Component	`S4CORE`

5.3 Human Resources

5.3.1 Core HR and Payroll

5.3.1.1 HR Administration

> **i** Note
>
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Business Background

HR Administration enables you to manage many benefits processes, storing information on employees by date and time. Regional HR organizations can access flexible, localized processes delivered for more than 50 countries/regions.

Key Features

The following table explains the key features available:

Key Feature	Use
Personnel Administration	You can enter and process employee-related data within your company. Personnel Administration automatically checks all data as it is entered to ensure that it is plausible. All employee-related data is logged with the exact date. Data remains transparent in your time progression at all times, and creates the basis for sound personnel decisions.
Working with Object Manager	You use the object manager to find employees whose data you want to display or edit.
Business Processes in Personnel Administration	You can perform the following business processes for an employee: • Hiring a New Employee • Organizational Reassignment of an employee • Country/Region Reassignment of an employee • Employee Leaving the company • Employee Reentry into the company
Personnel & Organization	You can use this component to manage employee master data and organizational data from a single point of access: the landing page. This intuitive user interface offers a unified and enhanced rich search, activity-based access to tasks, organizational data, employee master data, analytics, and a built-in collaboration platform.
Maintaining HR Master Data	You can use the functions for maintaining HR master data to perform all the tasks necessary to enter, update, and analyze employee data.

Key Feature	Use
Technical Processes in Personnel Administration	• You can set up general authorizations that are based on the SAP-wide authorization concept or you can set up HR-specific structural authorizations that check by organizational assignment to determine if a user is authorized to perform an activity. • The employment period calculation functions enable you to determine different employment periods from the employee data. The result of the employment period calculation is required for further processes or functions. • Within Personnel Administration, the storage functions provided by SAP ArchiveLink facilitate the use of content servers to store copies of incoming documents, such as employment contracts, appraisals, and employee photos. Thus the Human Resources department can save time and money by managing the personnel file centrally as it increases in size and detail. • You can use the archiving and delete functionality to archive or destroy long-term change documents from Personnel Administration that belong to a personnel number or an applicant number.
Service Request Side Panel	As an administrator, you can use this side panel to create and maintain service requests, directly alongside the application you are using. It enables you to provide context relevant data within the service request, which aids the Shared Service Center (SSC) agent in understanding the issue.
Management of Global Employees	This is a comprehensive solution that helps global companies streamline their expatriation and repatriation processes from A to Z according to their specific needs - from the planning and the preparation of the global assignment, to the global assignment itself and the repatriation – and thus track global employees throughout the world at any time. The recruitment process, however, is not within the scope of this functionality.
Concurrent Employment	You use this component to manage HR master data, the time data, and benefits of your concurrently employed employees, and to run the payroll for these employees.

5.3.1.2 Payroll

> **i** Note
>
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Business Background

Payroll allows you to process and ensure accurate, on-time payrolls across the enterprise. You can use this solution to process payrolls, third-party payments, tax reporting, and accounting data by country, region, and language. With its integrated functions, the solution manages differentiated value that supports net payroll calculation and legal reporting. Using this solution, users can enter HR information that becomes immediately available to payroll programs for gross-to-net calculations.

Key Features

The following table explains the key features available:

Key Feature	Use
Gross Payroll	You use this feature to determine an employee's basic remuneration as well as any special payments, overtime payments or bonuses that must be effected for the period in question.
Net Payroll	You use this feature to determine employee's net remuneration, according to contractual requirements. Net pay is the amount paid after the deduction of net and social insurance contributions from gross remuneration.
Off-Cycle Payroll	As an addition to regular payroll, which carries out payroll at fixed regular intervals, this feature enables you to carry out specific off-cycle payroll activities for individual employees on any day.
Loans	You use this feature to enter, administer and perform payroll for company loans in the SAP system.
Bank Transfer	You use this feature after the payroll run, to generate data medium exchange (DME) files for your bank. Based on these files, the bank can process the wage and salary payments.
Posting to Accounting	You use this feature to evaluate the payroll results for posting to accounting. This feature is the interface between Payroll and Accounting.
Reporting	You use this feature to generate various reports to be used internally or to be sent to legal authorities. Some examples of reports are the Remuneration Statement, Payroll Journal, and Payroll Account.
Payroll Control Center	You use this feature to control the complete payroll process. It helps you to plan, monitor and audit your process, producing high quality results quicker and more efficiently.

5.3.1.3 Organizational Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

As an HR professional or manager, you can gain a full view of your organizational structure - and capabilities of talent management processes. Assigning requirements to developed job positions provides input for choosing the most fitting, talented employees.

Key Features

The following table explains the key features available:

Key Feature	Use
Manager's Desktop	This component provides managers with data on the organizational plan of their area of responsibility and enables them to edit this information.
Editing Jobs, tasks, and staff assignments	You can create, display or assign jobs, tasks, or staff assignments.
Authorizations for Human Resources	You can set up general authorizations that are based on the SAP-wide authorization concept or you can set up HR-specific structural authorizations that check by organizational assignment if a user is authorized to perform an activity. Note: All information refers to the SAP Standard Release 4.70 unless otherwise stated.
Workforce Viewer	The Workforce Viewer provides a simplified solution for representing organizational (org.) structures. The main objective is to use and display the solution within the Human Capital Management (HCM) lanes for applications such as Manager Self-Service (MSS), Personnel & Organization, and Employee Self-Service (ESS). The solution has been conceptualized to provide an easy-to-use and aesthetically pleasing graphical representation of different org. structures. Currently, the solution displays three different object types, organizational units (OrgUnit card), positions (position card), and employees (employee card).
Position Budgeting and Control	You can use this component to finance employees efficiently in accordance with budget or legal requirements.

Key Feature	Use
HR Funds and Position Management	Gives you a detailed view of your overall personnel budget, and links this budget to the staff and positions in your organization.
Personnel Cost Planning and Simulation	This component enables you to execute operational personnel cost planning. You plan the development of your employees' wages and salaries and employee benefit costs, for example, employer contributions to social insurance and further education and training costs. You can simulate different planning scenarios that are based on various assumptions and analyze the effects they have on the company. Personnel Cost Planning and Simulation enables you to support strategic personnel management and the overall strategy of your company.

5.3.1.4 Compensation Management

> **i** Note
>
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Business Background

Compensation management enables you to differentiate between your remuneration strategies and those of your competitors while still allowing flexibility, control, and cost effectiveness. It provides a toolset for strategic remuneration planning that reflects your organization culture and pay strategies, and it empowers line managers within a framework of flexible budget control. Compensation Management allows you to control bottom-line expenditures and offer competitive and motivating remuneration, be it fixed pay, variable pay, stock options, merit increases, or promotion – in other words, total compensation.

Key Features

The following table explains the key features available:

Key Feature	Use
Compensation Administration	You can use this component to plan and process remuneration changes.

Key Feature	Use
Long-Term Incentives	You can use this component to set up your company's long-term incentive (LTI) plans and describe how equity compensation should be granted and handled.
Budgeting	You can use this component to create, change, and monitor budgets in your company.
Job Pricing	You can use this component to analyze, evaluate, and determine the compensation level for specific jobs, based on the current market rate. This component enables you to offer competitive compensation packages that attract the best possible pool of applicants, thus enabling you to hire the best possible employees for your organization.

5.3.1.5 Manager Self-Service

> **i** Note
>
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Business Background

Manager Self-Service enables you to increase productivity and reduce operational burdens for HR staff. A role-based user interface that helps managers make decisions on executing human capital, financial, and operational management strategies. This solution supports planning, analysis, budgeting, recruitment, compensation, employee development, and cost management processes on any device. Access to automated processes, data, and workflow requests can reduce cycle times and transactional costs. It integrates self-services with business intelligence capabilities and aggregates data from all sources. Managers can use this integrated data to make informed decisions regarding corporate strategies and resource management.

Key Features

The following table explains the key features available:

Key Feature	Use
Manager Self-Service: Home page	You can view: • Team • Birthdays and Anniversaries • Time Recording Status for My Team • Deadline Monitor • Competency Matchup • Substitution
Manager Self-Service: Work Overview Page	You can use this application to access your inbox. The inbox lists the work items, alerts, and notifications for which you are responsible.
Team	• You can have an overview of the team attendance and also view the team calendar. • You can display employees for one or more organizational units, display directly reporting employees in a list, search for employees. • You can start a process for one or more employees. • You can start the hiring process for a new employee. • You can display forms and attachments. • You can select one or more direct reports to manage their participation bookings.
Recruiting	• You can obtain a comprehensive overview of all requisitions that you have initiated with your own requisition request that you are processing as a substitute for another manager, or that were assigned to you by a recruiter. • You can call and edit questionnaires for candidates. • You can assess candidates with regard to the Talent Pool or requisition. • You can display a data overview of requisitions, requisition requests, candidates, and job postings. • You can create or edit a requisition request. • You can specify substitutes who can take over their tasks during planned or unplanned absences under the recruitment process.

Key Feature	Use
Talent Management	• You can display the pie-chart and competencies matchup information. • You can execute a flexible or predefined appraisal process. • You can plan or approve compensation for managers or employees assigned to you. • You can display an overview of the current status of the planning process in Compensation. • You can display detailed information about an employee's compensation. • You can compare compensation of multiple employees. • You can display an employee's detailed employee compensation profile.
Planning	You can: • Display service requests submitted requesting master data changes and budget updates • Manage planning rounds as part of Express Planning
Projects	You can: • Display service requests submitted requesting master data changes and budget updates • Display planned costs and cost consumption on orders for which you are responsible • Display planned costs and cost consumption for projects based on the work breakdown structure (WBS) elements • Display the budget and funds available on orders for which you are responsible • Display the budget and funds available for projects based on the work breakdown structure (WBS) elements
Budget	You can display: • Critical variances by profit Centers, Cost centers, or orders • Critical postings by profit Centers, Cost centers, or orders • Costs and depreciation associated with each asset and piece of equipment • Assets and pieces of equipment that are assigned to each employee
Organization	You can: • Displays the Organization Units in the manager's area of responsibility • Select and launch position profile • Request an administrative change for a job, position, or organizational unit • Search for organizational processes • Change the position requirements for your positions
Reports	You can use this service to launch reports that are relevant for you.

Key Feature	Use
Substitution	You can substitute both tasks and applications to other users in an organization.
Reminder of Dates	You can use this service to see the birthday, anniversaries, and dates from the monitoring of task absence data for the employees who are in your area of responsibility.
Employee Self-Service on Behalf in MSS (WDA)	You can launch services (applications) on behalf of your employees

5.3.1.6 Employee Self-Service

> **i** Note
>
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Business Background

Employee Self-Service enables you to improve productivity by automating processes and reducing administrative costs, cycle time, and error rates. By giving employees more control over their own data, organizations can realize a quicker return on investment. Self-services gives employees personalized access to their own HR data, processes, and services. Employees take more responsibility for their jobs and career development. Employees can enter, display, and update personal information such as bank information and emergency contacts. HR staff members freed from routine inquiries and data entry can focus on strategic initiatives that contribute to business goals.

Key Features

The following table explains the key features available:

Key Feature	Use
Employee Self-Service (ESS) in Training and Event Management	You can: • Display the current business event offering. • View all of their bookings and the status of each booking. • Provide support for the organization and management of business events by giving internal Intranet users access to an event calendar divided into subject areas. • Make bookings or prebookings for business events directly via Intranet. • Access information on bookings they have made for training courses or other business events offered by your company. • Cancel your own bookings on business events offered by your company.
Employee Self-Service (ESS) in Recruitment	You can: • Apply to vacancies advertised internally • Create attachments • Check the status of your job applications over the intranet
Employee Self-Service (ESS) in Personnel Development	You can: • Edit your qualifications profile • Compare your qualifications profile with the requirements profile of the position to which you are assigned. • View the qualifications (skills, talents, knowledge) that have been recorded in the system for you • View the requirements of the position to which you are assigned • View the appraisals where you have been the appraisee (annual reviews, for example)
ESS Services in Compensation Management	You can: • Execute salary surveys • Display a total compensation statement • Exercise awards
Employee Self-Service for Concurrent Employment	You can: • Maintain Multiple Personnel Assignments • Prevent Access to Services • Customize Global Employment Roles
ESS for Enterprise Compensation Management	You can view and print their Total Compensation Statement (TCS) whenever required.

Key Feature	Use
ESS for Personnel Time	You can record your time and absences for the projects assigned to you.
Employee Self-Service (ESS) in Training and Event Management	You can: • Display the current business event offering • View all of your bookings and the status of each booking • Access to an event calendar divided into subject areas through the intranet • Make bookings or pre-bookings for business events directly through intranet. • Access information on bookings that you have made for training courses or other business events offered by your company • Cancel your bookings for business events offered by your company
International Services	International Services are available with ESS

5.3.1.7 Benefits Enrollment and Administration

> **i** Note
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Business Background

Benefits Enrollment and Administration enables you to develop and manage employee benefit plans. As an HR staff, you can improve communication of information to and from benefits providers and review related reports. As a manager or an employee, you can access and change your benefits selections through self-service.

Key Features

The following table explains the key features available:

Key Feature	Use
Benefits Management	You can perform the following main activities using this component: • Enroll employees in benefits plans and terminate enrollments • Monitor continuing eligibility for plans • Monitor provision of evidence of insurability • View information about current benefit enrollments • Print enrollment and confirmation forms • Transfer data electronically to plan providers • Administer retirement plans
Benefits Employee Self-Service	You can use this component to manage your benefits independently online. You have continual access to up-to-date information about your benefits, and any changes you make are immediately effective.
USA Specifics	Addresses functions in the Benefits Administration component that are specific to United States employers. This component includes information on infotypes that are used to administer COBRA plans, Flexible Spending Accounts and Tax-Sheltered Annuity Plans, as well as reports that are used to monitor employee contributions made to benefits plans.
Asia Specifics	This component enables you to implement the Claims function for Asia. This function caters mainly to medical claims, but this can also be used for other claims such as cloth reimbursements. Since most of the health care is private, a medical insurance is part of the contract of employment.
UK Specifics	This new solution for the UK market enhances existing functions delivered with the International Benefits component. It provides you with a wide range of functions to implement your chosen Flexible Benefits scheme and enable your employees to enroll in benefits plans.
Pension Fund (PA-PF)	This component includes functions that • Calculate employee contributions to the pension fund • Calculate benefits (technical account management) • Create reports • Manage a pension fund

5.3.1.8 HR Shared Services

> **i** Note
>
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Business Background

HR Shared Services enables you to deliver accurate, consistent, and timely responses to employees and managers. It simplifies the workflow required to respond to HR requests. Providers can reduce costs while helping to improve employee satisfaction with services. It provides HR services through shared-services channels in an engaging, helpful manner. Organizations can optimize shared-service delivery using the consistent, predictable, and easily navigated workspace that our software provides.

Key Features

The following table explains the key features available:

Key Feature	Use
HCM Processes and Forms	You can use this component to execute HR processes in which changes are to be made to HR master data. You can use interactive forms to integrate all involved roles directly in the process.
HR Administrator	This subcomponent of HR Administrator Services contains the HR Administrator portal role that provides all tasks and functions for the HR department in the portal. The role of HR Administrator is integrated optimally in the HCM Processes and Forms framework: The system automatically forwards the processing steps of a process that are to be performed by an HR administrator to the portal role. You can also edit employee data in this role. This function is based on the maintenance of HR master data. The HR administrator can call the master data maintenance directly using the Employee Data Maintenance in the portal or through the backend system. The HR administrator can also change master data without using the HCM Processes and Forms framework.
Digital Personnel File (DPF)	You can use this component to provide central storage for all documents that affect the employees of your company. You can store documents relating to the work relationship, remuneration, life events, for example, or certificates and other legal documents. You can design the structure of the Digital Personnel File (DPF) to suit your own requirements.

Key Feature	Use
Web Dynpro ABAP UI (Alternative UI)	The HCM Processes and Forms framework previously used the Adobe interactive forms solution integrated with Web Dynpro ABAP for its user interface (UI). A new UI based on the Floor Plan Manager (FPM) framework has been created as an alternative.

5.3.2 Talent Management

5.3.2.1 Goal and Performance Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Goal and Performance Management enables you to motivate your workforce by aligning them with corporate goals. Managers can cascade goals, review employee performance, and identify each employee's development needs with standardized, consistent appraisal and performance processes. Using this solution, managers can develop employees, calibrate their overall performance, and review potential ratings in a visual grid. They can also integrate those performance ratings with compensation management to support pay for performance - enabling the HR organization to monitor, support, and control performance processes.

Key Features

The following table explains the key features available:

Key Feature	Use
Development plans	You use this component to map general and individual personnel development plans in your system. You can use these development plans to plan and manage short-term and long-term personnel development measures.

Key Feature	Use
Objective Setting and Appraisals	This component supports you when you perform user-defined appraisal processes that assure appraisals are performed in a formalized and standardized manner in a standard business context. You can depict the typical phases of an appraisal process such as planning, reviewing, and performing.
Appraisal Systems	This component provides you with the support you need for creating appraisal systems, and planning, implementing, and reporting on appraisals. An appraisal system is a self-contained process that enables you to make formal and standardized evaluations in a business context using one or more templates (appraisal models), and in as objective a manner as possible.

5.3.2.2 Talent Assessment

> **i** Note
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Business Background

Talent Assessment enables you to consolidate employee talent profiles for full assessments in a structured and objective approach. With greater ease and speed, HR professionals and business leaders can prepare, conduct, and follow-up on talent review meetings with a cross-organizational view of up-to-date talent data. As a result, business leaders can make more-informed decisions on talent pool membership, and create and manage succession plans, employee performance and potential ratings.

Key Features

The following table explains the key features available:

Key Feature	Use
Transfer of Data to Talent Management	You can use this function to transfer existing Talent Management data from other applications into Talent Management (PA-TM).
Search in Talent Management	You can search the talent pool to identify possible successors for important positions or to discuss talents in talent review meetings

Key Feature	Use
Assessment of Employees	You can use this function to assess your employees.
Talent Profile	You can store all information relevant to Talent Management for an employee.
Talent Group	You can use this function to create groups for classifying talents and thus structure the pool of talents in your enterprise in larger logical units: Assigning a talent to a particular talent group enables a systematic entry of that talent's development and thus a better overview when managing talents, for example, for Succession Planning.
Talent Review Meeting	You can use this function to prepare, hold, and follow up on meetings for discussing talents.
Side-By-Side Comparison	You can use this function to place the short profiles of two or more talents next to each other and compare them side-by-side.
Talent Development	You can use this function to edit development plans for employees and monitor their progress.

5.3.2.3 Skill Management

> **i** Note
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Business Background

Skill Management enables you to maximize employees' utility within your company. You can plan and implement specific personnel and training measures to promote the professional development of your employees. You can also ensure that staff qualification requirements are met and planned. By taking into account employees' preferences and suitability, you can increase job satisfaction. Personnel development sets out to ensure that all of the employees in all of the functional areas in your company are qualified to the required standards, and will remain so in the future. This is achieved by developing qualification potentials.

Key Features

The following table explains the key features available:

Key Feature	Use
Qualifications and Requirements	You use the Qualifications and Requirements component to define, structure, and manage your qualifications catalog. Based on this qualifications catalog, the organizational structure (and, if required, other information) you can create profiles. You can then use these profiles to manage, evaluate, and compare object characteristics. The profiles can be used to show both the requirements of a position and the qualifications and career goals (preferences) of a person. You can also run profile matchups to find out how suitable certain persons are for a certain position in your organization, for example. If any qualification deficits arise, you can plan further training measures.

5.3.2.4 Succession Management

> **i** Note
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Business Background

Succession Management enables you to develop and manage employee benefit plans. HR staff can improve communication of information to and from benefits providers and review related reports. Managers and employees can access and change their benefits selections through self-service to better serve their own needs. HR staff can maintain legal compliance at lower cost on a single record system integrated with self-services and payroll processes. Integrated processes support all HR administrative tasks and flexible reporting and analytics provide a fuller view and insight into benefits processes.

Key Features

The following table explains the key features available:

Key Feature	Use
Careers	This function enables you to create and change careers. A career is a collection of jobs or positions, and describes a generally applicable career path within the organizational structure. By defining careers, you can portray the principal personnel development paths within your company.
Career Planning	This function enables you to prepare and work your way through career planning scenarios. A career planning scenario takes an employee's personality, skills and abilities and determines the positions this employee should occupy in the course of his or her future career, and the training measures required to obtain the additional qualifications needed for this. A career planning scenario anticipates how an employee's career will develop.
Succession Planning Scenarios	This function enables you to prepare and work your way through succession planning scenarios. Succession planning sets out to ensure that there is a continuous supply of qualified personnel.
Organizational Basis of Succession Planning	You use this function to make organizational arrangements for Succession Planning.
Job Architecture for Talent Management	You can use this function to edit the job architecture for Talent Management, meaning the job catalog with functional areas, job families, jobs, and positions. In particular, the job architecture forms the basis for Succession Planning.
Automatic Limiting of the Validity for Successor Assignments and Talent Assignments	The system uses this function to automatically delimit or delete successor assignments and talent assignments for employees (see Delimit) if one of the following situations arises: • An employee previously assigned to a position as a potential successor becomes the new holder of this position. • A talent's employment status changes from Active to Left Company, Inactive, or Pensioner.

5.3.2.5 Training Environment

> **i Note**
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Business Background

SAP S/4HANA supports the integration with a training environment (currently SAP Learning Solution for SAP S/4HANA) to enable the creation, management and execution of trainings from the side of learners, and instructors.

5.3.3 Time and Attendance Management

5.3.3.1 Time Capture

> **i** Note
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Business Background

Time Capture enables you to record and manage time data effectively and efficiently. It provides you with a comprehensive and effective business concept and related processes for manual and automatic recording of personnel times. Time recording allows you to enter employee time data for working time, leave, business trips, and substitutions using different methods. This data can be entered as clock times or in hours and can contain account assignment specifications for other SAP applications.

Key Features

The following table explains the key features available:

Key Feature	Use
Maintaining and Displaying Time Data Using The Time Data Menu	You can update or display time data using the Time data menu. This option allows you to access all Time Management infotypes in the Personnel Time Management, and then display or maintain them.
Maintaining and Displaying Time Data Using Calendars	You can maintain or display data using either a weekly, monthly, or annual calendar. Using calendars facilitates the fast entry of data, and also allows you to view the data record history for a selected period.

Key Feature	Use
Fast Entry of Data	The fast entry of time management data enables you to maintain several subtype records for an employee within the same time infotype, as well as maintain one infotype for several employees. The fast entry function merely takes required entries into account. This allows you to record essential time management data more quickly and efficiently.
Cross-Application Time Sheet	You can use the Cross-Application Time Sheet for recording working times and tasks. It enables you to control all business processes concerning your employees' tasks – from paying the employees, through monitoring the progress of a project, to creating invoices.
Personnel Time Events	The Personnel Time Events component enables you to connect external time recording systems to SAP Time Management. If your employees enter the start and end of their working times on time recording terminals, you can use this component to process the resulting time events in Time Management. You can also process employee expenditure data resulting from purchases at company cafeterias and service stations.
Plant Data Collection	This component controls the transfer of confirmations to Time Management from the following application components: • Production Planning and Process Control • Plant Maintenance and Customer Service • Project System
Timesheet	You can log in time spent on different tasks (projects or non-project related) using this feature.

5.3.3.2 Time Calculation

> **i** Note
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Business Background

Time Calculation enables you to define and manage time elements for payroll schedules, and shifts. Use a time-evaluation component to generate a variety of payroll-related time codes to determine employee pay. Decision makers can use time management analytics to get other targeted workforce information. You can get this solution designed for global processes, as well as localized processes for more than 50 countries/regions, in a single platform.

Key Features

The following table explains the key features available:

Key Feature	Use
Work Schedule	You store working and break times for groups of employees in this component. This then allows to you to structure working times for your enterprise. You can define work schedules with flextime models or rotating shifts for particular organizational units. You can also set up the legislative regulations, collective agreements, and internal company policies that stipulate employee working time in your system.
Shift Planning	This application component allows you to determine and schedule the appropriate number and type of human resources required for your enterprise to carry out business requirements.
Integrating Time Management with Other Components	You can use the Integrating Time Management with Other Components to record time data that can also be used and processed by other components.
Time Manager's Workplace	It is a user interface incorporating the tasks involved in administrating employee time and labor and time evaluation messages. It was specifically designed to meet the needs of time administrators in decentralized departments.
Time Management for Concurrent Employment	If you have employees who have one or more personnel assignments with one or more employers, you can use this component to process your employees' time-management data.
Time Evaluation Without Clock Times	You can use this component to evaluate employees' personnel times. It processes time data that has been imported to the SAP system from time recording subsystems and data that has been recorded online. You can use this component to evaluate the time data of employees who enter only exceptions to the work schedule and of employees who record all times relevant to their working time (actual times). Processing in this component assumes that times are expressed as the duration of work, and not the start and end times of work times and employee absences. All recorded times are recognized as working time. Working time provisions to be checked, such as calculation of overtime, relate to employees' daily or weekly work performed.

Key Feature	Use
Time Evaluation With Clock Times	The Time Evaluation With Clock Times component is used to evaluate employees' personnel times. It processes time data that has been imported to the SAP system from time recording subsystems and data that has been recorded online. You use this component to evaluate employees' time data where all times that are relevant to the working time (actual times) are recorded. Processing in this component assumes that times are expressed as start and end times of work performed or of absences. The main function of the component is to classify the actual times by comparing them with the planned working time data stipulated in the daily work schedule (planned working time start and end, core times, break times). Working times that exceed the specified working time frame are recognized, and are generated as overtime if attendance approvals exist for the relevant employees.
Time Data Processing in Time Evaluation	You can use this function to customize the processing steps of time evaluation to suit your requirements.
Day Processing of Time Data in Time Evaluation	You can use this to evaluate time data on a daily basis.
Integration with Payroll	You can use this component to provide the Payroll component or a third-party payroll system with information on bonuses and the valuation of hourly and overtime wages. This information is required for the calculation of the gross wage.
Time Statement Form	You can use the time statement form to present the results determined by time evaluation to your employees in a clear layout. You do so by using the time statement form to create a template that is used by the system to create your employees' time statements.
Message Processing in the Time Manager's Workplace	A redesigned message processing function has been integrated into the Time Manager's Workplace. It enables time data administrators to use the same user interfaces for processing time evaluation messages as for maintaining time data.
Time Management Pool	The Time Management pool is a comprehensive instrument that can be used to check, correct, and display evaluated time data. Time data administrators can perform all their most important administrative tasks, such as processing time evaluation messages, from one central screen.
Incentive Wages	This component is implemented for performance-oriented remuneration. The following forms of remuneration are covered: • Time wages • Premium wages • Piecework wages You can implement both individual incentive wages and group incentive wages.

5.3.3.3 Absence Management

> **i** Note
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Business Background

Absence Management enables you to define and manage working calendars and vacation allowances for global and localized processes for more than 50 countries/regions in one platform. Use multiple interfaces: employee self-services, manager self-services, and mobile access. Employees can enter absences, attendance, and breaks. Managers can approve attendances and absences.

Key Features

The following table explains the key features available:

Key Feature	Use
Absences/Attendances	You can use this component to create the basic time information for the evaluation and accounting of your employees' working times. You can also record working times or absence times for individual employees.
Quotas	You can use this component to set up and administrate time accounts, which concern employees' absence entitlements and attendance and overtime approvals.

5.4 Manufacturing

5.4.1 Quality Management

5.4.1.1 Quality Improvement

Business Background

To improve your processes and products you can analyze different quality key figures.

Key Features

The following feature is available, but it is part of the SAP S/4HANA Compatibility Packs:

Key Feature	Use
Quality key figures	The quality management information system allows you to analyze quality key figures, for example, concerning quality inspections or notifications.

5.4.2 Production Planning

5.4.2.1 Sales and Operations Planning

Business Background

Sales and Operations Planning (SOP) is a flexible forecasting and planning tool with which sales, production, and other supply chain targets can be set on the basis of historical, existing, and estimated future data. Rough-cut planning can also be carried out to determine the amounts of the capacities and other resources required to meet these targets. You can use SOP to streamline and consolidate your company's sales and production operations. SOP is particularly suitable for long- and medium-term planning.

Key Features

The following features are available:

Key Feature	Use
Standard SOP	Enables you to plan at any level of aggregation, for example, high-level planning of planning hierarchies and/or product groups or detailed planning of finished products. Not only can you create sales and production plans, you can also plan other items of information such as key figures from an information structure. Moreover, you can also perform resource leveling for work center capacities, materials, production resources/tools, and costs to ensure that resources are sufficient to meet targets. You plan using an easy-to-use planning table such as a spreadsheet, in which you can define macros and events and compare actual data with planned data. Standard SOP comes largely preconfigured with the system.

Key Feature	Use
Flexible Planning	Offers multiple options for customized configuration: You can plan on any organizational level, and also define the content and the layout of the planning screens. You can process your planning data from the standpoint of almost any organizational unit (for example, sales organization, material group, production plant, product group, material) and even from the standpoint of the entire enterprise. The planning table in which you work resembles a spreadsheet. You have enormous scope to track previous planning data, anticipate market demand, run analyses, and perform what-if simulations. A series of mass processing functions automate the planning of large volumes of data.

5.4.2.2 Material Requirements Planning

Business Background

Material requirements planning enables you to ensure the availability of materials and perform basic production planning. It is typically performed by the MRP controller who monitors the material shortage situation and solves any issues on time. Another main task is to ensure that sufficient supplies have been planned to cover requirements — whether from sales orders, stock transfer orders, or from production, for example. The goal is to ensure that both customer and production demand are available on time and to avoid any disruptions due to missing parts.

Key Features

The following features are available:

Key Feature	Use
Execute classic MRP	If you have implemented BAdIs in classic MRP, you can continue to use these BAdIs in the classic MRP run in SAP S/4HANA. You can use MRP lists to check the classic MRP result. MRP lists are used to find materials with issues. These lists are snapshots of the material supply and demand situation at the time of the last classic MRP run.
Demand forecasting	You can estimate future material demand based on historic material consumption data. You can then use the material demand forecast to create planned independent requirements which are planned in the planning run and result in purchase requisitions or in planned orders. You can also use the demand forecast to compute safety stocks and reorder points.

Key Feature	Use
Forecast-based planning	You can perform forecast-based planning which is based on material consumption. As for reorder point planning, forecast-based planning operates using historical values and forecast values and future requirements are determined using the integrated forecasting program. However, in contrast to reorder point planning, these values then form the basis of the planning run. The forecast values therefore have a direct effect in MRP as forecast requirements.
Line balancing and sequencing	You can adjust the capacity of a line hierarchy to a specific model mix using line balancing. The capacity of the line hierarchy is determined by the number of takts and the number of individual capacities in the line segments. The model mix is determined by several materials, the rate of the materials and the rate routings, according to which the materials are produced. You can adjust the capacity by changing the number of takts (processing stations) and the individual capacities (people) and, if applicable, the assignment of the operations to the line segments. Here, the system automatically adjusts the rate routings in the background. You carry out a line balance if you use sequencing and if you produce several materials or material variants on a production line at one time. In sequencing, the system determines the production sequence of planned orders on the assembly lines.
Graphical planning table	You can use the graphical planning table (also known as the graphical planning board or Gantt chart) for capacity load leveling and sequence planning. You can display the data from the various evaluation lists in the capacity evaluation using the SAP presentation graphic. You can also use the SAP Gantt chart Operation/ Work Center to obtain an overview of the dates of operations at a work center. You can define the settings for the layout of data for the various graphics in the graphics profile. You specify whether the system displays the data for the standard overview as blocks, bars or lines.

5.4.3 Production Operations

5.4.3.1 Production Execution

Business Background

This chapter describes the functionality that is available within the compatibility scope for production execution for both discrete and process industries.

This capability enables you to make all the necessary preparations required for production, to coordinate the exchange of data relevant to production, and to document production progress. It is typically performed by the production operator and includes the following tasks:

- Material staging before production starts.
- Reporting goods withdrawals.

- Processing time tickets for a production order or a process order.
- Entering the goods receipt information for the order on completion of the product.
- Executing planned manual production steps.
- Documenting and logging production information.

Key Features

The following features are available:

Key Feature	Use
Electronic records	You can use electronic records to evaluate the logs that can be written for changes in database table content. These logs are stored in database table `DBTABLOG`. You can also display change documents and logs of long text changes. Electronic records are part of the SAP functionality that supports legal compliance in the regulated environment (for example, in the production of active ingredients and pharmaceuticals).
Electronic batch record	You can use the functionality of electronic batch record (EBR) if you work in a regulated environment (production of active ingredients, pharmaceuticals, and so on). The content of the EBR is stored in optical archives (using SAP ArchiveLink technology). EBR content is revisited during external audits. The content has to be available for 10 years on average.
Material identification/reconciliation (process industry)	You can use material identification to identify and verify the ingredients at the production line. You can use material reconciliation to analyze and verify ingredients at the end of a production process. It enables you to compare the material quantity that actually flowed in with the planned quantity or the quantity of the material produced. You can also display other information regarding the ingredients using the movement types. Reconciliation of the ingredients can ensure that there are no discrepancies outside of the valid range in the relationship between the input and yield. • The usage of material identification/reconciliation in conjunction with linking process control systems and other external systems is possible using Manufacturing Execution Connect (classic) and is not part of the compatibility scope (see Manufacturing Execution Connect (Classic) [page 73]). • The usage of material identification/reconciliation in conjunction with browser-based PI sheets and work instructions is part of the compatibility scope.

Key Feature	Use
Process messages	When a manufacturing order is carried out, actual process data is needed that documents the process and is available for further processing in the system and in external function modules such as process control systems. You can use this feature to send actual data from process control to predefined message destinations. Depending on the destination type, various business transactions are triggered in this way in the SAP S/4HANA system or in an external system and data is reported. • The usage of process messages in conjunction with linking process control systems or other external systems is possible using Manufacturing Execution Connect (classic) and is not part of the compatibility scope. This also applies to the maintenance of the corresponding process instruction content (characteristics-based process instructions and XStep-based process instructions). For more information, see Manufacturing Execution Connect (Classic) [page 73]. • The usage of process messages in conjunction with browser-based PI sheets and work instructions is part of the compatibility scope (control recipes/instructions, browser-based PI sheets and process messages). This also applies to the maintenance of the corresponding process instruction content (characteristics-based process instructions and XStep-based process instructions).
Control recipes (process industry) Control instructions (discrete manufacturing)	Using control recipes/instructions, you transfer control data from the manufacturing order to process control. The information contained in a control recipe/instruction and the destination to which it is sent are user-defined. • The usage of control recipes/control instructions in conjunction with linking process control systems and other external systems is possible using Manufacturing Execution Connect (classic) and is not part of the compatibility scope (see Manufacturing Execution Connect (Classic) [page 73]). This also applies to the maintenance of the corresponding process instruction content (characteristics-based process instructions and XStep-based process instructions). • The usage of control recipes/control instructions in conjunction with browser-based PI sheets and work instructions is part of the compatibility scope (control recipes/instructions, browser-based PI sheets and process messages). This also applies to the maintenance of the corresponding process instruction content (characteristics-based process instructions and XStep-based process instructions).
Process operator cockpits (process industry)	You can use this feature to link various elements of your company's process control systems as well as to monitor production execution processes. Process operator cockpits provide a single view to the operator. They can be configured for specific tasks or work groups. In one interactive screen, you can include elements such as a toolbar with shortcuts to various operations, a process instruction sheet, and a view of a process control system.

Key Feature	Use
Process instruction sheets (process industry)	You can use process instruction sheets (PI sheets) to exchange data between the partially or completely manually operated production level and the system. In manually operated production lines, this usually involves a process operator who uses the PI sheet to transfer production-relevant actual data to the system and receives data from the system. You can describe the entire production process of a product or only part of it in a PI sheet. If the PI sheet only represents part of the production process, you usually need several PI sheets to manufacture a product. You can, for example, define control and picking information for the individual production steps in the PI sheets. The PI sheet is used to inform the process operator about the individual production steps that need to be performed. The process operator can interactively maintain the PI sheet according to the phase sequence. In addition to control information, the PI sheet can contain input fields and pushbuttons. You can, for example, define fields to be filled by the process operator with the quantity of material components consumed for a phase. The material withdrawals must then be posted as goods issues in inventory management. You can use process messages to carry out this function automatically.
Work instructions (discrete manufacturing)	You can use electronic work instructions that represent the result of control instructions which are sent to your machine operator. The content is displayed as text on the screen. The instructions describe how and in which sequence a product is manufactured and can be processed on the screen. You can enter, confirm, report, or complete data interactively. Work instructions thus facilitate communication between the system and your machine operator on production lines that are operated manually (either fully or partially).
Production campaign (process industry)	You can group planned orders and process orders to produce a certain amount of a material over a certain period of time. This is done in an uninterrupted sequence on one production line. The aims of production campaigns are to: • Reduce costs achieved by grouping sequences of identical production charges and thus carrying out more efficient setup and clean-out processes which can be very costly. • Increase product quality in cases where the desired quality level is achieved gradually in the production process as opposed to immediately from the first batch. • Achieve more exact settlement resulting from clear distribution of campaign fixed costs (setup, clean-out, and tear down costs) to the orders involved.

5.4.3.2 Manufacturing Analytics

Business Background

The Shop Floor Information System is part of the Logistics Information System that you can use to analyze manufacturing data.

Key Features

The following standard analyses are available in the Shop Floor Information System:

Key Feature	Use
Work center analysis	You can use the work center standard analysis to evaluate work center data. The information structure S024 provides the data for the analysis.
Operation analysis	In the standard operation analysis you can evaluate the data from the operation. The information structure S022 provides the data for the analysis.
Material analysis	The material standard analysis allows you to evaluate the data for material. The information structure S023 provides the data for the analysis.
Production order analysis	In this analysis you can evaluate the data for production orders. The information structure S021 provides the data for the analysis.
Material usage analysis	In the material usage analysis, you can analyze data from the production orders, run schedule headers, and process orders. You can use the material usage analysis to find information on the total number of components used to produce a material, the individual components that were affected by the material usage, the planned and actual requirements quantity, for example. The information structure S026 provides the data for the analysis.
Run schedule header analysis	The run schedule header analysis enables you to evaluate the key figures from the run schedule header. The information structure S025 provides the data for the analysis.
Product costs analysis	Data from production orders, run schedule headers, and process orders can be evaluated in the product cost analysis. Both planned and actual costs for production and process orders are updated to product costs. The planned costs are updated at the exact time of release, the actual costs are updated at the point of completion confirmations and goods issues. The information structure S027 provides the data for the analysis.

Key Feature	Use
Reporting point statistics analysis	You can use this analysis to evaluate the data from repetitive planning. Here, the number of units for so-called reporting points (comparable with events in the production order) are determined and updated. The data required for the analysis is provided by the confirmed quantities and the confirmed scrap for the reporting point, which are updated in information structure S028.
Kanban analysis	The Kanban standard analysis is based on the data from the Kanban component that is updated to the information structure S029.
Exception analysis	You can display exceptions that you have defined using the *Early Warning System*. The exception analysis acts as a filter. That is, only the exceptional situations are displayed providing you with timely system support in the detection and correction of undesirable situations.

5.5 R&D / Engineering

5.5.1 Enterprise Portfolio and Project Management

5.5.1.1 Project Logistics and Financial Control

Business Background

This function provides special features that help in the logistics execution and financial aspects of a project.

Key Features

The following table explains the key features available:

Key Feature	Use
Special Maintenance using the Hierarchy Graphic	The hierarchy graphic acts as a quick and easy way to create and edit WBS elements. You can change the project hierarchy by creating or inserting WBS elements, or move these around in the hierarchy.

Key Feature	Use
Special Date Planning Functions	• In project scheduling you can schedule the project with all assigned activities, as in WBS scheduling. Additionally, you can decide whether just networks are scheduled or whether service and maintenance orders are also scheduled. • You enter dates in the work breakdown structures and individual networks. You can check and change them in all stages of a project. Scheduling determines the earliest and latest start and finish dates for carrying out activities in the network and calculates the required capacity requirements as well as the slack time or "floats". • You can change basic and forecast dates. Basic dates are the dates that have a binding character for time scheduling and for other related areas such as capacity planning. Forecast dates are dates that you expect based on a more detailed planning or on changes during the course of the project. You can enter basic and forecast dates for WBS elements and activities. In networks, you can also forecast values for the work as well as for the dates.
Production Resources and Tools	• Unlike machines and fixed assets, production resources and tools (PRTs) are movable operating resources that are required to perform an activity and can be used repeatedly. For example, PRTs include documents, engineering drawings, jigs and fixtures, and measurement instruments. • You can maintain PRTs for network activities using the Special Maintenance transactions for networks.
Workforce Planning	You use this to distribute work in internally processed activities of a project to personnel resources according to periods. The personnel resources that you can assign to activities are persons , positions , and organizational units in human resources (HR). You can carry out workforce planning with a project view or a work center view, depending on your responsibilities. In reporting you can analyze workforce planning from project, work center, and personnel resource views.
Claim Management	When you detect a variance from your project plan, you create a claim in Project System. The Project System supports Claim Management using a notification type called *claim*. You use these notifications to document variances from your project plan, name the person responsible, and initiate follow-up activities. The following are among the points you enter in the claim: • Cause of the variance • Person or group responsible • Costs arising from the variance • Actions and tasks to be initiated because of the variance The integration of unit costing with the claim and the link to workflow functions ensure efficient Claim Management execution.

Key Feature	Use
Progress Tracking	• You use this to monitor the progress of material components in PS based on events and dates. • By tracking events that have been defined in Customizing for Progress Tracking or in the progress tracking function itself, the user gains improved control over the progress of network components.
Special project reporting functions	• This allows you to execute reports for personnel cost planning. You can use this to obtain an overview of how your projects are progressing. You can compare planned and actual costs, planned and actual work, and basic start and finish dates for the projects selected. • You can combine a number of projects with similar characteristics, thereby effecting more efficient project control. This enables you to carry out analyses that allow for clearer costs at higher level, such as project manager level.
Project-specific archiving tools	You use this these tools to archive project structures. You can archive and delete operative objects in PS such as work breakdown structures and networks.
Financial planning and control for project-specific purposes	• You can agree on a transfer price for the rendering of a particular service between two WBS elements, display, and change the agreement. • You can calculate the sales price for a customer inquiry based on project planned costs and save your results in a document. You can also create a quotation, based on a sales pricing. • Easy cost planning enables you to quickly calculate planned costs for WBS elements. This is useful while carrying out project processing on cost controlling and preliminary costing for complex projects. • You can use the forecast workbench to create cost forecasts manually. You can save different versions of the forecasts and then compare the various versions.

5.5.2 Product Safety and Stewardship

5.5.2.1 Product Marketability and Chemical Compliance

5.5.2.1.1 Manage Product Compliance for Discrete Industries

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Use *Product Compliance for Discrete Industries* to manage environmental product compliance across your organization. These features support you to ensure product marketability, brand protection, and to reduce compliance costs. They enable you to manage regulatory requirements based on substance lists and to manage compliance assessments of your product portfolio. Additionally, they support compliance collaboration processes with suppliers and the ability to embed compliance controls into business processes, such as engineering, manufacturing, purchasing and sales.

Key Features

The following table explains the key features available:

Key Features	Use
Manage regulatory list revisions	You can manage substance-related regulatory list revisions based on legislation, industry standards, and customer or corporate-specific requirements. These regulatory list revisions are the basis for the compliance requirements that your products have to meet. You can prepare, create and use new regulatory list revisions, as well as updates of existing regulatory list revisions, such as EU REACH-SVHC or EU RoHS.

Key Features	Use
Manage compliance assessment processes	The system supports you with compliance assessment processes for products, components and basic materials. You can start or request the initial assessment of a product manually or automatically. You can assign and determine the relevant compliance requirements for your product. Based on your assignments, the system carries out compliance checks thus supporting you to fulfill compliance requirements relevant for your products. When finalizing a compliance assessment, documents can be generated by the system to answer customer requests or for internal use.
Embed controls into key business processes	The system supports you with compliance assessment processes for products, components and basic materials. You can start or request the initial assessment of a product manually or automatically. You can assign and determine the relevant compliance requirements for your product. Based on your assignments, the system carries out compliance checks thus supporting you to fulfill compliance requirements relevant for your products. When finalizing a compliance assessment, documents can be generated by the system to answer customer requests or for internal use.
Stay compliant within change management	If a compliance relevant change occurs, such as a BOM change or a change in the material supplier relation, the system supports you to stay compliant by carrying out compliance checks.
Monitor and explore compliance	The system supports you to identify compliance assessments that are in process for your products. Additionally, you can explore the compliance status of your products and components.

5.5.2.1.2 Substance Volume Tracking

> **i Note**
>
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Business Background

This process helps you to track and record the quantities of regulated substances in your company that are purchased, imported, produced, sold, or exported. If a limit value specified in regulations is reached or exceeded, the system issues a warning. You can use the data for required reporting to authorities.

Key Features

The following key features are supported:

Key Features	Use
System preparation for substance volume tracking	You define materials that are relevant for substance volume tracking. You enter one or more quantity limits for sustainability data, and define the threshold that triggers a system warning.
Daily monitoring of tracked substances	You display the current totaled quantities of the tracked substances. You receive information about which substances are soon to reach a quantity limit, or, about those which have already exceeded their limit.
Integration of substance volume tracking into business processes	Substance volume tracking is integrated into and visible in other business processes, such as purchasing, manufacturing and sales.
Report definition for substance volume tracking	You define layouts for your reports for substance volume tracking. You specify how the system collects data. You define the steps that need to be carried out for releasing and sending your reports. You also define if versioning for your reports is required, so that changes can only be made within a new version.
Report creation for substance volume tracking	You can create reports for substance volume tracking in several languages by using the concept of phrases. When a monitoring period, such as a calendar year, has expired and all data is available, you can trigger report generation.
Report publishing for substance volume tracking	Once reports have been released, you can send the report to relevant authorities.

5.5.2.2 Dangerous Goods Management

> **i** Note
>
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Business Background

This process enables you to manage all data, which is needed to classify and process dangerous goods in the logistics chain according to dangerous goods regulations.

Key Features

The following key features are supported:

Key Features	Use
Dangerous goods classification	You classify products and materials according to dangerous goods regulations. The classified dangerous goods are the basis for dangerous goods processing and document generation in the logistics chain.
Dangerous goods processing	You maintain supplementary dangerous goods relevant data; this is then provided together with classification data for document generation.
Integration of dangerous goods processing within business processes	Dangerous goods processing, for example checks, are integrated into and visible in other business processes, such as sales order and delivery. Checks are possible, for example, on modes of transport and mixed loading, as well as routing management.
Document template definition	You define layouts. You specify how the system collects data.

5.5.2.3 Safety Data Sheet and Label Management

5.5.2.3.1 Safety Data Sheet Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

This process enables you to manage all data, which is needed to create and send safety data sheets (SDS) according to chemical regulations and requirements.

Key Features

The following features are available:

Key Features	Use
Preparation of safety data sheet creation in different languages	You need to provide safety data sheets in several languages according to regulatory requirements. By using the concept of phrases, you are able to manage data efficiently for different languages. You can define a single layout for safety data sheets that includes country/region-specific data. Safety data sheets can be printed in multiple languages using the same set of data.
Data management for safety data sheets	Once you have managed hazardous substances and related data that fall under different regulations, the system uses this data to create all defined safety data sheets automatically. The system supports you by determining and providing as much data as possible that is relevant for safety data sheets. You can exchange data electronically within the logistics chain.

Key Features	Use
Safety data sheet definition using templates	You define layouts for safety data sheets using templates. You specify how the system collects data. You define the steps that need to be carried out for releasing and sending safety data sheets. You also define versioning for safety data sheets, so that changes to safety data sheets can only be made within a new version.
Safety data sheet publishing	Send safety data sheets: You can send these to your customers and to relevant authorities electronically. The automatic process can be integrated into the sales process. Updated versions of safety data sheets can be distributed automatically. Display safety data sheets: You can view safety data sheets that provide information required in different business processes.

5.5.2.3.2 Global Label Management

> **i** Note
>
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Business Background

You use Global Label Management during the planning, creation and printing phases of labels. It is a centrally integrated scenario-based solution to manage all labeling requirements worldwide.

Key Features

The following features support you with this process:

Key Features	Use
Label creation in different languages	You need to provide your customers with labels in several languages according to regulatory or customer-specific requirements. By using the concept of phrases, you are able to manage data efficiently for different languages. Together with material details, you can manage relevant label data, such as the packaging hierarchy.
Label definition using templates	You use templates to define layouts for labels of different sizes using the same set of data. Several languages can be printed on the same label. You specify how the system collects data. You define the steps that need to be carried out for releasing your labels. You also define if versioning for your labels is required, so that changes can only be made within a new version.
Integration into business processes	Global label management is integrated into several business processes, such as make-to-stock, make-to-order, shipment, and receipt of purchase order.
Label preview, validation and printing	You can use the label check to simulate label output before printing. Automatic printing can be determined as part of logistics processes, such as process order or delivery in sales. In addition to automatic label printing, you can also print labels manually.
Data and activity log	Changes to label data, user and printing activities are logged in the system.

5.5.3 Product Development for Discrete Industries

5.5.3.1 Engineering Record

Business Background

The engineering change process is an important process in product development. It helps to initiate, administer, review, approve, and execute product changes through a controlled process.

Key Features

The following table explains the key features available:

Key Feature	Use
Engineering record handling	You can plan your engineering changes in engineering records, which help to group all kinds of objects to then guide them through a controlled engineering change process.

5.6 Sales

5.6.1 SD Analytics Based on Logistics Information System

Business Background

You can use Sales and Distribution (SD) analytics based on the logistics information system to analyze sales information.

Key Features

The following table explains the key features available:

Key Feature	Use
Customer analysis	You can access data directly from the customer statistics. Direct access by customer is possible and is not dependent on the sales organization.
Material analysis	You can access specific statistical data that is directly linked to a material. You can use this analysis to determine the quantity of a material sold.
Sales organization analysis	You can view data from the perspective of the sales organization.
Shipping point analysis	The shipping point analysis is based on data that has been updated from the creation of the delivery note. You can determine who delivers, in what way (for example, by freight forwarding), and the route.
Sales employee analysis	You can determine the sales volume that a sales employee has achieved for a specific customer.

Key Feature	Use
Sales office analysis	You can determine the sales volume that a sales group has achieved in a division.
Variant configuration analysis	You can evaluate data for configurable materials.
Exception analysis analysis	You can display exceptions that you have defined using the early warning system.

Technical Information

Type of Component	Component
Application Component	LO-LIS
Software Component	S4CORE

Related Information

Sales Monitoring and Analytics [page 124]

5.6.2 SD Rebate Processing

Business Background

You can use Sales and Distribution (SD) rebate processing to grant a price discount to your customer.

Key Features

The following table explains the key features available:

Key Feature	Use
Work with rebate agreements created in SAP ERP	You can work with previously existing rebate agreements that you have created in SAP ERP. You can only process these existing rebate agreements until the end of the validity date of the rebate agreement. Afterwards, you must close these rebate agreements by final settlement. You cannot create new rebate agreements using SD rebate processing in SAP S/4HANA.
Creating rebate agreements using customer trade promotion in SAP CRM	If you have integrated your customer trade promotion scenario in SAP CRM with SAP S/4HANA, you can use SD rebate processing. That is, you can continue to create rebate agreements through the customer trade promotion functionality in SAP CRM.

Technical Information

Type of Component	Component
Application Component	`SD-BIL-RB`
Software Component	`S4CORE`

Related Information

Settlement Management [page 43]

5.7 Service

5.7.1 Service Master Data Management

5.7.1.1 Technical Assets, Structures, History

Business Background

Technical assets and their substructures serve as a reference on which a service is performed. At the time of initiating a service, the predefined technical master record can be referenced. This substantially shortens planning and preparation time when a service is required. This thereby reduces costs.

Key Features

The following table explains the key features available:

Key Feature	Use
Maintain Customer Installed Base	You can provide precise information and management on installed customer assets, equipment, location and substructures of the customer installed base. You can maintain master data that is required when you carry out maintenance on a piece of equipment.
Phase-In Phase-Out Equipment	You can transfer assets from their current assignment, either to be reused by another department or company, or to be disposed of completely.
Scrap Assets	Once a piece of equipment has been phased out of service, it can be scrapped. You can remove it from the customer asset register.
Analyze Damages	You can analyze reported damages, sorted by damage codes, cause codes and activities.

5.7.1.2 Service Task Lists and Catalogs

Business Background

This process helps you to define the scope of work and effort required for inspections, services, and planned repairs. It helps you to standardize recurring work sequences and to plan these effectively with required

resources, tools and materials. Single or several tasks offered to customers are customer-facing service offerings.

Key Features

The following table explains the key features available:

Key Feature	Use
Standardize Tasks	You can define the scope of work and effort required for inspection, service, and planned repairs. You can describe a sequence of individual activities which can be used for a spot-service, or repeatedly within a company. You can reduce the service effort by using standardized work sequence changes, for example as a result of new legal regulations.
Service Catalogs and Products	You can manage service products as sellable and billable. These services are standardized and offered in service catalogs.

5.7.1.3 Service Maintenance Plan and Event Scheduling

Business Background

This process helps you to specify the service scope and maintenance cycles for triggering service events. Depending on the scope of services and calculated scheduled calls, expected costs can be calculated for a specific time period.

Key Features

The following table explains the key feature available:

Key Feature	Use
Preventive and Predictive Activities	You can plan preventive and predictive activities, based on time and counter. You can schedule individual service tasks and allocate required resources, tools and materials.

5.7.2 Service Management

5.7.2.1 Service Initiation

Business Background

This process helps you to register a customer request for service. the logging service requests serves as a central communication channel between the requestor and the service provider.

Key Features

The following table explains the key feature available:

Key Feature	Use
Manage Incoming Service and Support Requests	You can manage incoming service and support requests. You can identify customers with their installed base and identify customer service contracts and warranty entitlements. You can use a centralized system to log and streamline processes, including the monitoring and follow-up of customer needs and requests. The initial service request serves as a central customer reference for further updates, inquiries and progress of service fulfillment and delivery.

5.7.2.2 Service Planning and Scheduling

Business Background

This process helps you to carry out the initial screening and collecting of information for incoming service requests. This includes relevant service contracts and warranty entitlements.

Key Features

The following table explains the key features available:

Key Feature	Use
Identify Service Issues	You can use incoming service requests to identify service issues that need to be resolved. The following help you in planning and scheduling processes: • Customer Asset Management: You can propose data from customer asset management , such as work centers, and access information regarding their skills and competencies. • Work Order Management: You can process notifications, plan resources, integrate catalogs and materials, and initiate the update technical documents and drawings.
Define Follow-Up Activities	You define follow-up activities with a variety of options, such as • A simple answer to a support request • The delivery of a service where labor and service parts are required • Logistic activities, such as managing returns

5.7.2.3 Service Execution and Delivery

Business Background

Service organizations require access to up-to-date information about service history and equipment configuration to provide the appropriate service. This process helps you to optimize, streamline and carry out your service deliveries.

Key Features

The following table explains the key features available:

Key Feature	Use
Job Lists	These support you in processing and confirming service jobs. They provide information on jobs to be carried out, as well as crucial information, such as the urgency, start and end dates, and assigned work center. You can configure job lists so that they reflect how work is organized in your particular organization. You can record counter readings, process notifications and work orders, and the installation and dismantling of equipment.
Confirmation Lists	These contain all planned service jobs that can be confirmed. You can check planned job data. You can record the time spent carrying out the job, the required materials used, enter a user-defined text, and, if necessary, create an activity report. It sets the notification to technically completed, stores the time confirmation, and posts a goods issue for the order.

5.7.2.4 Service Control

Business Background

Services have different levels of complexity. Service personnel require a flexible way to support and control the delivery of services from a financial and logistics perspective.

Key Features

The following table explains the key features available:

Key Feature	Use
Service Request	You can create, manage, monitor and complete the entire service process using a service request.

Key Feature	Use
Service Order	You can use service orders to deliver services You can also record the internal and external resources required, the costs collected, customer billing or internal cost settlement in the service order.
Service Fulfillment Support	You can use carry out large projects, process extensive budget planning data, and schedule complex services over a lengthy time period.

5.7.2.5 Service Billing and Settlement

Business Background

Service organizations require billing data from various sources to enable accurate and timely billing of services. They also need to track service revenue.

Key Features

The following table explains the key features available:

Key Feature	Use
Debit Memo Processing	You use this feature to apply a debit to a customer account, either by creating a debit memo request, or directly by creating a debit memo with reference to a billing document. A debit memo request is then created with the amount to be debited. The debit memo is sent to the customer and posted to accounting.
Credit Memo Processing	You can use this feature to apply a credit to a customer account, either by creating a credit memo request, or by creating a credit memo with reference to a billing document. The credit memo is sent to the customer and posted to accounting.

Key Feature	Use
Billing Document Processing	You can create billing documents, for example invoices for customers from items in the billing due list. When you post billing documents, the system forwards these to accounts receivable and triggers the issue of billing documents. You can change or cancel billing documents as needed. You can also create billing documents for retroactive billing. You can setup billing batch execution by scheduling billing creation and output. You can also manage documents blocked for billing.
Invoice Correction Processing	You use this feature to create an invoice correction request if the wrong quantities or prices have been calculated for the customer. The invoice correction request can be automatically blocked by the system until it has been checked. The system calculates the difference between the amount that was originally calculated and the corrected amount for each item. The system creates a credit memo with reference to the invoice correction request. The credit memo is sent to the customer and posted to accounting.

5.7.2.6 Claims, Returns and Refund Managment

Business Background

This process helps you with the handling of all complaints and returns. It is possible to trigger logistical follow-up actions, such as inspections of returned materials, resolution of issues and claims, and refunds management.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage Complaints and Returns	You can streamline complaints and returns management to improve tracking and to help service organizations process requests faster.
Process Warranty Claims	You can process large numbers of warranty claims automatically. You can trigger logistics follow-up actions, such as an inspection of a returned material, resolution of issues, and claims refund management.
Register Warranties	You can create warranties and assign technical objects to these warranties.

5.7.3 Service Parts Management

5.7.3.1 Service Parts Warehousing

Business Background

Automatic processes for full control of warehouse operations supports companies supports companies to improve asset utilization, to increase throughput and safety, and to ensure on-time compliant and accurate order fulfillment.

Key Feature

The following table explains the key features available:

Key Feature	Use
Manage Inventory	You can manage the stock stored in your warehouse. You can evaluate and display documents and stock information.
Create Reservations	You can manage and create reservations of stock at plant level, storage location level, or batch level to ensure the availability of materials when they are required.

Key Feature	Use
Distribute Stock	You can fully automate warehouse and distribution operations. These include: inbound processing, receipt confirmation, cross-docking, outbound processing, warehouse and storage management, and physical inventory management.
Create Reports	You can create reports to evaluate and display material and accounting documents.

5.7.3.2 Service Parts Fulfillment

Business Background

Companies need to be able to monitor service parts, and keep them ready for withdrawal at a later date and for a specific purpose. This process simplifies and accelerates goods movement processes.

Key Features

The following table explains the key features available:

Key Feature	Use
Monitor Service Parts	You can monitor location and quantities of service parts.
Reserve Service Parts	You can reserve service parts that will be required for a future service delivery. The reserved service parts are taken into account within the material requirement planning process. In this way, materials can be procured in time if they are out of stock.

5.7.4 Service Agreement Management

5.7.4.1 Contract Management

Business Background

This process facilitates consistency to ensure superior support and services. Contract management helps companies create, manage and automate service contracts such as billing plans, price agreements and

conditions. This process enables you to process service deliveries with automatic checks for contractual agreements.

Key Features

The following table explains the key features available:

Key Feature	Use
Use Automatic Service Contract Processing	You can create, manage and automate processing of service contracts, such as billing plans, price agreements and conditions. You can reference service contracts in subsequent service processes.
	You can create service plans that enable contractual preventive service and maintenance strategies based on time and performance.

5.8 Sourcing and Procurement

5.8.1 Subsequent Settlement

Business Background

Suppliers may agree to immediate or retrospective reductions in the purchase price on condition that a certain quantity or value of goods is bought, that payment is effected promptly, or that promotional activities are carried out. Conditions of purchase involving retrospective supplier payments may also be defined for situations in which the supplier bears all or part of certain costs initially incurred by a customer, for example, costs of disposal of used packaging.

Subsequent settlement involves calculating and accounting for the amounts due in accordance with the conditions agreed between a customer and a supplier at the end of an agreed period.

Key Features

The following table explains the key features available:

Key Feature	Use
Processing of existing rebate agreements	Existing rebate agreements can be processed up until the end of the validity date of the agreement and can then be closed by a final settlement.

5.9 Supply Chain

5.9.1 Efficient Logistics and Order Fulfillment

5.9.1.1 Basic Shipping

Business Background

Transportation is an essential element in the logistics chain. It effects both incoming and outgoing goods. Effective transportation planning and processing ensures that shipments are dispatched without delay and arrive on schedule. Transportation costs play an essential role in the calculation of the price of a product. It is important to keep these transportation costs to a minimum so that the price of a product remains competitive. Efficient transportation planning and processing helps to keep these costs down.

The transportation functions can handle planning and execution for both inbound and outbound processes. Moreover, they enable you to control and monitor the entire transportation process from the planning stage to goods issue at the shipping point (outbound) or vendor location (inbound), through to goods receipt at the customer location or in your own plant.

Key Features

The following table explains the key features available:

Key Feature	Use
Transportation Planning and Creation of Transportation Documents	Transportation planning involves activities that must be performed before the transport leaves the shipping point. These activities include, for example, acquiring the services of a forwarding agent and specifying the route for the transport. To handle the various forms of transportation (for example, individual or collective processing), different types of transportation documents are available.

Key Feature	Use
Transportation Planning List	This list contains transportation documents for which planning activities still have to be completed and which match defined selection criteria. You can use the list as a basis for performing transportation planning activities, such as organizing a means of transport or scheduling loading activities.
Transportation Execution	You use this feature to complete the formalities involved in getting a transport ready for dispatching to the customer. Tasks in an outbound process include weighing the transports, loading, and posting goods issue. At check-in (when a truck arrives on the company's premises) information about the means of transport such as driver details, the weight of the truck, and its arrival time can be recorded. You can store this information in the transportation documents, which can be printed, for example, when the completion status is set.
Direct Store Delivery (Backend)	This feature enables you to distribute goods directly to the end customer. In this process, distribution does not take place via a retail company's distribution centers. The Direct Store Delivery (DSD) business process is based on a specific DSD tour scenario, a type of cycle. This tour scenario starts in the distribution center with order processing and the related shipment preparations, followed by physical delivery of the goods to the customer, and ends with system processing of the tour data in the distribution center. The DSD backend process is the basis for integrating a mobile solution. The mobile solution supports drivers' activities during the shipment process. Alternatively, a paper-based DSD process is also supported.
Transportation Cost Processing	This feature enables you to calculate and settle costs for transportation processes. Calculation and settlement of transportation costs is handled in a separate document and allows you to refer to parts of the transportation document for which cost calculation must be carried out.
Tendering for Service Agents	The option to offer transports directly using the Internet provides a useful addition to the planning functions in the transportation component. Planners can include forwarding agents who do not use an SAP system in the decision-making process; these forwarding agents can then use their own systems to process the data. A planner can react to the offers made by the forwarding agents and can also supervise the tendering status. The planner receives tendering statistics and can verify the service quality of a service agent.
Monitoring	To be able to plan and execute the transportation activities, worklists for transportation documents are available.

5.9.1.2 Warehouse Management

Business Background

Warehouse Management provides you support with and real-time transparency into managing and processing material movements flexibly for optimized warehouse operations.

Key Features

The following logistic features are available to support you in whatever warehouse role you may have:

Key Feature	Use
Inventory Management	You can manage material quantities in different stock categories on the following levels: • Storage bin • Storage unit • Batch • Stock status • Stock attributes You can also manage material quantities without stock on bin level using transfer orders to confirm your picking or putaway activities.
Inbound Processing	You can receive products from the following sources: • Vendors • Production • Other parts of your company • Customer returns You can create and confirm putaway transfer orders for the putaway of delivered or received materials. You can use putaway strategies to determine an appropriate storage bin.

Key Feature	Use
Outbound Processing	You can pick products and send them out of your warehouse for the following scenarios: • Send ordered product to external customers, or internal customers, such as other plants • Supply products to production • Return products to vendors • Supply products to internal consumers, for example, a cost center You can create and confirm transfer orders for picking quantities of material for deliveries or production supply. You can use removal strategies to determine an appropriate storage bin to pick from.
Mobile Execution	You can execute warehouse activities on mobile devices using radio frequency (RF) transactions.
Internal Warehouse Movements	You can create and confirm transfer orders for moving products to different areas inside the warehouse, for example, replenishment of products to picking bins. You can also execute ad-hoc internal transfer orders.
Physical Inventory	You can plan, conduct, and confirm regular counts of actual product quantities in the warehouse and compare the physical stock to the data in the system. This counting can be performed in the following ways: • Annual • Continuous • Cycle counting
Reporting	Reporting gives you information about the following attributes of your warehouse: • Open and confirmed transfer orders • Stock information • Bin information • Transfer requirements
Warehouse Control Unit Interface	The warehouse management system can connect with the following: • Automated warehouse systems, such as warehouse control units (WCU) • Fork lift control systems
Wave Management (Multiple Processing)	Multiple processing lets you to group together several transfer requirements or outbound deliveries and process them all at once. Instead of converting each individual transfer requirement or each outbound delivery into a transfer order, you can select several transfer requirements or outbound deliveries, group them together, and create the corresponding transfer orders in a single step.

5.9.1.3 Direct Store Delivery (Backend)

Business Background

Direct Store Delivery (DSD) is a business process that is used in the consumer products industry to distribute goods directly to the end customer.

The backend is the basis for integrating a mobile solution. The mobile solution supports drivers' activities during the shipment process.

Direct Store Delivery Backend (DSD backend) covers the following tasks:

- Make materials available to stores and customers quickly (for example, food, drink, flowers, newspapers)
- Directly influence end customers, as the consumer products manufacturer
- Optimize process settlement in sales and in distribution
- Optimize logistics costs using efficient visit planning

Key Features

The following features are available:

Key Feature	Use
Master Data	This feature allows to maintain specific data for the Direct Store Delivery process that remains unchanged over a considerable period of time and contains information that is required repeatedly in the same format.
Visit Control	This feature allows to use visit control to plan periodically recurring customer visits carried out by drivers (different roles) on their tours, within a logistics process. Visit control consists of a strategic part (visit plans) and an operational part (visit lists). In visit plans, you specify, among other things, which customers are to receive deliveries or visits in which sequence, and how often. You can also specify the drivers and vehicles to be used for a shipment. The system creates visit lists for set days from visit plans. You can process visit lists manually and can therefore react to sudden or unique events. During dynamic transportation planning, the system uses visit lists as the basis for creating shipments.

Key Feature	Use
Transportation Planning	This feature allows to plan and organize tours with the aim of incorporating due deliveries into shipments: • Incorporated manually into a single shipment using shipment transactions • Incorporated into a single shipment or into several shipments by the system using dynamic transportation planning
Output Control	This feature enables you to automatically group together tour data for output control.
Route Accounting	Route Accounting begins after a vehicle is loaded and ends once all tour transactions have been posted. This feature supports you to manage delivery and route sales: • Specific information and documents for each tour • Entry of outgoing and incoming control data • Entry of information and documents that drivers (with different roles) hand in after their tour to the settlement office • Settlement of documents and data entered with the data available in the system • Settlement of documents and data entered in the system You can use Route Accounting without using handhelds. Drivers enter tour activities by hand in the relevant documents. You can transfer this handwritten tour data subsequently in the settlement cockpit in the system. You use the settlement cockpit to display and correct tour data, and to enter additional data manually. Direct Store Delivery Route Accounting is an offline solution. This means that data is exchanged from a handheld to the system at the start and end of a tour. It is not possible to transfer data during a tour.

5.10 Industries

5.10.1 Consumer Industries

5.10.1.1 Retail

5.10.1.1.1 Compatibility Pack for Merchandise Management

> **i** Note
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> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

The following features are available as part of the SAP S/4HANA compatibility pack for merchandise management.

For information about the features available with SAP S/4HANA Retail for merchandise management, please see Retail for Merchandise Management [page 512].

Compatibility Features

Value-Added-Services Management

Key Feature	Use
Additionals	• Offer additionals that can be either activities or articles such as putting shirts on hangers, ironing, or labeling.

For information about value-added-services management using SAP S/4HANA Retail for merchandise management, please see Master Data Management for Merchandising [page 502] under *Value-Added-Services Management*.

Retail Price Planning and Management

Key Feature	Use
Markdown plan management	• Ensure a balance between the objectives that as little stock as possible remains at the end of a season while minimizing the loss of revenue due to price reductions. • Plan the price reductions percentages and periods by means of pricing strategies.
Bonus buy using IDocs	• Specify sales price deals that can be tied to prerequisites or requirements, such as buy two, get one free, spend at least a certain amount to get a percentage off, special sales prices when a coupon is presented, and other promotional offers.

For information about the features available with SAP S/4HANA Retail for merchandise management that support retail price planning and management, including the bonus buy feature, please see Retail Price Planning and Management [page 513].

Point of Sale

Key Feature	Use
POS outbound article data	• Transfer article related information to point-of-sale (POS) and store merchandise management solutions using the IDoc format as an alternative to using assortment lists to transfer article data.

For information about the features available with SAP S/4HANA Retail for merchandise management that support store connectivity, including the assortment list feature, please see Point of Sale [page 516].

Merchandise Buying

Key Feature	Use
Purchase order optimizing	• Analyze whether increasing order quantities will be profitable in the case of upcoming known purchase price increases by using investment buying capabilities to determine the optimum quantities to be ordered on top of regular demand, based on factors such as storage cost. • Optimize purchase order quantities to external suppliers through load building by making the best possible use of transportation methods, for example, by ordering complete truck loads.

For information about the features available with SAP S/4HANA Retail for merchandise management that support merchandise buying, please see Merchandise Buying [page 507].

Replenishment Planning and Allocation

Key Feature	Use
Rapid replenishment	• Calculate required net quantities for articles for stores on a demand basis. • Generate follow-on documents such as purchase orders or sales orders for merchandise. • Monitor and analyze the results of replenishment planning and display follow-on documents.

For information about the features available with SAP S/4HANA Retail for merchandise management that support replenishment planning and allocation, please see Replenishment Planning and Allocation [page 509].

Demand Forecasting and Planning

Key Feature	Use
Sales forecasting	The specific use cases in retail processes are: • Forecast requirements based on past figures to support requirements planning methods: • Create forecasts based on freely definable data (alternative historical data) on purchase order quantities or on aggregated sales quantities from the stores that are supplied. See also Material Requirements Planning [page 65]

For information about the features available with SAP S/4HANA Retail for merchandise management that support demand forecasting and planning, please see Demand Forecasting and Planning [page 510].

Integration Scenarios

Key Feature	Use
Integration with SAP Apparel and Footwear	• Transfer required master data to enable the SAP Apparel and Footwear solution to run integrated processes.
Integration with SAP Demand Management	• Transfer required master data to enable the SAP Demand Management solution to optimize sales prices. • Receive proposals as the basis for sales prices calculation.
POWER lists (Personal Object Work Entity Repository Lists)	• Visualize specific business objects as a starting point to launch operational transactions.
Closed-loop scenarios based on SAP Business Warehouse	• Integrate information from SAP Business Warehouse in operative processes.

5.10.2 Discrete Manufacturing

5.10.2.1 Mill Products

5.10.2.1.1 Non-Ferrous Metal Processing

Business Background

The prices of products containing raw materials such as copper, aluminium, lead and silver, which are traded on metal exchanges, can change daily. The non-ferrous metal processing function enables you to consider fluctuating metal prices in the area of pricing of Sales and Purchasing.

Key Features

Feature	Use
Pricing in Sales and Purchasing	Non-ferrous metal processing enables you to consider the current metal prices quoted on the metal exchanges in pricing. The most up-to-date rates are stored in the system. In addition, the metal content of each product is defined in the material master data. Various metal price arrangements with the business partners can be defined for each item in Sales or Purchasing.
Invoicing (SD) and Invoice Verification (MM)	Invoicing considers the latest metal quotation. Missing quotations trigger an invoice block.

5.10.3 Energy & Natural Resources

5.10.3.1 Oil & Gas

5.10.3.1.1 Remote Logistics Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Remote Logistics Management (RLM) provides functions for supplying materials from base locations to remote locations (offshore oil platforms). Goods are ordered for the offshore oil platform and are delivered from the onshore plant. If the onshore plant does not have the goods in stock, the material must be ordered from a vendor. After the goods receipt at the onshore plant, the material is packed and shipped to the offshore location. Shipping is carried out in RLM using voyages and shipments. A voyage consists of one or more shipments. The actual material is loaded into containers. Materials can be held at the onshore location, if required, and returns can be created. Returns are used to return defective goods (or goods that are not needed) from the offshore location to the onshore location. For a more detailed description of this function, see below.

Key Features

The following table explains the key features available:

Key Feature	Use
Supply Chain	The Supply Chain function is used to configure the supply of materials according to the handling required (such as whether a material is stocked onshore or offshore). Supply Chain enables you to convert stock transport requisitions activated at the offshore location into purchase requisitions at the base plant.
Goods Receipt	During goods receipt of RLM materials to be shipped offshore you can assign goods receipt items to deliveries ready for shipment, or you can accept the default assignment proposed by SAP RLM functions. Following the goods receipt of materials destined for offshore locations, RLM creates one or more deliveries ready for shipment. You receive a list of those with all other goods receipt items in a cross-docking report (presented automatically following the receipt of any RLM materials). You can access RLM packing routines from the cross-docking report so that deliveries created for a goods receipt can be packed into containers. The cross-docking report determines which deliveries have not been packed into a shipment and lists them in a packing screen.
Shipping	Shipping functions provide you with a flexible container master record. This represents the physical container used in the shipment and allows you to define shipping containers using alternative data sources, including the PM equipment master, a dedicated RLM container master, and Internet sources (such as Web pages of shipping companies). While working with a shipment you can track a specific container by referencing the flexible container master record. Additional packing routines allow you to use a simple drag-and-drop functions to pack deliveries into containers that are not yet assigned to a shipment and to transfer packed containers into a shipment once you know the loading requirements. A shipment receipt utility is provided to register the receipt of all deliveries in a shipment and to release all the containers in a shipment for use in future shipments.

Key Feature	Use
Holding	The Holding function allows materials required offshore to be held onshore until the user requesting the materials is ready to receive them. Holding is controlled within the original PM order or transport requisition and will cause any subsequent deliveries to be blocked for shipment. When Holding is removed from the original document, the document is unblocked automatically and can be shipped as required.
Returns	RLM includes a returns request document that is used to control the return of materials and containers from an offshore location for various reasons, including repair, scrap, waste, return to base stock, and return to supplier. You specify the materials to be returned and this generates subsequent SAP documents, such as a material transfer or a delivery note. The subsequent documents are automatically linked to the returns request, which then serves as a controlling document for all returns activity.
Material Tracking	RLM provides a configurable reporting tool to allow you to track materials from the initiating document to the final receipt. Tracking is displayed in the form of a document flow in an expandable tree structure so that you can display as much of the flow as required. Status types are displayed for each document flow, depending on the level to which the flow has progressed. Up to five independent status types may be configured for each flow. Standard document flows are provided, but new ones can be created and configured using the navigation functions provided, or by writing custom navigation functions.

5.10.3.1.2 Service Station Retailing

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Service Station Retailing is part of SAP's Service Station and Convenience Retailing solution, which supports convenience retailing, fuel management, site and headquarters accounting, business analysis and reporting.

Key Features

The following table explains the key features available:

Key Feature	Use
Document Base Table	The Document Base Table (DBT) is a repository for data received from external systems and required for document creation. This typically includes transaction data from POS systems, sales meter readings, and dip readings. To improve performance and reduce data volume, data can be held in the DBT at an aggregated level. Subsequent processes, such as invoicing, settlement with clearing houses, and stock adjustment use the data held in the DBT.
Fuels Pricing	SSR allows you to: • Use market price watch as the basis for calculations of target prices for materials sold at the locations within your network • Display and maintain target prices at the location level for defined groups of materials and material /service type combinations • Simulate margins to check the profitability of new price proposals • Change target prices across the whole network or for selected locations • Track price changes • Send new prices only when there has been a price change, or according to other selection criteria.
Meter Readings	Oil companies use sales meter readings to calculate fuel sales volumes. The billing process can use this meter reading data to calculate the amount to claim from service station partners for fuel sold at a location. • Assign sales meters to locations • Assign meters to storage objects • Receive meter reading data from locations • Maintain meter reading data manually • Process errors that occur in the meter reading upload process • Use meter reading data to create billing and goods movement documents
Dip Readings	Oil companies use dip readings to calculate stock levels of bulk fuels within the service station network. You can use this data to correct current stock levels • Define storage objects at the business location level • Receive dip reading data from locations • Maintain dip reading data manually • Process errors that occur in the dip reading upload process • Use dip reading data to create goods movements • Display dip readings and differences between book and physical stock

Key Feature	Use
Payment Card Handling	To handle service station sales of products by payment card, SSR allows oil companies to: • Settle with clearing houses on behalf of service station partners and with fleet card companies directly. • Deduct the amount received from the clearing houses from the amount due from service station partners for sales recorded by meter readings or POS data. • Reconcile credit and Eurocheque card transaction data received from service station partners against data received from another external source

Settlement and Invoicing	Oil companies to recover funds from their service station partners follows below steps: You can invoice the partner for:
	• Sales of oil company-owned products such as fuels
	• A fee charged by the oil company for handling payment card settlement. The partner can be credited for:
	  ○ Sales of all products by credit cards, as the oil company will receive the money directly from the credit card clearing house.
	  ○ Sales of partner-owned products purchased by fleet cards at the service station.
	  ○ Commission on fuels sales

5.10.3.1.3 TD - Shipment Cost Processing

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

The solution calculates and settles shipment costs in transportation. The following items describe how the shipment costs are determined in the shipment, how they are transmitted to accounting, and how they are settled with the service provider. The system also shows you how to obtain information regarding the shipment costs to be expected in the order.

Key Features

The following table explains the key features available:

Key Feature	Use
Pricing procedure determination	The system determines the pricing procedure to be used to calculate shipment costs. Determination is carried out by transportation planning point, service agent, shipment cost item, and shipping type.
Determining the Calculation Base	The origin of the data upon which a condition type is based during shipment costing determines the calculation basis.
Determination of Geographical Influencing Factors	The following options are available for representing geographical considerations in transportation: • Distances • Locations and zones • Determination of the pricing date and the settlement date • Shipment Comparisons • Tax Determination

5.10.3.1.4 TSW - Freight costs

> **i Note**
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

In Trader's and Scheduler's Workbench, freight contracts represent agreements with a vessel carrier and contain the agreed upon terms, conditions and rates for bulk shipments. You can create freight contracts to represent agreements, such as time charters, voyage charters, or contracts of affreightment.

During scheduling, the system uses the data from freight contracts to calculate laytime, demurrage, and despatch. The system also compares voyage data with freight contracts to check if the time period, locations, and products scheduled for a shipment violate the agreement specified in the freight contract.

During scheduling, the system checks freight contracts for the following data:

- Vessel availability (system checks if freight contract exists)
- Freight costs (standard only)
- Laytime agreements

- Start and end events for laytime
- Demurrage rates

5.10.4 Public Services

5.10.4.1 Defense and Security

5.10.4.1.1 Military Planning and Operations

5.10.4.1.1.1 Force Generation

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Build forces with a single, integrated platform for managing personnel, material, and financial data in a table of organization and equipment (TOE). With integrated, real-time information, force planners can quickly generate forces for any domestic, administrative, or wartime activity based on the capabilities of their personnel, equipment, and budget.

Key Features

The following table explains the key features available:

Key Feature	Use
Integrate and manage information for a TOE on a single platform	• Get an overview of the availability, skills, and experience of your force members. • Get an overview of the equipment available to you.

Key Feature	Use
Organize and manage the capabilities of your force structures	Plan, create and then organize your force structures and equipment according to your needs.
Manage and develop flexible organizations	• Use the TOE to get a holistic, up-to-date view your force structures and equipment. • Identify available force elements and link them to new structures, or create new force element structures for defense/wartime.
Plan personnel staffing	• Automate processes for matching and securing the right personnel for operations and exercises. • Plan skill set required for the job. • Use the TOE to determine which personnel match the skill set. • Identify the most suitable candidates based on skill set, experience and availability.
Plan material and equipment	Enable force planners, material management officers and technical officers to plan, assign, and manage equipment efficiently using the TOE.
Plan finances and manage real estate	• Automate the creation and distribution of your financial data. • Mass create and control financial and business information. • Integrate this information for strategic and operational decision making. • Use real-time analytics to make more informed decisions and have accurate budgeting for your force structures.
Improve insight into operation readiness	Get an overview of your operational readiness using the TOE.

5.10.4.1.1.2 Force Deployment

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Force planners need to plan and deploy coordinated military missions. This involves organizational, personnel, material, financial, and budgeting processes for troop relocation, IT system setup, and readiness reporting.

Key Features

The following table explains the key features available:

Key Feature	Use
Options development: Plan and manage a table of organization	• Use a single, integrated platform for managing mission-critical information in the table of organization and equipment (TOE). • Integrate information on personnel, equipment, infrastructure, and finances. • Automate TOE to enable force planners better manage organization and equipment and to get better visibility into force structures, capabilities, and readiness resulting in greater operational agility.
Options development: Plan personnel staffing	• Automate processes for matching and securing the right personnel for operations and exercises. • Plan skill set required for the job. • Use the table of organization and equipment to determine which personnel match the skill set. • Identify the most suitable candidates based on skill set, experience and availability.
Options development: Plan material and equipment staffing	• Plan and execute supply chain activities and coordinate the supply chain network in the defense organization. • Define authorized materials to gain insight into inventory and equipment needs for force structures. • Plan, assign and manage materials for operations and exercises in the TOE.
Options development: Financial planning and real estate management	• Automate the creation and distribution of your financial and real estate data for operations and exercises. • Plan and allocate budget for different phases of operations and exercises. • Control and integrate financial and real estate information for strategic and operational decision making.
Plan execution: Relocation	Relocate troops in a strategic and cost-effective manner: • Get real-time accurate information on troops, equipment and transportation. • Use information to coordinate the movement of materials and personnel.
Plan execution: Operational readiness	Improve insight into personnel and materials readiness for operations and exercises: • Get a holistic view of the readiness across various force structures. • Quickly and accurately plan operations and exercises.

5.10.4.1.2 Military Supply Chain

5.10.4.1.2.1 Defense Replenishment and Planning

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Plan and execute replenishment of materials and equipment.

A military supply chain requires high performance in planning and executing the replenishment of consumable goods and defense equipment. To establish combat readiness, you must simultaneously integrate and automate logistics and fulfillment across your warehousing, transportation, and distribution processes. Collect and analyze the internal demand signals of a defense organization to create and update optimized demand plans. Quickly, accurately, and transparently match the goods demands of agile forces with supplies in a prioritized and multilevel defense supply network to achieve high delivery performance and establish combat readiness of service members. Relocate troops for operations or exercises with specific, flexible, and prioritized supply planning and execution. Manage storage, warehousing, and global inbound and outbound transportation in supply replenishment with increased accuracy, visibility, and performance.

5.10.4.1.2.1.1 Defense Supply Planning and Execution

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Quickly and efficiently match the goods demands of agile forces with supplies in a prioritized and multilevel defense supply network to achieve high delivery performance and establish combat readiness of service members.

Key Features

The following table explains the key features available:

Defense Supply Planning and Execution

Key Feature	Use
Integrate organizational data, logistic data, and material management data	• Get an overview of the materials available to you. • Remove negative data sources that influence supply data integrity.
Defense supply planning	• Automate planning runs • Improve supply planning system and prioritize requirements for provision materials. • Match goods demands with supplies to ensure combat readiness. • Improve inventory accuracy and increase inventory turnover
Equipment planning	Plan equipment replenishment for units in armed forces, police, or aid groups to ensure optimized stocking and usage: • Determine the source of supply for your equipment. • Plan and manage equipment efficiently. • Track the loaning of equipment and its return.
Initial supply	Determine what is required for the initial supply of units in the armed forces, the police, or aid groups: • Plan provisions required by each organizational unit • Deliver the right provisions, to the right place, at the right time
Defense supply operation	• Process supplies based on prioritized requirements. • Plan and manage provisions efficiently. • Improve inventory accuracy. • Reduce order fulfillment lead time.

5.10.4.1.2.1.2 Defense Relocation Planning and Execution

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

The relocation of troops for operations and exercises requires specific, flexible and prioritized supply planning and execution.

Key Features

The following table explains the key features available:

Key Feature	Use
Plan relocation	• When relocating an armed force, the police, or aid group, determine what equipment and goods are required and where. • Optimize the relocation of equipment and consumable goods. • Get an overview of what has been approved or already deployed to an organization's location.
Process supplies during the relocation of defense forces	• Consider prioritized goods during supply processing. • Efficiently process supplies by utilizing the integration of organizational, logistics and material management data.

5.10.4.1.2.1.3 Defense Inventory and Movement Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Manage storage, warehousing, and global inbound and outbound transportation in supply replenishment with increased accuracy, visibility, and performance.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage defense inventory and movement	• Manage inbound and outbound processing of supplies. • Enable supply personnel to handle dangerous goods using packing and unpacking functionality. • Optimize the processing of supplies for an organizational structure by utilizing highly-integrated organizational, logistics, and materials management data.
Manage defense warehousing	• Manage both the inbound and outbound warehouse processing activities for armed forces, the police, and aid organizations. • Improve supply chain integrity. • Streamline data sources in order to ensure more efficient warehouse operations.
Plan and process defense transportation	• Optimize transport activities. • Plan and manage transport of equipment and spares. • Plan and execute relocations within organizations using relocation-specific transport handling.

5.10.4.1.2.2 Defense Equipment Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Within an organization equipment can be managed and assigned to its personnel based on equipment type, personnel function, and authorization status. Tracking of supply levels as well as equipment status needs to be possible quickly and accurately.

Key Features

The following table explains the key features available:

Key Feature	Use
Manage structural equipment	• Handle requests for and loans of structural equipment, along with their return. • Assess inventory levels and adjust facility supplies. • Get information on detailed equipment levels, equipment deployed to units, and equipment availability.
Manage functional equipment	• Track functional equipment supplied to authorized personnel. • Issue required functional equipment based on assigned and authorized functional equipment status. • Plan and execute the return of functional equipment issued to personnel.
Manage personal equipment	• Issue required personal equipment based on assigned and authorized personal equipment status. • Track the status of personal equipment and support the return process. • Ensure optimized stocking and usage of equipment.

5.10.4.2 Higher Education and Research

> **i** Note
>
> If you use Higher Education and Research as part of the SAP S/4HANA Compatibility Packs, please note that the features of Higher Education and Research as described in chapter SAP S/4HANA IndustrySpecific LoB Functions are not available in SAP S/4HANA Cloud, private edition. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

5.10.4.3 Public Sector

5.10.4.3.1 Social Benefit Calculation

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Social benefits are calculated and paid out using an automated back-end accounting process in Social Services in conjunction with the Public Sector Collections and Disbursement (PSCD) component.

The features described below only work in conjunction with the SAP CRM part of the Social Benefit Decision Making solution.

Key Features

Key Feature	Use
Gross Calculation	The system calculates benefit entitlement amounts and prepares the periodic payment amounts.
Net Calculation	The system bundles payment and deduction items in net calculation documents.
Social Billing	The system prepares billing documents, for example as the basis for the payment run that is executed in Public Sector Collection and Disbursement (PSCD).

5.10.5 Services

5.10.5.1 Engineering, Construction, & Operations

5.10.5.1.1 Equipment and Tools Management

> **i** Note
>
> Please note that for customers using SAP S/4HANA Cloud, private edition, features mentioned in this chapter might be unavailable, restricted and/or might require a separate license. For further information on SAP S/4HANA Cloud, private edition, please contact your SAP Account Executive.

Business Background

Equipment and Tools Management (ETM) addresses the requirements of self-performing construction companies, building contractors, and equipment distributors by handling business processes such as planning, processing, and settlement and evaluation of resources (equipment and materials).

ETM allows you to deliver equipment and materials to the appropriate locations and to monitor equipment performance and use over time. You can plan deliveries, create and manage requisitions, generate shipping documentation, and track the location and performance of equipment, from acquisition through retirement.

With ETM, you can improve the availability and tracking of equipment, manage the increasing administrative workload, and reduce handling and administration costs. You can also introduce flexible prices and account determination, optimize equipment utilization, and improve the visibility of profitability, total cost of ownership, and return on asset and equipment.

Key Features

The following table explains the key features available:

Key Feature	Use
Equipment resource management and monitoring	You use this feature to plan equipment and tools requirements and to plan deliveries, generate shipping documentation, and track the location and performance of equipment and tools.
Equipment cost settlement	You use this feature for flexible price and account determination as well as time-based and consumption-based pricing.

6 Integration

SAP S/4HANA currently supports the integration with other SAP products. The following integration scenarios are available for SAP S/4HANA. Please note that you might need a separate license. For further information, please contact your SAP Account Executive.

Business Network Integration

Ariba Network Integration

SAP S/4HANA currently supports integration scenarios with Ariba Network that enable you to identify sources of supply for purchase requisitions in SAP S/4HANA, using the community of suppliers on Ariba Network. Once your suppliers are registered on Ariba Network, SAP S/4HANA offers seamless purchase order and invoice collaboration processes with your suppliers.

For more information, see:

- Source Assignment [page 147]
- Purchase Order Collaboration [page 156]
- Invoice Collaboration [page 160]
- Dynamic Discounting (Ariba Network Integration) [page 40]
- Payment Advice Collaboration (Ariba Network Integration) [page 41]

Integration with External Procurement Systems

SAP S/4HANA supports the integration with external procurement systems (SAP Ariba and SAP Fieldglass, for example). By combining the advantages of the external system with the integrated business processes and data transparency provided by SAP S/4HANA, SAP provides an optimized portfolio for the procurement of materials, services, temporary labor, and contingent workers.

For more information, see Integration with External Procurement Systems [page 455].

Integration with SAP SuccessFactors Employee Central

SAP S/4HANA currently supports the integration scenario with the SAP SuccessFactors Employee Central using the HANA Cloud Interface (HCI) to enable replication of employee, organizational, and cost center data.

For more information, see Employee Central Connectivity (Integration with SAP SuccessFactors) [page 55]

Integration with Concur Solutions

SAP S/4HANA currently supports the integration with Concur solutions to simplify your expense processes in the areas of master data export and financial posting of your Concur documents.

Integration with SAP Global Trade Services

SAP S/4HANA supports the integration with SAP Global Trade Services to offer additional processes for your international supply chain.

Integration with SAP Manufacturing Suite

SAP S/4HANA currently supports the integration with SAP Manufacturing Suite to enable the management and control of manufacturing operations, setting up the connection to locally installed systems and machines on the shop floor and data collection. The SAP Manufacturing Suite consists of three products:

- SAP Manufacturing Execution
- SAP Manufacturing Integration and Intelligence
- SAP Plant Connectivity

Integration with Industry Cloud Solutions from SAP

SAP S/4HANA supports the integration with industry cloud solutions from SAP by enabling you to replicate SAP S/4HANA business object data (for example, master data, transaction data, or configuration data) to industry cloud solutions.

Integration with Visual Enterprise Solutions

SAP S/4HANA currently supports the integration with Visual Enterprise solutions to enable the reuse of engineering visualization data for technical communications, restructuring, analytic dashboarding, and other workflows.

Integration with SAP Advanced Track and Trace for Pharmaceuticals

SAP S/4HANA currently supports integration with SAP Advanced Track and Trace for Pharmaceuticals. This includes the necessary enhancements to ensure master data integration, transactional data integration and warehouse integration from SAP S/4HANA to SAP Advanced Track and Trace for Pharmaceuticals.

Integration with Digital Payment Hub

SAP S/4HANA supports integration with a digital payment hub by SAP (currently the SAP digital payments add-on) to process payment card payments and other digital payments, such as in the areas of Accounts Receivable, Sales, Business Partner, or Contract Accounting.

> **i** Note
>
> If you want to process payment card payments and other digital payments with SAP S/4HANA Cloud, private edition or SAP S/4HANA Cloud, extended edition, integration with a digital payment hub by SAP (currently the SAP digital payments add-on) is mandatory to assure compliance with the Payment Card Industry Data Security Standard (PCI DSS).

If SAP S/4HANA is integrated with a digital payment hub by SAP (currently the SAP digital payments add-on), you can use this feature to connect SAP S/4HANA with your payment service providers so that you can run digital payment processes, such as authorizations, charges (captures), refunds, and digital advices.

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