Unit 8 – Scope management

Unit 7 - Learning Objectives

To gain an understanding of effective project scope management in terms of:

- What scope is
- Why it is important to manage the project scope efficiently
- What a WBS is
- What a PBS is
- What a CBS is
- What a responsibility assignment matrix is
- How the different breakdown structures interact
- How data-centric coding can support project controlling

Scope management

The scope of a project is the totality of the outputs, outcomes and benefits and the work required to produce them (APM BoK).

Scope management is the process whereby outputs, outcomes and benefits are identified, defined and controlled (APM BoK).

- **Outputs:** The products produced by a project. An electron microscope is an example.
- **Outcomes**: the changed circumstances or behaviour that results from the use of an output and leads to realisation of benefits. The electron microscope has given the organisation a new capability to identify new strains of bacteria.
- **Benefits:** By having the new capability, the organisation is able to develop new treatments for bacterial infections.

In essence the scope of a project is all of the products to be produced, all of the work undertaken and all of the benefits to be derived from the use of those products.

The process includes:

- High level scope definition recorded in the business case in support of the chosen option. In defining the scope, it is important to define the boundaries and interfaces with adjacent projects and other work. This will avoid duplication of effort, conflict and omissions.
- Gathered and categorised requirements (i.e. what the outputs must do to deliver the benefits). These are then baselined.
- Detailed scope definition. The project manager directs the requirements to the most suitable technical resource for this activity. The baseline scope is defined through breakdown structures including:
- Product (or service) breakdown structure – what will be delivered
- Work breakdown structure – activities to be completed
- Cost (or organisation) breakdown structure – the labour or non-labour resources needed to complete the work
- Controlling the scope through the use of change control and configuration management (including version control).

Factors when developing scope

These include:

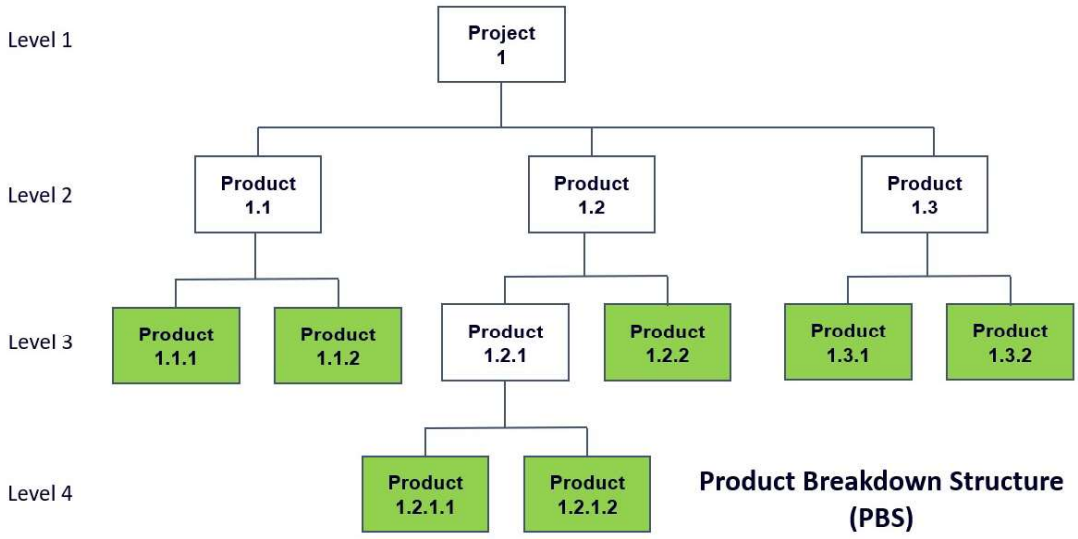
- What products are required (in scope) to deliver the capability needed for benefits realisation. Each item in scope will need to directly contribute to a benefit. Management of this linkage will ensure that all work done in the project has value. This will also allow a prioritisation of tasks to produce the minimum level of benefits desired by the organisation.
- Where the boundaries and the main constraints of the project are. This line will determine what is in and what is out of scope. It will prompt a review of the interfaces between what the project is delivering and what it is not delivering. An example is where a new software project is required to be installed with an existing hardware system.

- Assumptions. These should be documented so that they can be tested. For example, a project sponsor may assume that a project to develop a management system also includes certification of that system. If this is not the case, additional cost will be incurred. This clarity helps project managers avoid “scope creep,” which occurs when deliverables that were not part of the original scope statement are added to a project mid-stream.
- The resources available. Who will be available to deliver the scope? Where there are limited resources the scope may have to be reduced based on a priority basis.

Breakdown structures used to develop scope

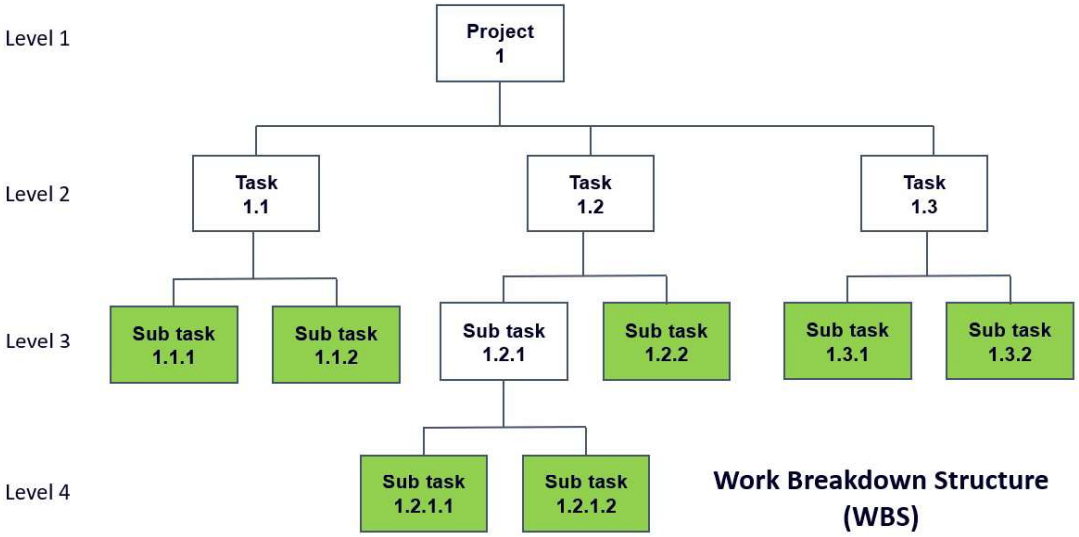
Product based planning focuses on all of the tangible products (management and specialist). The tool used is a **product breakdown structure (PBS).** This is a hierarchical breakdown of the project in terms of products/outputs which can be defined in terms of their quality and acceptance criteria. This reduces ambiguity regarding final acceptance.

The PBS uses nouns to describe the scope. This allows the team and stakeholders to visualise all of the products in categories. This makes it easier to identify missing items and manage stakeholder expectations and allows estimate of the components of the project to be obtained.

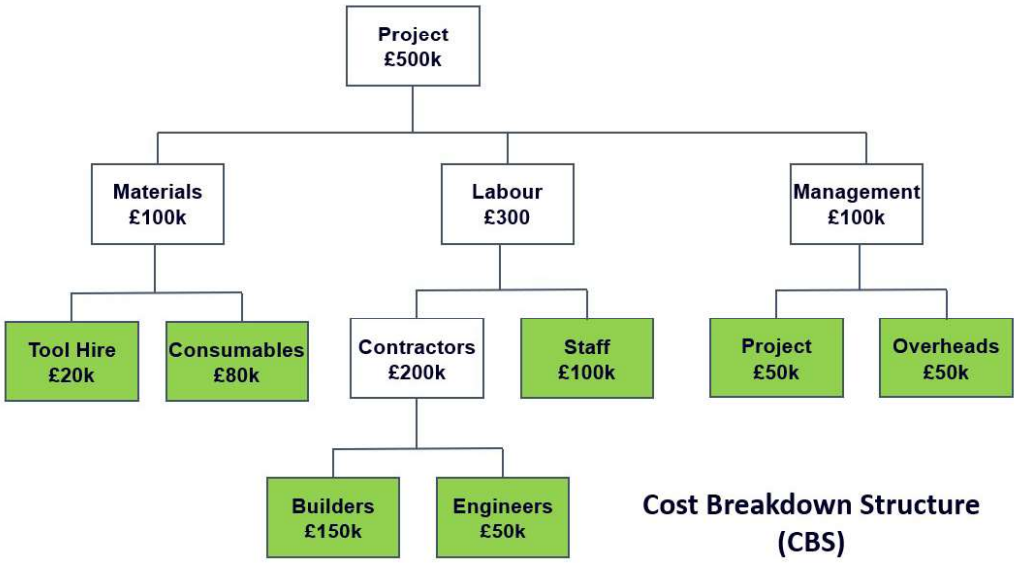


Work based planning focuses on the activities that need to be done. The tool used is a **work breakdown structure (WBS)**. This is a hierarchical breakdown of the project in terms of activities/work and provides a basis for estimation of effort and allocation of work packages.

The WBS is often used at the detailed planning stage and uses verbs to describe the scope. This allows estimating of the effort (man/hours) of the activities to be performed and facilitates the creation of work packages. It also creates ‘codes’ that can be used for reporting against estimates.



The cost breakdown structure (CBS) is a hierarchical structure used to organise the project costs according to category, often aligning them with the organisation's budgeting system. It facilitates tracking the budget performance of the project (APM BoK).



Responsibility assignment matrix

A responsibility assignment matrix is a chart or a diagram showing assigned responsibilities for elements of work. It is created by combining the work breakdown structure with the organisational breakdown structure (APM BoK).

The OBS shows the team roles available to the project. When it is combined with the work breakdown structure (WBS) it can be used to show who is available and allocated to complete elements of work, either at an activity or a work package level. This ensures that:

- there is clarity in task allocation which supports resource planning.
- resource owners (e.g. line managers) can provide support as they are aware of the allocated tasks.

When the OBS is combined with a product breakdown structure (PBS) is can be used to show who is allocated to produce the project outputs. This can either be at component level (e.g. single component) or a complete category of outputs (e.g. a complete assembly). This ensures that:

- there is clear ownership of product development.

  there is a clear point of contact for product-related information including progress status and technical information.

A RACI (or similar) 'code' can be added to the responsibility assignment matrix (also known as a RACI matrix) to describe how various roles participate in completing tasks or deliverables for a project. RACI is an acronym that describes four key responsibilities:

- **R – Responsible**. Those who are responsible for carrying out the task (or collection of tasks as part of a work package). There should only be one person responsible
- **A – Accountable.** Those accountable for getting the task completed. Accountability cannot be delegated.
- **C – Consulted.** Those consulted in the execution of the task e.g. consult a more senior project manager or specialist who has done something similar before. *Consulted* parties are typically the people who provide input based on either how it will impact their future project work or their domain of expertise on the deliverable itself. Consultation is usually a two-way communication process.
- **I – Informed.** Those that need to know of the decision or action e.g. site security when expecting a project delivery. These team members simply need to be kept in the loop on project progress, rather than roped into the details of every deliverable. This is usually more one-way communication.

This provides a useful visual of the allocation of responsibilities and provides clarity to all involved.

	Project Manager	Designer	Buyer	Ops Manager
Survey site	I	R		AC
Identify risks	RA	C		I
Place contract	AC	C	R	I
HSE assessment	R	I		A

The following diagram shows a more detailed RACI matrix with work package codes (from WBS):

	Work Packages					
	1.2.1.1.	1.4.2.1.	2.2.3.2	2.3.1.1.	3.1.2.3.	3.2.1.1.
Sponsor	A	I	I	A	I	C
PM	R	A	A/R	R	A	A
Contractor		R	I	I	C	R
Architect		C	I		R	
Client	I	C	C		C	I
T.U.	I	I	C	C		I

Coding of scope

A robust WBS hierarchically and faithfully reflects all project tasks and work packages so that projects are easier to manage. In order to achieve the project objectives, the ISO 21500 standard suggests that the WBS must state all project deliverables and break them down into smaller packages.

All WBS elements must include identification codes aligned with the configuration management plan. This way, the PM team can control the progress and assign responsible people to each of them.

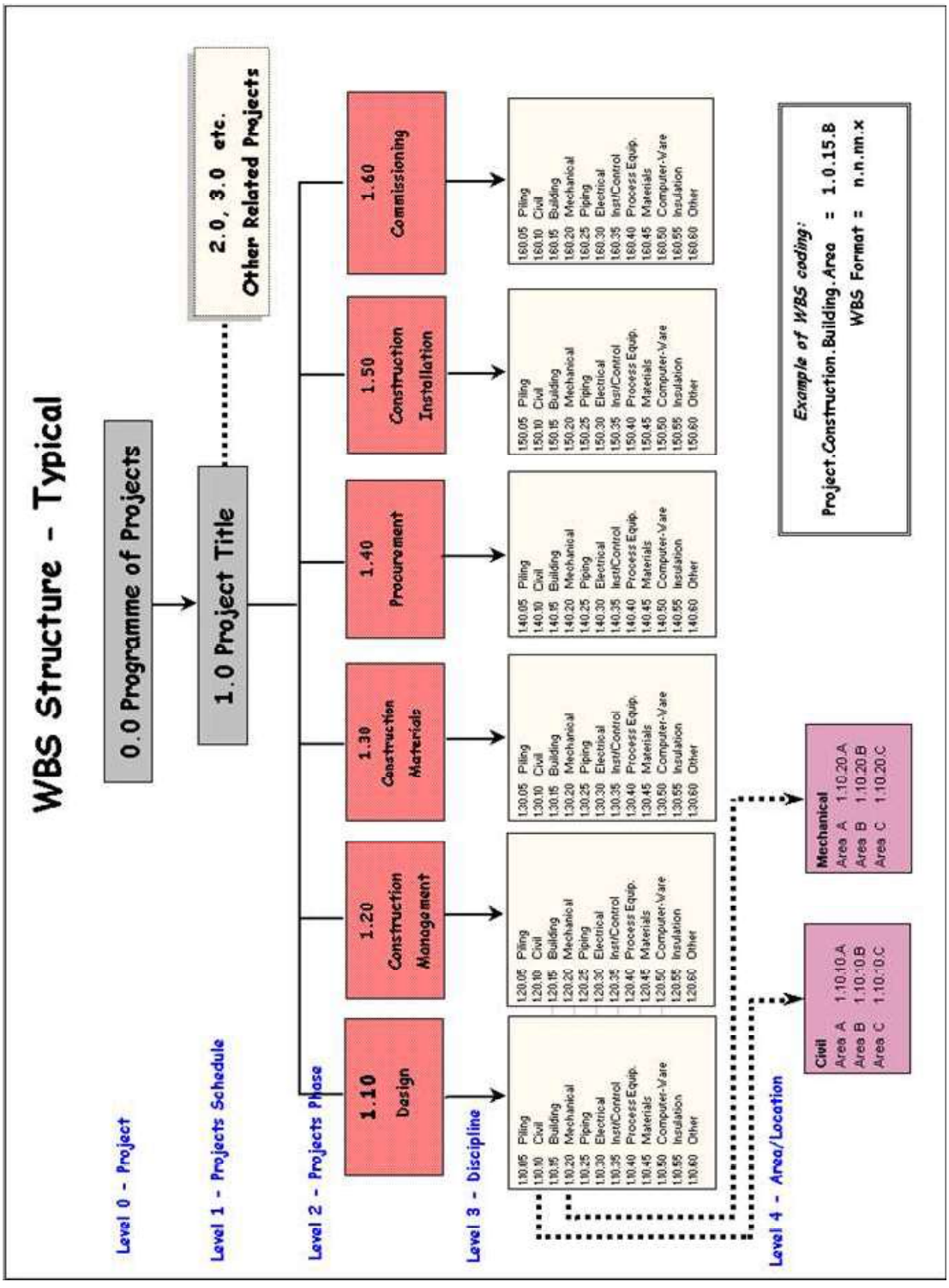
In order to classify the information contained within the WBS it needs a coding system. The WBS can then be used for archiving and retrieving project information, tracking and reporting purposes. Choosing a classification system is the first step when preparing the WBS and needs careful though and design. Factors that should be considered include:

- The level of detail required for estimating and tracking
- Integration with other control systems and organisational preferences/policies
- Alignment with the CBS

The CBS enables costs to be collected, analysed, and reported for any cost-generating item. These costs are also consolidated in a similar manner to the WBS. The codes of both systems may even be similar. However, the lower level of the CBS is generally known as the cost account (CA). The CA is the counterpart of the Work Package in the WBS. The CA is a natural and logical management centre in which the costs of the work to be performed are integrated.

In conclusion, the codes provide a mechanism against which resources (hours of effort and money) can be allocated and baselined against which actual usage can be compared and tracked.

The following WBS shows an example of coding:



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