CS352– ADVANCED DATABASE SYSTEMS

UNIT 5 – KNOWLEDGE MANAGEMENT

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Agenda

- Value of Business Intelligence
- Knowledge as an Asset
- Preservation of Knowledge
- Business Intelligence and Systemic Changes
- Strategic Competitive Advantage
- Individual Project

VALUE OF BUSINESS INTELLIGENCE

What is Business Intelligence (BI)?

Definition: Business Intelligence (BI) refers to the strategies and technologies used by enterprises for the data analysis of business information.

Key Components:

- Data Warehousing: Centralized repository for storing data.
- Data Mining: Extracting patterns from large datasets.
- Reporting: Generating summaries and insights from data.
- OLAP: Analyzing data from multiple perspectives.

Why Business Intelligence Matters

- **Informed Decision-Making**
- **Competitive Advantage**
- **Operational Efficiency**
- **Risk Management**

Key Benefits

- **Improved Data Quality**
- **Real-Time Insights**
- **Enhanced Customer Experience**
- **Increased Revenue**
- **Cost Reduction**

BI Tools and Technologies

Examples: Tableau, Power BI, QlikView, SAP BusinessObjects.

Features:

- Data visualization
- Dashboards
- Reporting
- Predictive analytics

Selection Criteria:

- Scalability
- Ease of use
- Integration capabilities
- Cost

Real-World Examples

Company A:

- **Challenge**: Inefficient sales forecasting.
  - **Solution**
  - **Result**

Company B:

- **Challenge**: Ineffective customer segmentation.
  - **Solution**
  - **Result**

Company C:

- **Challenge**: Complex financial reporting.
  - **Solution**
  - **Result**

Challenges in Implementing BI

- **Data Integration**
- **Data Quality**
- **User Adoption**
- **Cost**

Overcoming BI Challenges

Best Practices

Data Governance

Training Programs

Vendor Support

The Future of Business Intelligence

- **AI and Machine Learning**
- **Natural Language Processing**
- **Self-Service BI**
- **Big Data Integration**

KNOWLEDGE AS AN ASSET

Understanding Knowledge as an Asset

- **Definition**: Knowledge as an asset refers to the value derived from leveraging intellectual capital and expertise within an organization.

- **Importance**: Critical for innovation, decision-making, and maintaining competitive advantage.

Types of Knowledge

Explicit Knowledge

- Examples: Manuals, procedures, databases.

Tacit Knowledge

- Examples: Skills, experiences, insights.

Value of Knowledge

- **Enhances Innovation**
- **Improves Efficiency**
- **Supports Decision-Making**
- **Builds Competitive Advantage**

Knowledge Management

Definition: The process of capturing, distributing, and effectively using knowledge.

Key Components:

- Knowledge Creation
- Knowledge Storage
- Knowledge Sharing
- Knowledge Application

Strategies for Managing Knowledge

- **Knowledge Repositories**
- **Communities of Practice**
- **Mentorship Programs**
- **Continuous Learning**

Tools for Knowledge Management

- **Document Management Systems**
- **Collaboration Tools**
- **Knowledge Bases**
- **Learning Management Systems**

Real-World Examples

- **Company A**
- **Company B**
- **Company C**

Challenges in Knowledge Management

- **Knowledge Silos**
- **Resistance to Sharing**
- **Maintaining Up-to-Date Information**
- **Measuring ROI**

Overcoming Knowledge Management Challenges

- **Breaking Down Silos**
- **Incentivizing Sharing**
- **Regular Updates**
- **Tracking Metrics**

The Future of Knowledge Management

- **Artificial Intelligence**
- **Big Data Analytics**
- **Mobile Knowledge Management**
- **Social Media Integration**

PRESERVATION OF KNOWLEDGE

Introduction to Preservation of Knowledge

- **Definition**: Knowledge preservation involves maintaining and safeguarding information and cultural heritage for future generations.
  - **Importance**
  - **Examples of Knowledge Loss**

Historical Methods of Knowledge Preservation

- **Oral Traditions**
- **Manuscripts and Scrolls**
- **Early Libraries and Archives**
    - **Example**

Modern Techniques for Knowledge Preservation

- **Digital Archives**
- **Cloud Storage**
- **Physical Methods**
- **Open-Access Repositories**
    - **Example**

Challenges in Preserving Knowledge

- **Digital Decay and Obsolescence**
- **Data Privacy and Security**
- **Resource Limitations**
- **Legal and Ethical Considerations**

Case Studies

- **Google Books Project**
- **UNESCO Memory of the World Programme**
- **Local Community Archives**

Future of Knowledge Preservation

- **Emerging Technologies**
- **Collaborative Global Efforts**
- **Potential Risks and Solutions**
- **Vision for the Future**

BUSINESS INTELLIGENCE AND SYSTEMIC CHANGES

Introduction to Business Intelligence (BI)

- **Definition**: Business Intelligence (BI) refers to the strategies and technologies used by enterprises for data analysis of business information.
  - **Historical Development**
  - **Key Objectives**

Components of Business Intelligence

- **Data Warehousing**
- **Data Mining.**
- **Online Analytical Processing (OLAP)**
- **Reporting and Querying Software**
- **Dashboards and Data Visualization**

Importance of Business Intelligence

- **Enhancing Decision-Making**
- **Improving Operational Efficiency**
- **Gaining Competitive Advantage**
- **Supporting Strategic Planning**

Systemic Changes in Business

- **Definition**: Fundamental changes in the structure and operations of businesses driven by external and internal factors.
- **Drivers**:
  - **Technology**
  - **Globalization**
  - **Market Dynamics**
    - **Examples**

Role of BI in Systemic Changes

- **Identifying Trends and Patterns**
- **Predictive Analytics and Forecasting**
- **Real-Time Data Access and Decision-Making**
  - **Case Examples:**
    - **Retail**
    - **Healthcare**
    - **Finance**

Case Studies

- **Retail Industry**
- **Healthcare Industry**
- **Financial Services Industry**

Challenges and Solutions

- **Data Quality and Integration Issues**
- **Scalability and Performance Concerns**
- **User Adoption and Training**
- **Solutions**

Future Trends in BI and Systemic Changes

- **Artificial Intelligence and Machine Learning**
- **Big Data and Advanced Analytics**
- **Cloud-Based BI Solutions**
- **Future Outlook**

STRATEGIC COMPETITIVE ADVANTAGE

Introduction to Strategic Competitive Advantage

- **Definition**: Explanation of what strategic competitive advantage means.
- **Importance**
- **Overview**

Key Concepts and Definitions

- **Competitive Advantage**
- **Sustainable Competitive Advantage**
- **Strategic Management**.

Types of Competitive Advantage

- **Cost Leadership**
- **Differentiation**
- **Focus**
- **Examples**

Sources of Competitive Advantage

- **Resources**
- **Capabilities**
- **Core Competencies**
- **Value Chain Analysis**

Strategies for Gaining Competitive Advantage

- **Innovation**
- **Customer Relationship Management**
- **Operational Efficiency**
- **Marketing Strategies**

Case Studies

- **Case Study 1**: Analysis of Apple's competitive strategies.
- **Case Study 2**: Analysis of Walmart's cost leadership.
- **Case Study 3**: Analysis of Tesla's innovation and differentiation.

Case Studies

- **Case Study 1: Analysis of Apple's competitive strategies.**
  - **Differentiation**
  - **Innovation**
  - **Brand Loyalty**
  - **Ecosystem Integration**
  - **Results**
- **Case Study 2: Analysis of Walmart's cost leadership.**
  - **Cost Leadership**
  - **Operational Efficiency**
  - **Supplier Relationships**
  - **Market Penetration**
  - **Results**

Case Studies

- **Case Study 3: Analysis of Tesla's innovation and differentiation.**
  - **Innovation**
  - **Differentiation**
  - **Vertical Integration**
  - **Brand Image**
  - **Results**

Challenges in Sustaining Competitive Advantage

- **Market Dynamics**
- **Competitor Actions**
- **Technological Changes**
- **Internal Challenges**

Role of Technology in Competitive Advantage

- **Digital Transformation**
- **Big Data and Analytics**
- **AI and Automation**
- **Case Example**

Future Trends in Competitive Advantage

- **Emerging Technologies**
- **Globalization**
- **Sustainability**
- **Adaptability**

INDIVIDUAL PROJECT

Individual Project

Description

- Based on the feedback you have received with respect to your data model and DDL, now is your chance to implement the final changes. Make any needed ERD and Physical Data Model changes and submit for final review. Include any SQL needed for the database, the DDL, the DML to manage the customer and employee rows, and the 3 SELECT statements.
- In addition, submit the star schema and the DDL to create the Star schema for the data warehouse. You want a single Fact table to track all orders with the following dimensions:
  - Time
  - Customer
  - Product
  - Employee
- Be sure to include all DDL, including primary and foreign keys; feel free to create new or needed primary keys. Finally, a specific and detailed discussion about the ETL process will be used to move data from the OLTP environment to the data warehouse.

Individual Project

Your submission should include the following:

- A description of your approach
- The features of your enhanced ERD
- A discussion about handling the M:M relationship between customer and products
- The approach used to ensure 3NF
- Required SQL statements for the database
- Star schema for the fact table and its 4 dimension tables
- The DDL for the Star schema for the data warehouse
- A description of the ETL
  - Add the Data Warehouse Design and discussion about the ETL process to the project template section titled "**Web and Data Warehousing and Mining in the Business World**."
  - Name the document **CS352_<First and Last Name>_IP5**.docx

Individual Project

Submit your Word document and make sure that it contains:

- A Screenshot of the ERD, logical data model from previous assignments.
- The DDL to create the tables, including the table definition and the primary and foreign key definitions
- 1–2 pages describing the solution
- Star Schema
- DDL for a Star schema
- 2-3 paragraphs about the ETL process
  - **Please submit your assignment.**
  - **For assistance with your assignment, please use your textbook and all course resources.**

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