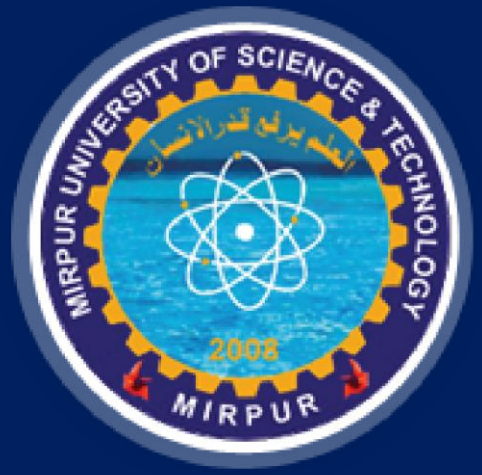


MUST

Wisdom & Virtue

# MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY
# DEPARTMENT OF SOFTWARE ENGINEERING

# Business Intelligence

*(Lecture # 2)*

## History & Definitions of BI

*(Lecturer)*

# Lecture Contents

- Definition of Business Intelligence
- Features Of BI
- Business Intelligence perspectives
- Business Intelligence views
- Business Intelligence goals

# Origin of the Term Business Intelligence

**Coined by H.P. Luhn (IBM) in 1958**

- Defined intelligence as: *"the ability to apprehend the interrelationships of presented facts in such a way as to guide action towards a desired goal."*
- Refers to the ability to acquire and apply knowledge and skills effectively.

**Definition of Business:**

- *"A collection of activities carried out for various purposes, including science, technology, commerce, industry, law, government, defense, and more.*

# Business Intelligence and Decision Support Systems

- Business Intelligence (BI) has its roots in **Decision Support Systems (DSS)** and is closely linked to **Operations Research (OR).**
- **Operations Research (OR):** A systematic approach to problem-solving and decision-making using mathematical analysis.
- **Key OR Approach:** Breaking down complex problems into components and solving them step by step.
- **Application in BI:** Helps organizations optimize decision-making through data-driven insights and predictive analytics.

# Evolution of Business Intelligence

- With the increasing availability of data, Business Intelligence (BI) evolved to emphasize data-driven decision-making.
- **Reintroduction of the Term BI (1989)**
- **Howard Dresner (Gartner Group)** redefined the term **Business Intelligence (BI)** in 1989.
- The focus shifted towards **data warehousing, reporting, and analytical processing** as core components of BI.
- **Key Developments in BI**
- **Data Warehousing:** Became the foundation of BI, enabling large-scale data storage and retrieval.
- **OLAP (Online Analytical Processing):** Emerged as a powerful tool for multidimensional data analysis.
- **Reporting Tools:** Gained prominence as essential decision-support instruments.
- **Davenport's Perspective on BI**
- **Thomas Davenport** suggested that **Business Intelligence** is primarily concerned with:
  - **Analysis** of data to extract insights.
  - **Reporting** to present meaningful information.
  - **BI Software** for automating data processing and visualization.

# The Evolving Business Environment & BI

**Constantly Changing Business Landscape**

- The business environment is becoming increasingly **complex** and **dynamic** over time.
- Organizations need to **adapt quickly** to sudden changes to remain competitive.
- This requires making **frequent and fast decisions** at **strategic, tactical, and operational levels**.

**Key Business Intelligence Techniques**

- **Multidimensional Analysis**
  - Examines data from multiple perspectives to uncover insights.
  - Helps in understanding patterns, trends, and correlations.
- **Mathematical Projection**
  - Uses statistical models and algorithms to predict future outcomes.
  - Supports data-driven forecasting and risk assessment.
- **Data Modeling**
  - The process of analyzing, structuring, and defining relationships between different data points.
  - Enhances data consistency and supports better decision-making.
- **Dashboards**
  - A business intelligence tool that enables users to **track, analyze, and report** key performance indicators (KPIs).
  - Provides real-time data visualization for quick and informed decision-making.

# Features of Business Intelligence (BI)

- **Task of BI**
- The primary goal of BI is to **support decision-making** for specific business objectives.
- BI operates across various **domain areas** while considering organizational and institutional factors.
- Helps businesses make **data-driven decisions** aligned with their strategic goals.
- **2. Foundation of BI**
- BI relies on **empirical data**, which is gathered through observation and experimentation.
- Apart from raw data, BI also integrates **knowledge, theories, and predictive models** to enhance decision-making.
- Empirical data ensures BI insights are **scientifically grounded and actionable**.
- **3. Realization of BI**
- BI decision support is implemented through **Information and Communication Technologies (ICT)**.
- Uses **advanced analytics, AI, and machine learning** to extract meaningful insights.
- BI systems transform raw data into **structured, actionable intelligence**.
- **4. Delivery of BI**
- A BI system must ensure that the **right information** reaches the **right people** at the **right time**.
- Information should be presented in an **easy-to-understand format** (e.g., reports, dashboards, and visualizations).
- Timely and well-structured data improves **efficiency, productivity, and decision-making accuracy**.

# Actual Challenges

**1.Process Understanding and Workflow Integration**

- Enhancing BI by integrating **better process understanding** and workflow analysis.
- Incorporating **process mining** to uncover inefficiencies and optimize operations.

**2. Adapting to New Organizational Structures**

- BI must evolve to support **dynamic and flexible organizational models**.
- Requires adjusting to **decentralized teams, remote work environments, and agile business processes**.

**3. Handling New Data Sources**

- Traditional structured data is now complemented by:
  - **Web data** (user interactions, online behavior)
  - **Semi-structured data** (emails, XML, JSON)
  - **Text data** (customer reviews, social media)

# Actual Challenges

**4. Developing New Analytical Methods**

- Advanced analytics for handling **unstructured and opinion-based data**.
- Techniques include:
  - **Text mining** (extracting insights from textual data)
  - **Opinion mining** (analyzing customer sentiment and feedback)

**5. Leveraging Modern IT Facilities**

- BI systems must utilize cutting-edge technologies, including:
  - **Software as a Service (SaaS)** for cloud-based BI solutions.
  - **Big Data and Cloud Computing** for scalable data processing.

**6. Supporting New Devices & Real-Time Decision Making**

- Integration with **mobile devices** to provide BI access anytime, anywhere.
- Implementing **real-time decision support systems** for instant business insights.

# Key Areas of Business Analytics

- **1. Business Analytics**
- Focuses on **discovering new insights** and gaining a deeper **understanding of business operations**.
- Helps organizations make **data-driven decisions** to improve efficiency and competitiveness.
- **2. CRM (Customer Relationship Management) Analytics**
- Analyzes customer data to enhance **customer relationships and retention**.
- Helps in **personalizing marketing strategies** and improving customer satisfaction.
- **3. Predictive Analytics**
- Uses **statistical models** and **machine learning algorithms** to forecast **future business trends and events**.
- Helps in **risk management, demand forecasting, and fraud detection**.
- **4. Data Mining**
- Extracts meaningful patterns and insights from **large data sets**.
- Identifies **hidden trends, correlations, and business opportunities**.

# Understanding Business in BI

- **Definition of Business**
- Business refers to **any organizational activity** focused on **delivering goods or services** to consumers.
- Can range from **small enterprises** to **large multinational corporations**.
- **2. Size of Business**
- The **size of an enterprise** affects how BI is implemented.
- BI strategies must be adaptable to **small businesses, medium enterprises, and large corporations**.
- Allows for **scalability and generalization** to similar business models.
- **3. Scope of Business**
- The **complexity of activities** determines the level of BI needed.
- Businesses with broader operations require **more advanced data analysis** and decision-making tools.
- **4. Business Strategy in BI**
- Describes how an organization plans to **succeed and remain competitive**.
- **Strategy formulation depends on:**
  - **Size of the organization**
  - **Scope of activities**
  - **Market dynamics and competition**

# Business Intelligence perspectives

- **1. Organizational Perspective in BI**
- In Business Intelligence (BI), it is crucial to identify the **roles** of the parties involved in business processes.
- Understanding these roles ensures **effective process execution** and **data-driven decision-making**.
- **2. Key Roles in Business Processes:**
- **Process Owner**:
  - **Responsible for setting up the rules** and objectives of the process.
  - Ensures that the process aligns with organizational goals and strategic objectives.
- **Process Subjects**:
  - These are the **identifiers for process instances**.
  - Typically refer to specific tasks, workflows, or projects being analyzed or managed.
- **Process Actors**:
  - **Other individuals or teams** involved in executing the process.
  - Can include **employees, departments**, or any organizational units that contribute to the process's completion.

# Business Intelligence views

- **Business Process Views:**
- Business processes can be analyzed from different perspectives in BI to gain a better understanding of operations and decision-making.
- **2. Different Views of Business Processes:**
- **Event View**:
  - Focuses on **events** within the business process.
  - **Events** mark significant moments in the process, such as:
    - Start event
    - End event
    - Interruption and resuming events
- **State View**:
  - **Attributes** of the process are measured to represent the **state** at any given point in time.
  - This helps in assessing the progress and performance of a process.
- **Cross-Sectional View**:
  - Looks at the **history of multiple process instances** at a specific time.
  - It provides insight into how different instances of a process evolve or perform over time.

# Business Intelligence goals

- **Main Goal of Business Intelligence:**
- The primary objective of Business Intelligence (BI) is to provide valuable **information about business performance** and enhance the **performance of business processes**.
- **Key Aspects of BI Goals:**
- **Measurement of Performance:**
  - **Key Performance Indicators (KPIs)** are used to assess the **performance** of business processes.
  - KPIs help in understanding how well a process or organization is achieving its business goals.
- **Influential Factors:**
  - **Attributes of the process** that impact its performance.
  - These factors help identify the reasons behind certain performance levels.
- **KPIs and Business Process:**
  - KPIs are specifically designed to provide **information about the business process**.
  - By analyzing KPIs, businesses can measure success and identify areas for improvement.
- **Improving Business Processes:**
- To improve business processes, it is essential to **reformulate the relationship between KPIs and influential factors**.
- This reformulation should align with **analytical goals**, helping to pinpoint areas that require changes for better performance.

# References


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- Business Analytics by James R. Evans (Published by Pearson)

# THANKS