ATME College of Engineering

BUSINESS ANALYTICS

Course Name	
Course Code	BAD714B
Contact Hours	40
CIE Marks	50
SEE Marks	50

Course Coordinator

Mrs. MADHU NAGARAJ
Assistant Professor
Dept of CSEData Science
ATMECE, Mysuru

ATME College of Engineering

Course Learning Objectives

CLO 1. Understand the nature of data, statistical Modelling and visualization.

CLO 2. Learn concepts of Business analytics and Data Warehousing.

CLO 3. Gain knowledge on Data mining process and SNA, text & Web analytics.

Course Outcomes

CO1. Explain the role of business analytics in a dynamic business environment.
CO2. Demonstrate modern tools for Statistical Modelling and Visualization.
CO3. Illustrate analytics for Business Analytics and Data Warehousing.
CO4. Implement algorithms for data mining techniques and processes.
CO5. Develop scripts for Text & Web mining and social network analysis.

Text Book

Ramesh Sharda, Dursun Delen and Efraim Turban, "Business Intelligence, Analytics, Data Science and AI – A Managerial Perspective", 5th edition, Global Edition, Pearson Education Limited, 2024.

Reference Books

1. Steve Williams, Business Intelligence Strategy and Big Data Analytics - A General Management Perspective, Morgan Kaufmann (Elsevier), 2016. 2. Vincent Charles, Pratibha Garg, Neha Gupta and Mohini Agarwal, Data Analytics and Business Intelligence - Computational Frameworks, Practices, and Applications, CRC Press, 2023. 3. Ira J. Haimowitz, DATA ANALYTICS FOR BUSINESS - Lessons for Sales, Marketing, and Strategy, Routledge (Taylor & Francis), 2023.

Question Paper Pattern

The question paper will have ten questions.

Each full Question consisting of 20 marks.

There will be 2 full questions (with a maximum of four sub questions) from each module.

Each full question will have sub questions covering all the topics under a module.

The students will have to answer 5 full questions, selecting one full question from each module.

INTRODUCTION
Module 1- Chapt 1

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Changing Business Environments

- Business environments are rapidly evolving due to technology, globalization, and competition.
- Organizations must adapt to changes quickly to remain competitive.
- Traditional decision-making is no longer sufficient for dynamic markets.

Need for Decision Support and Analytics

- Real-time data and advanced analytics are essential.
- Decision-makers require timely, data-driven insights.
- Enhanced systems are needed to support complex decisions.

Besides the obvious growth in hardware, software, and network capacities, some developments have clearly contributed to facilitating growth of decision support and analytics in a number of ways, including the following:

1. **Group Communication & Collaboration**

- Remote teams increasingly make decisions together.
- Tools like video conferencing and smartphones ease communication.
- Cost-effective compared to assembling all members physically.
- Crucial in supply chains for real-time demand sharing and rapid response.

2. Improved Data Management

- Decisions often require complex data across locations.
- Supports multiple formats (text, audio, video) and languages.
- Modern systems ensure fast, secure, and transparent data transmission.

3. Managing Big Data

- Organizations manage vast data through data warehouses.
- Tools like Hadoop and Spark help organize and analyze data efficiently.
- Big Data allows diverse, real-time insights into performance.

4. Analytical Support

- Enhances decision-making with better forecasting and risk analysis.
- Enables quick simulations and evaluation of multiple scenarios.
- Expert insights can be gathered remotely or derived from systems.

5. Overcoming Cognitive Limits

- Human brains have limited capacity to process complex data.
- Systems support by storing, retrieving, and processing vast information.
- Helps reduce errors and expands decision-making capabilities

6. Knowledge Management

- Firms gather structured/unstructured data from various operations.
- Knowledge Management Systems (KMS) support decision-making.
- Tools like IBM Watson and text analytics extract value from data.

7. Anywhere, Anytime Access

- Wireless technologies enable real-time access and decisions on the go.
- Managers and consumers expect fast processing and response.
- Mobile tools, analytics, and social platforms empower this shift.

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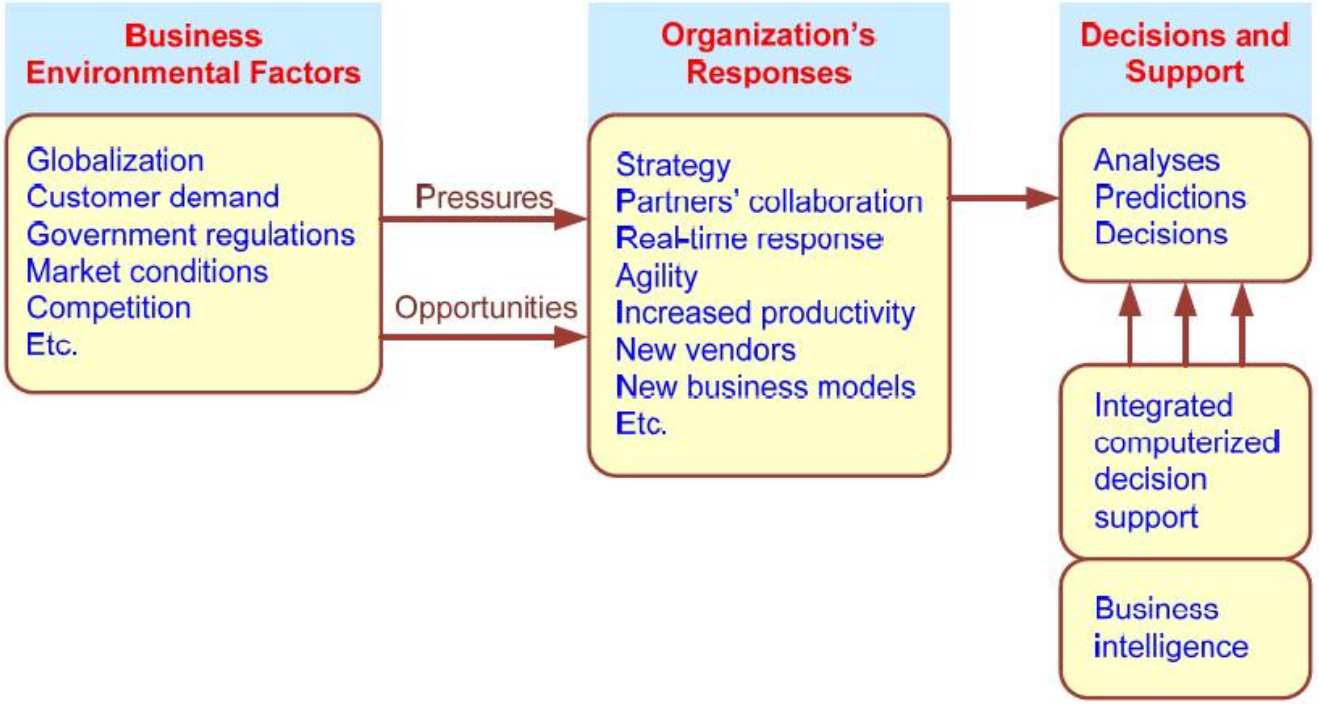
Changing Business Environment & Computerized Decision Support

- Companies are moving aggressively to computerized support of their operations ⇨ Business Intelligence
- Business Pressures–Responses–Support Model
  - Business pressures result of today's competitive business climate
  - Responses to counter the pressures
  - Support to better facilitate the process

Business Pressures–Responses–Support Model



The Business Environment

- The environment in which organizations operate today is becoming more and more complex, creating
  - opportunities, and
  - problems.
  - Example: globalization.
- Business environment factors:
  - markets, consumer demands, technology, and societal…

Organizational Responses

- Be Reactive, Anticipative, Adaptive, and Proactive
- Managers may take actions, such as
  - Employ strategic planning.
  - Use new and innovative business models.
  - Restructure business processes.
  - Participate in business alliances.
  - Improve corporate information systems.
  - … more [in the book]

Closing the Strategy Gap

- One of the major objectives of computerized decision support is to facilitate closing the gap between the current performance of an organization and its desired performance, as expressed in its mission, objectives, and goals, and the strategy to achieve them.

A Framework for Business Intelligence (BI)

- BI is an evolution of decision support concepts over time
  - Then: Executive Information System
  - Now: Everybody's Information System (BI)
- BI systems are enhanced with additional visualizations, alerts, and performance measurement capabilities
- The term BI emerged from industry

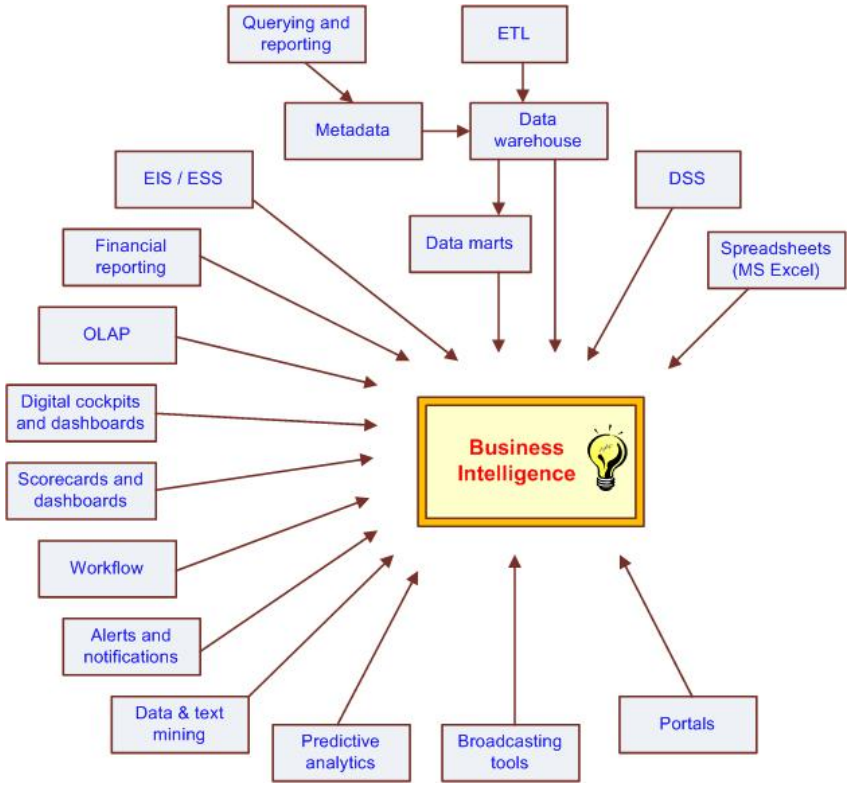
Definition of BI

- BI is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies
- BI is a content-free expression, so it means different things to different people
- BI's major objective is to enable easy access to data (and models) to provide business managers with the ability to conduct analysis
- BI helps *transform* data, to information (and knowledge), to decisions, and finally to action

A Brief History of BI

- The term BI was coined by the Gartner Group in the mid-1990s
- However, the concept is much older
  - 1970s - MIS reporting - static/periodic reports
  - 1980s - Executive Information Systems (EIS)
  - 1990s - OLAP, dynamic, multidimensional, ad-hoc reporting -> coining of the term "BI"
  - 2010s - Data/Text/Web Mining; Web-based Portals, Dashboards, Big Data, Social Media, and Visual Analytics
  - 2020s - yet to be seen

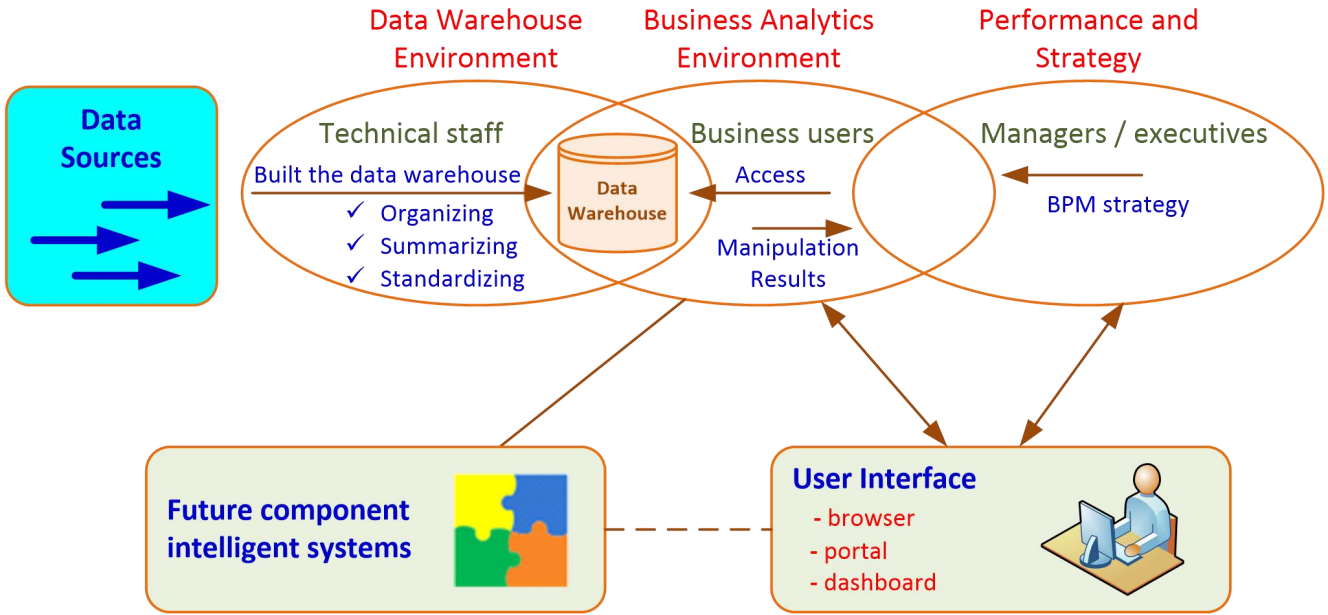
The Evolution of BI Capabilities



The Architecture of BI

- A BI system has four major components
  - a data warehouse, with its source data
  - business analytics, a collection of tools for manipulating, mining, and analyzing the data in the data warehouse
  - business performance management (BPM) for monitoring and analyzing performance
  - a user interface (e.g., dashboard)

A High-Level Architecture of BI



Components in a BI Architecture

- The data warehouse is the cornerstone of any medium-to-large BI system.
  - Originally, the data warehouse included only historical data that was organized and summarized, so end users could easily view or manipulate it.
  - Today, some data warehouses include access to current data as well, so they can provide real-time decision support (for details see Chapter 2)
- Business analytics are the tools that help the user transform data into knowledge (e.g., queries, data/text mining tools, etc.)

Components in a BI Architecture

- Business Performance Management (BPM), which is also referred to as corporate performance management (CPM), is an emerging portfolio of applications within the BI framework that provides enterprises tools they need to better manage their operations (for details see Chapter 3)
- User Interface (i.e., dashboards) provide a comprehensive graphical/pictorial view of corporate performance measures, trends, and exceptions.