An Overview of DSS, BI, DW, Analytics, and Big Data in Decision Support

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Learning Objectives

- Learn the conceptual foundations of the DSS methodology
- Describe the BI methodology and concepts and relate them to DSS
- Understand the various types of analytics
- List the major tools of computerized decision support

The Concept of DSS

- DSS - interactive computer-based systems, which help decision makers utilize data and models to solve unstructured & semi structured problems

  (Gorry and Scott-Morton, 1971)

- Decision support systems couple the intellectual resources of individuals with the capabilities of the computer to improve the quality of decisions.
- DSS –are largely 'problem-specific'

- DS as an Umbrella Term
- Evolution of DS into Business Intelligence

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

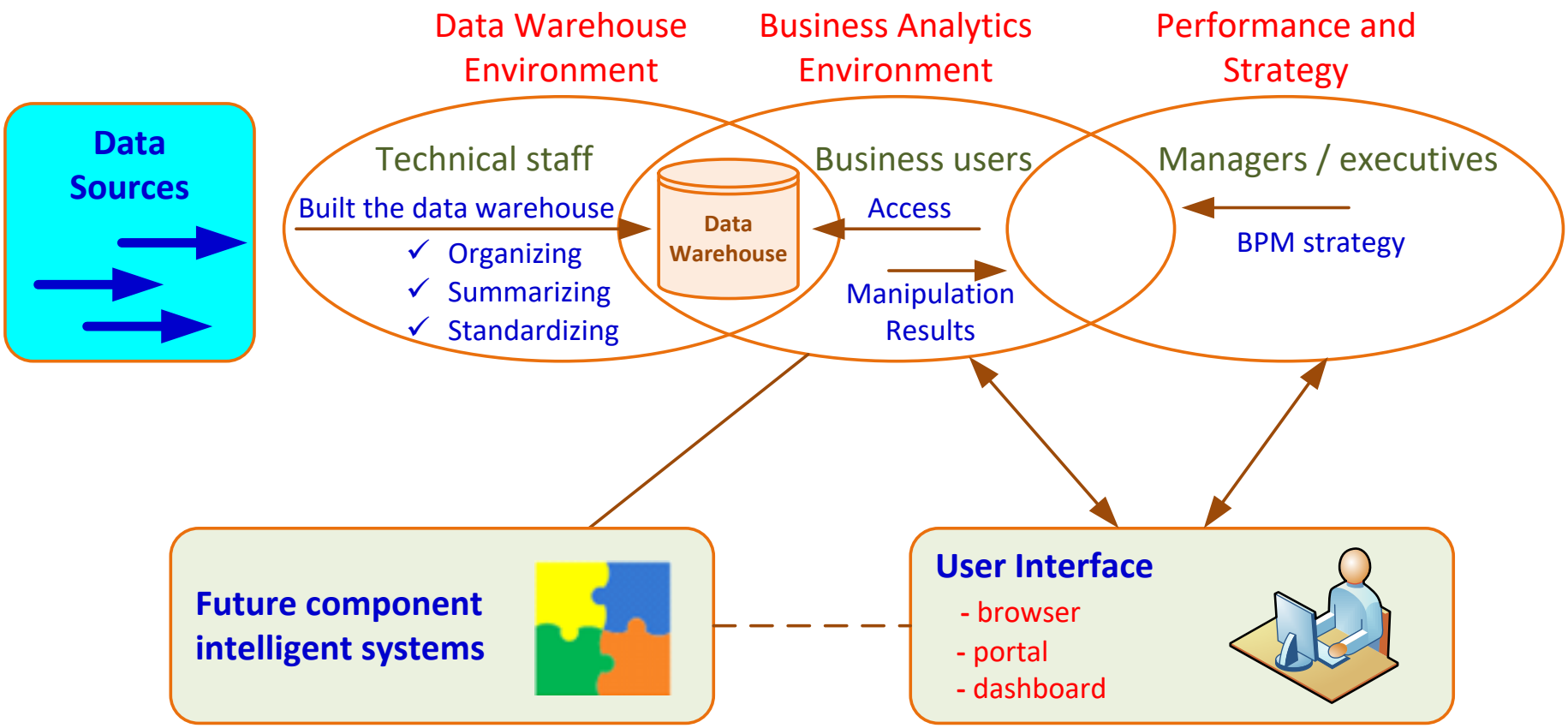
- The term BI was coined by the Gartner Group in the mid-1990s
- However, the concept is much older
  - 1970s - MIS reporting - static/periodic reports
  - 1980s - Executive Information Systems (EIS)
  - 1990s - OLAP, dynamic, multidimensional, ad-hoc reporting -> coining of the term "BI"
  - 2010s -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



Business Value of BI Analytical Applications

- Customer segmentation
- Propensity to buy
- Customer profitability
- Fraud detection
- Customer attrition
- Channel optimization

Application Case 1.1

Sabre Helps Its Clients Through Dashboards and Analytics

Questions for Discussion

1. What is traditional reporting? How is it used in the organization?
2. How can analytics be used to transform the traditional reporting?
3. How can interactive reporting assist organizations in decision making?

A Multimedia Exercise in Business Intelligence

- Teradata University Network (TUN)
  www.teradatauniversitynetwork.com

- BSI Videos (Business Scenario Investigations)
  www.youtube.com/watch?v=NXEL5F4_aKA

- Also look for other BSI Videos at TUN

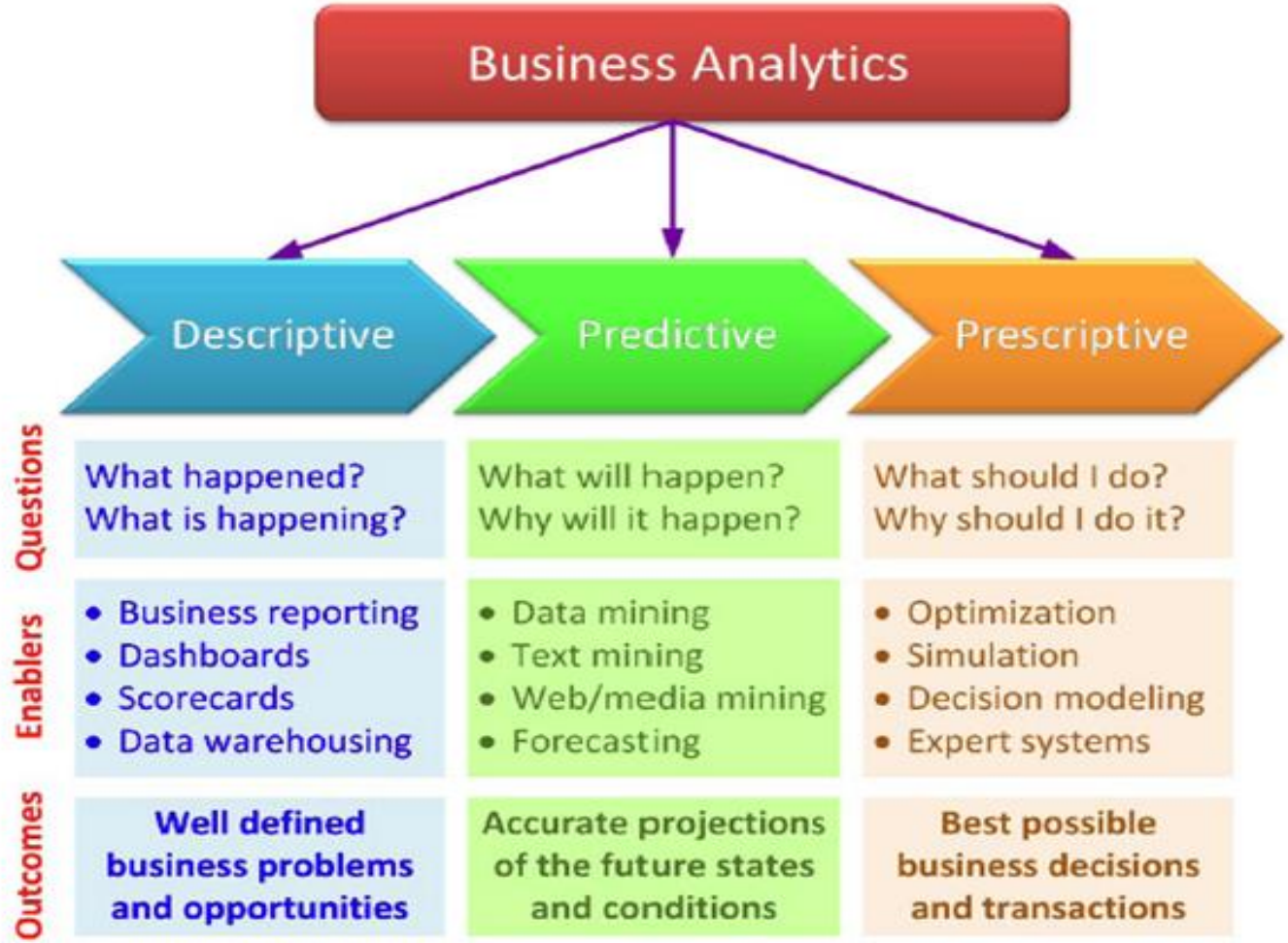
DSS-BI Connections

- Similarities and differences?
  - Similar architectures, data focus, …
- Direct vs. indirect support
- Different target audiences
- Commercially available systems versus in-house development of solutions
- Origination – Industry vs. Academia
- So, is DSS = BI ?

Analytics Overview

- Analytics?
  - Something new or just a new name for …
- A Simple Taxonomy of Analytics (proposed by INFORMS)
  - Descriptive Analytics
  - Predictive Analytics
  - Prescriptive Analytics
- Analytics or Data Science?

Analytics Overview



Also…

- **Diagnostic analytics-**
- -is a form of advanced **analytics** that examines data or content to answer the question, “Why did it happen?” It is characterized by techniques such as drill-down, data discovery, data mining and correlations.

Application Case 1.2

Eliminating Inefficiencies at Seattle Children's Hospital

Questions for Discussion

1. Who are the users of the tool?
2. What is a dashboard?
3. How does visualization help in decision making?
4. What are the significant results achieved by the use of Tableau?

Application Case 1.3

Analysis at the Speed of Thought

Questions for Discussion

1. What are the desired functionalities of a reporting tool?
2. What advantages were derived by using a reporting tool in the case?

Application Case 1.4

Moneyball: Analytics in Sports and Movies

Questions for Discussion

1. How is predictive analytics applied in *Moneyball*?
2. What is the difference between objective and subjective approaches in decision making?

Application Case 1.5

Analyzing Athletic Injuries

Questions for Discussion

1. What types of analytics are applied in the injury analysis?
2. How do visualizations aid in understanding the data and delivering insights into the data?
3. What is a classification problem?
4. What can be derived by performing sequence analysis?

Application Case 1.6

Industrial and Commercial Bank of China (ICBC) Employs Models to Reconfigure Its Branch Networks

Questions for Discussion

1. How can analytical techniques help organizations to retain competitive advantage?
2. How can descriptive and predictive analytics help in pursuing prescriptive analytics?
3. What kind of prescriptive analytic techniques are employed in the case study?
4. Are the prescriptive models once built good forever?

Introduction to Big Data Analytics

- Big Data?
  - Not just big!
  - Volume
  - Variety
  - Velocity
- More of Big Data and related analytics tools and techniques are covered in Chapter 13.

Application Case 1.7

Gilt Groupe's Flash Sales Streamlined by Big Data Analytics

Questions for Discussion

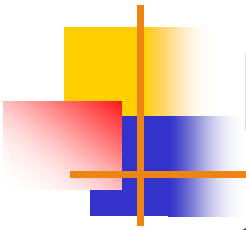
1. What makes this case study an example of Big Data analytics?
2. What types of decisions does Gilt Groupe have to make?

End-of-Chapter Application Case (-Review the case attached)

Nationwide Insurance Used BI to Enhance Customer Service

Questions for Discussion

1. Why did Nationwide need an enterprise-wide data warehouse?
2. How did integrated data drive the business value?
3. What forms of analytics are employed at Nationwide?
4. With integrated data available in an enterprise data warehouse, what other applications could Nationwide potentially develop?



End of the lecture

- Questions / Comments…???