

DECISION SUPPORT SYSTEMS

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Module Introduction

■ Pre-requisite(s):

- Data Mining & Business Analytics (INS2061),
- Enterprise Analytics for Decision Support (INS3063)

■ Assessment methods

Class participation	20%	Continuous – class attendance and tutorial participation and Labs
Mid-term quiz	20%	Two hours (2hrs) written exam
Final exam	60%	Three hours (3hrs) Project- Presentation

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Books

■ Prescribed books :

- *Decision Support and Business Intelligence Systems*, 9th Edition, Efraim Turban, Prentice Hall.

■ Recommended books :

- *Management Information Systems: Managing the Digital Firm*. 2018. 15th Edition (Laudon / Laudon), John Wiley & Sons, Inc.
- **BUSINESS INTELLIGENCE AND ANALYTICS: SYSTEMS FOR DECISION SUPPORT**, 2021. Ramesh Sharda 11th Edition

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Resources


Resources and Links

We recommend the following major resources and links:

- The Data Warehousing Institute (tdwi.org)
- Information Management (information-management.com)
- The OLAP Report (olapreport.com)
- DSS Resources (dssresources.com)
- Information Technology Toolbox (businessintelligence.ittoolbox.com)
- Business Intelligence Network (b-eye-network.com)
- AIS World (isworld.org)
- Microsoft Enterprise Consortium (enterprise.waltoncollege.uark.edu/mcc)

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Contents

	Content	
1.	Decision Support Systems and Business Intelligence Computerized Decision Support	
2.	Decision Making, Systems, Modeling and Support	
3.	Decision Support Systems Concepts, Methodologies and Technologies: an Overview	
4.	Modeling and Analysis Data Warehousing	
5.	Business Analytics and Data Visualization	
6.	Data, Text and Web Mining Neural Networks for Data Mining	
7.	Business Performance Management	
8.	Mid term exam	

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- 9. Collaborative Computing Supported Technologies and Group Support Systems
- 10. Knowledge Management
- 11. **Artificial Intelligence** and Expert Systems
- **12. Advanced Intelligent Systems (Reading)**
- **13. Intelligent Systems over the Internet (Reading)**
- **14. Systems Development and Acquisition (reading)**
- **15. Integration, Impacts and the Future of Management Support Systems(Reading)**

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OPENING VIGNETTE: How Intelligent Systems Work for KONE Elevators and Escalators Company – page 40/834

- QUESTIONS FOR THE OPENING VIGNETTE
- 1. It is said that KONE is embedding intelligence across its supply chain and enables smarter buildings. Explain.
- 2. Describe the role of IoT in this case.
- 3. What makes IBM Watson a necessity in this case?
- 4. Check IBM Advanced Analytics. What tools were included that relate to this case? 5. Check IBM cognitive buildings. How do they relate to this case?

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- WHAT CAN WE LEARN FROM THIS VIGNETTE?
- Intelligent technologies can embark on large-scale complex projects when they include AI combined with IoT.
- The capabilities of integrated intelligent platforms, such as IBM Watson, make it possible to solve problems that were economically and technologically unsolvable just a few years ago.

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- The case introduces the reader to several of the technologies, including advanced analytics, sensors, IoT, and AI that are covered in this book.
- The case also points to the use of “cloud.” The cloud is used to centrally process large amounts of information using analytics and AI algorithms, involving “things” in different locations.

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- Several AI technologies are discussed: machine learning, natural language processing, computer vision, and prescriptive analysis. The case is an example of augmented intelligence in which people and machines work together.
- The case illustrates the benefits to the vendor, the implementing companies, and their employees and to the users of the elevators and escalators.

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- **Term: augmented intelligence**
- in which people and machines work together. The case illustrates the benefits to the vendor, the implementing companies, and their employees and to the users of the elevators and escalators

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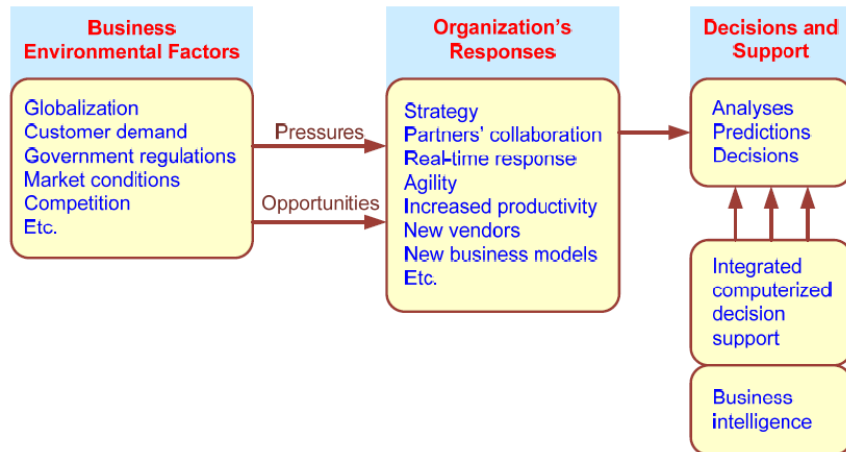
Changing Business Environment

- 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

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Business Pressures–Responses–Support Model



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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...

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Business Environment Factors

FACTOR	DESCRIPTION
Markets	Strong competition Expanding global markets Blooming electronic markets on the Internet Innovative marketing methods Opportunities for outsourcing with IT support <u>Need for real-time, on-demand transactions</u>
Consumer demand	Desire for customization Desire for quality, diversity of products, and speed of delivery <u>Customers getting powerful and less loyal</u>
Technology	More innovations, new products, and new services Increasing obsolescence rate (out of date) Increasing information overload <u>Social networking, Web 2.0 and beyond</u>
Societal	Growing government regulations and deregulation Workforce more diversified, older, and composed of more women Prime concerns of homeland security and terrorist attacks Necessity of Sarbanes-Oxley Act (US law) and other reporting-related
legislation	Increasing social responsibility of companies Greater emphasis on sustainability

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The Influence of the External and Internal Environments on the Process

<ul style="list-style-type: none"> ■ Political factors. Major decisions may be influenced by both external and internal politics. An example is the 2018 trade war on tariffs. ■ • Economic factors. These range from competition to the genera and state of the economy. These factors, both in the short and long run, need to be considered. ■ • Sociological and psychological factors regarding employees and customers. These need to be considered when changes are being made. ■ • Environment factors. The impact on the physical environment must be assessed in many decision-making situations.

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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
 - Improve partnership relationships
 - Encourage innovation and creativity ...cont...>

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Managers actions, continued

- Improve customer service and relationships
- Move to electronic commerce (e-commerce)
- Move to make-to-order production and on-demand manufacturing and services
- Use new IT to improve communication, data access (discovery of information), and collaboration
- Respond quickly to competitors' actions (e.g., in pricing, promotions, new products and services)
- Automate many tasks of white-collar employees
- Automate certain decision processes
- Improve decision making by employing analytics

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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**
- **Should** expressed in its mission, objectives, and goals, and the strategy to achieve them

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Data and Its Analysis in Decision Making

- Computer applications have moved from transaction-processing and monitoring activities to problem analysis and solution applications, and much of the activity is done with cloud-based technologies, in many cases accessed through mobile devices.
- Analytics and BI tools such as data warehousing, data mining, online analytical processing (OLAP), dashboards, and the use of cloud-based systems for decision support are the cornerstones of today's modern management. Managers must have high-speed, networked information systems (wired or wireless) to assist them with their most important task: making decisions.

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Technologies for Data Analysis and Decision Support

- Some developments have clearly contributed to facilitating the growth of decision support and analytics technologies in a number of ways:
 - Group communication and collaboration
 - Improved data management
 - Managing giant data warehouses and Big Data
 - Analytical support
 - Overcoming cognitive limits in processing and storing information
 - Knowledge management

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Managerial Decision Making

- Management is a process by which organizational goals are achieved by using resources
 - **Inputs:** resources
 - **Output:** attainment of goals
 - **Measure of success:** outputs / inputs
- Management \cong Decision Making
- Decision making: selecting the best solution from two or more alternatives

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Managerial Decision Making

- Need to be considered of decision making an art.
- What is the difference between science and art?
 - This art was purely based on creativity, judgment, intuition and experience, rather than on systematic quantitative method – that is science.

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Mintzberg's 10 Managerial Roles

Interpersonal

1. Figurehead
2. Leader
3. Liaison

Informational

4. Monitor
5. Disseminator
6. Spokesperson

Decisional

7. Entrepreneur
8. Disturbance handler
9. Resource allocator
10. Negotiator

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Decision Making Process

- Managers usually make decisions by following a four-step process (a.k.a. the scientific approach)
 1. Define the problem (or opportunity)
 2. Construct a model that describes the real-world problem
 3. Identify possible solutions to the modeled problem and evaluate the solutions
 4. Compare, choose, and recommend a potential solution to the problem

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- A more detailed process is offered by Quain (2018), who suggests the following steps:
 1. Understand the decision you have to make.
 2. Collect all the information.
 3. Identify the alternatives.
 4. Evaluate the pros and cons.
 5. Select the best alternative.
 6. Make the decision.
 7. Evaluate the impact of your decision

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Why Use Computerized DSS

- Computerized DSS can facilitate decision via:
 - Speedy computations
 - Improved communication and collaboration
 - Increased productivity of group members
 - Improved data management
 - Overcoming cognitive limits
 - Quality support; agility (quick) support
 - Using Web; anywhere, anytime support

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A Decision Support Framework

(by Gory and Scott-Morten, 1971)

Type of Decision	Type of Control		
	Operational Control	Managerial Control	Strategic Planning
Structured	Accounts receivable Accounts payable Order entry	Budget analysis Short-term forecasting Personnel reports Make-or-buy	Financial management Investment portfolio Warehouse location Distribution systems
Semistructured	Production scheduling Inventory control	Credit evaluation Budget preparation Plant layout Project scheduling Reward system design Inventory categorization	Building a new plant Mergers & acquisitions New product planning Compensation planning Quality assurance HR policies Inventory planning
Unstructured	Buying software Approving loans Operating a help desk Selecting a cover for a magazine	Negotiating Recruiting an executive Buying hardware Lobbying	R & D planning New tech. development Social responsibility planning

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▪ **Structured decisions**

- Where problem is recurring and repetitive, the common factors can be identified in order to identify a particular course of action.
- Due to which defined set of procedure can be devised for their solution. Hence, Procedures for obtaining the best solution are standardized
- Objectives are clearly defined
- Clearly specified inputs and outputs

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▪ **Un-structured decisions**

- When problems are non routine, critical and novel in nature, they require individual judgment, evaluation
- and insight varying on case-to-case basis. There is no well understood or agreed upon procedure for
- handling these problems. For such situations, predefined policy cannot be devised. However, once the
- problem has been figured out, a policy may be devised to handle the problem in future. This can make
- the problem look like as structured one giving regard to the role of individual judgment

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■ **Semi-structured Decision**

- The term is used to refer to the grey area of decisions which lie between the two extremes.
- Some (but not all) structured phases and often solved using standardized solution procedures and human judgment.
- In small organizations decisions are usually transferred from form top to bottom. In large organizations the decision are usually taken based on meeting of all departmental heads. The fact is that whether decisions are taken by single person or all in a formal meeting is not the sole determinant of a decision being structured or unstructured. Rather it simply shows the complexity of the problem

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A Decision Support Framework – cont.

- **Degree of Structuredness (Simon, 1977)**
 - Decision are classified as
 - Highly structured (a.k.a. programmed)
 - Semi-structured
 - Highly unstructured (i.e., non-programmed)
- **Types of Control (Anthony, 1965)**
 - Strategic planning (top-level, long-range)
 - Management control (tactical planning)
 - Operational control

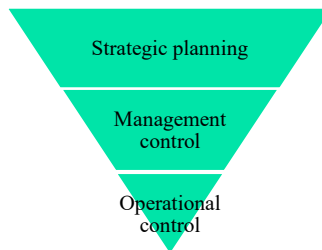
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A Decision Support Framework – cont.

Types of Control

- Strategic planning (top-level, long-range)
- Management control (middle-level tactical planning)
- Operational control (low-level)



Green area represents
the volume of the
decision making

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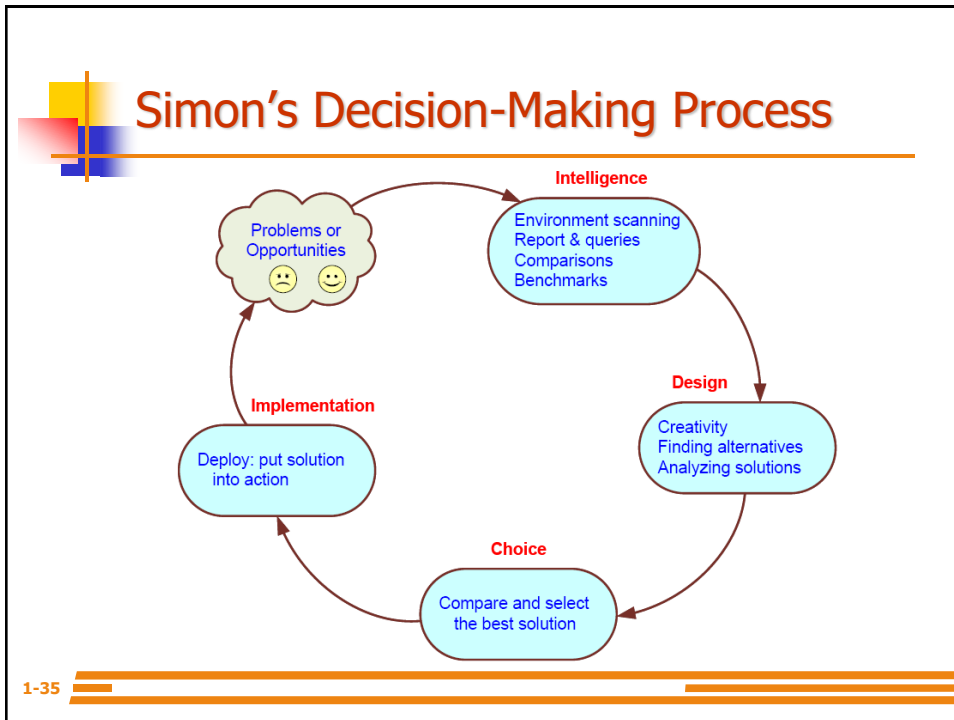
Types of Control

Strategic planning, which involves defining long range goals and policies for resource allocation

Management control, the acquisition and efficient use of resources in the accomplishment of organizational goals

Operational control, the efficient and effective execution of specific tasks

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Computer Support for Structured Decisions

- Structured problems: encountered repeatedly, have a high level of structure
- It is possible to abstract, analyze, and classify them into specific categories
 - e.g., make-or-buy decisions, capital budgeting, resource allocation, distribution, procurement, and inventory control
- For each category a solution approach is developed => Management Science

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Management Science Approach

- Also referred to as Operation Research
- In solving problems, managers should follow the five-step MS approach
 1. Define the problem
 2. Classify the problem into a standard category (*)
 3. Construct a model that describes the real-world problem
 4. Identify possible solutions to the modeled problem and evaluate the solutions
 5. Compare, choose, and recommend a potential solution to the problem

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Automated Decision Making

- A relatively new approach to supporting decision making
- Applies to highly structures decisions
- Automated decision systems (ADS) (or decision automation systems)
- An ADS is a rule-based system that provides a solution to a repetitive managerial problem in a specific area
 - e.g., simple-loan approval system

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Automated Decision Making

- ADS initially appeared in the airline industry called revenue (or yield) management (or revenue optimization) systems
 - dynamically price tickets based on actual demand
- Today, many service industries use similar pricing models
- ADS are driven by business rules!

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Computer Support for Unstructured Decisions

- Unstructured problems can be only partially supported by standard computerized quantitative methods
- They often require customized solutions
- They benefit from data and information
- Intuition and judgment may play a role
- Computerized communication and collaboration technologies along with knowledge management is often used

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Computer Support for Semi-structured Problems

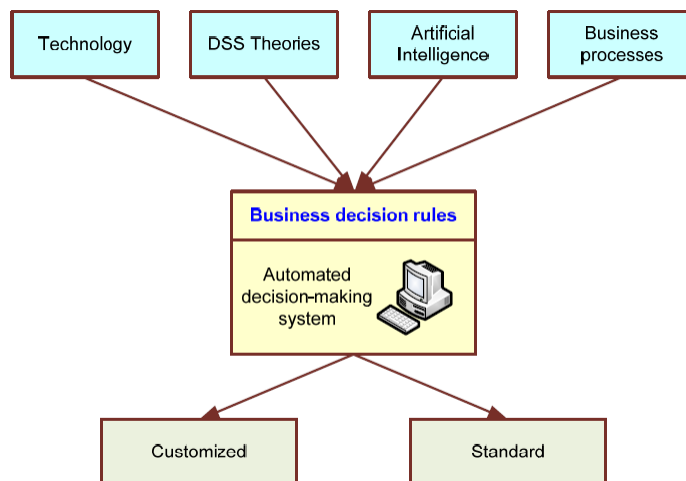
- Solving semi-structured problems may involve a combination of standard solution procedures and human judgment
- MS handles the structured parts while DSS deals with the unstructured parts
- With proper data and information, a range of alternative solutions, along with their potential impacts

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Automated Decision-Making Framework

Foundations
and Sources



Types

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APPLICATION CASE 1.1

- Company background
- Problem
- Proposed solution
- Results

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Concept of Decision Support Systems

Classical Definitions of DSS

- Interactive computer-based systems, which help decision makers utilize data and models to solve unstructured 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. It is a computer-based support system for management decision makers who deal with semistructured problems - *Keen and Scott-Morton, 1978*

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DSS as an Umbrella Term

- The term DSS can be used as an umbrella term to describe any computerized system that supports decision making in an organization
 - E.g., an organization wide knowledge management system; a decision support system specific to an organizational function (marketing, finance, accounting, manufacturing, planning, SCM, etc.)

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Application Case 1.2

- A DSS for Managing Inventory at GlaxoSmithKline

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DSS as a Specific Application

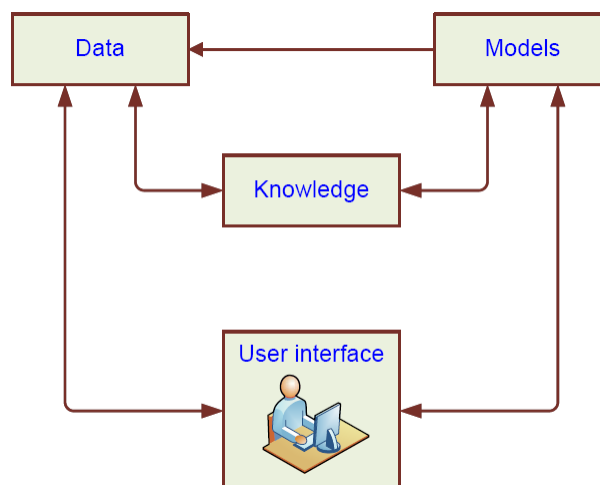
- In a narrow sense DSS refers to a process for building customized applications for unstructured or semi-structured problems
- Components of the **DSS Architecture**
 - Data, Model, Knowledge/Intelligence, User, Interface (API and/or user interface)
 - DSS often is created by putting together loosely coupled instances of these components

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High-Level Architecture of a DSS



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Types of DSS

- Two major types:
 - Model-oriented DSS
 - Data-oriented DSS
- Evolution of DSS into Business Intelligence
 - Use of DSS moved from specialist to managers, and then whomever, whenever, wherever
 - Enabling tools like OLAP, data warehousing, data mining, intelligent systems, delivered via Web technology have collectively led to the term "business intelligence" (BI) and "business analytics"

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Business Intelligence (BI)

- BI is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies
- Like DSS, BI 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

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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"
 - 2005+ Inclusion of AI and Data/Text Mining capabilities; Web-based Portals/Dashboards
 - 2010s - yet to be seen

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EVOLUTION OF COMPUTERIZED DECISION SUPPORT TO BUSINESS INTELLIGENCE/ANALYTICS/DATA SCIENCE

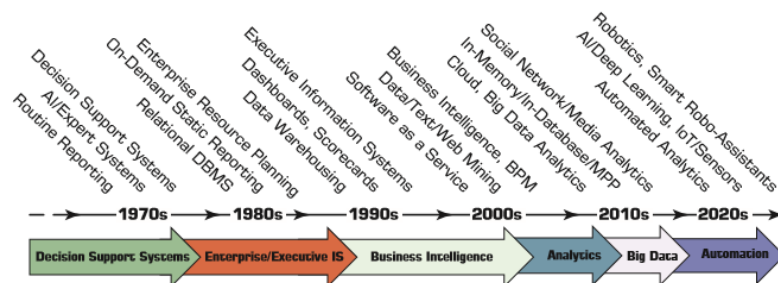


FIGURE 1.5 Evolution of Decision Support, Business Intelligence, Analytics, and AI.

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A BRIEF HISTORY OF BI

- The term BI was coined by the Gartner Group in the mid-1990s. However, as the history in the previous section points out, the concept is much older; it has its roots in the MIS reporting systems of the 1970s.
- During that period, reporting systems were static, were two dimensional, and had no analytical capabilities. In the early 1980s, the concept of EISs emerged. This concept expanded the computerized support to top-level managers and executives. Some of the capabilities introduced were dynamic multidimensional (ad hoc or on-demand) reporting, forecasting and prediction, trend analysis, drill-down to details, status access, and critical success factors. These features appeared in dozens of commercial products until the mid-1990s. Then the same capabilities and some new ones appeared under the name BI.
- Today, a good BI-based enterprise information system contains all the information that executives need. So, the original concept of EIS was transformed into BI.
- **By 2005, BI systems started to include artificial intelligence capabilities as well as powerful analytical capabilities**

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The Evolution of BI Capabilities



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The Architecture of BI

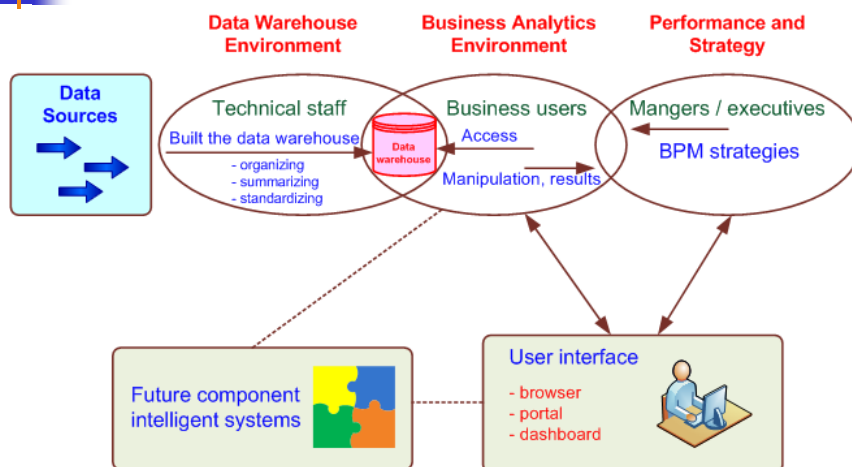
- A BI system has four major components
 - a data warehouse, with its source data
 - business analytics, a collection of tools for manipulating, mining, and analyzing the data in the data warehouse;
 - business performance management (BPM) for monitoring and analyzing performance
 - a user interface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

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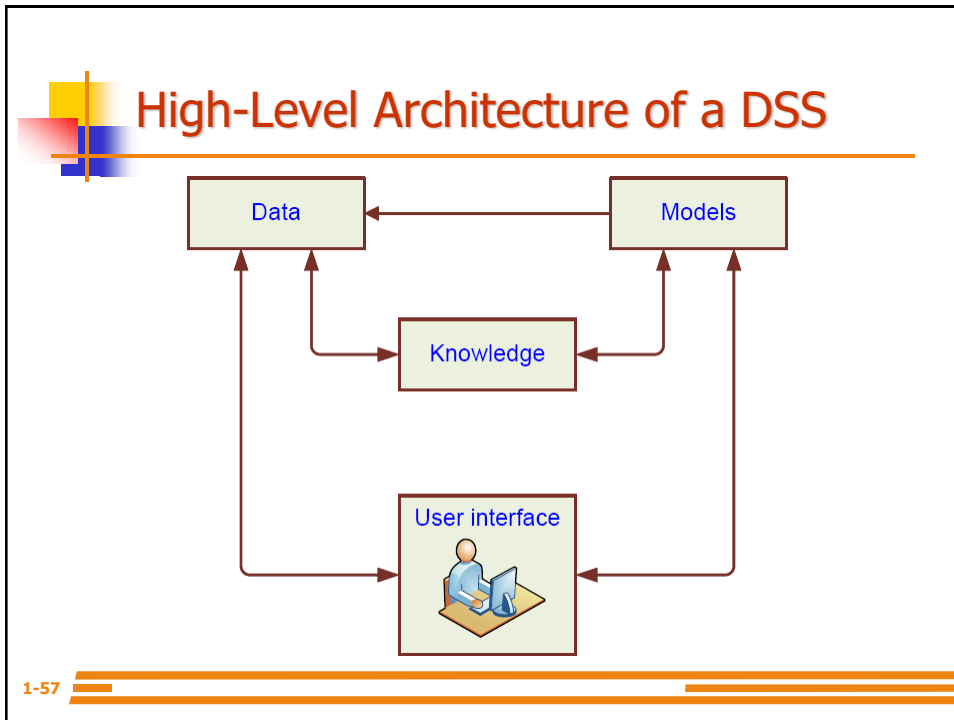


A High-Level Architecture of BI

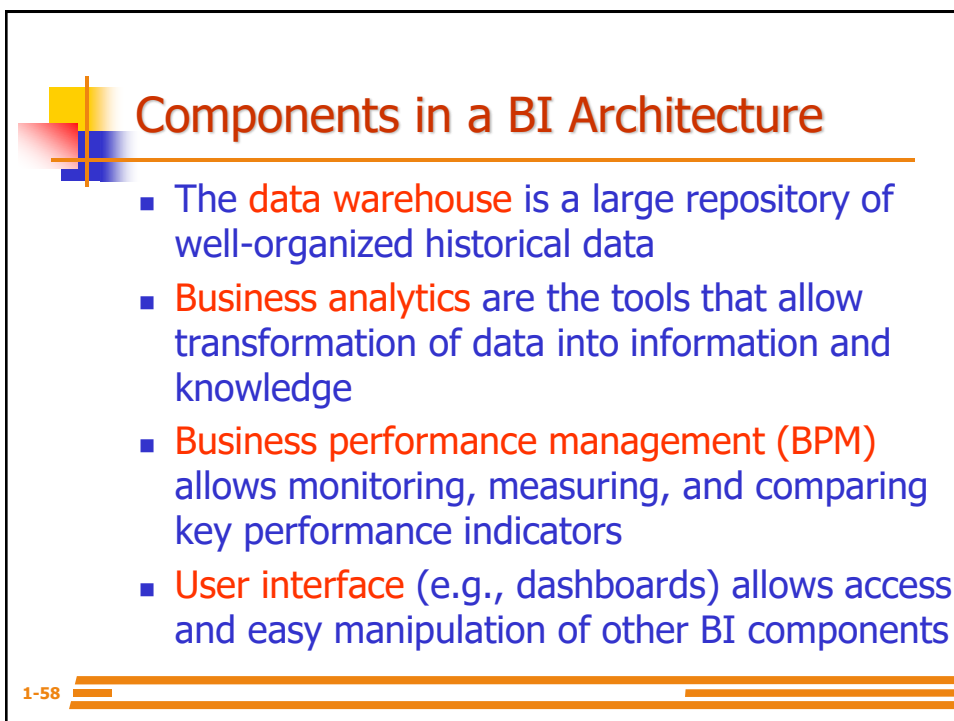


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Styles of BI

- MicroStrategy, Corp. distinguishes five styles of BI and offers tools for each
 1. report delivery and alerting
 2. enterprise reporting (using dashboards and scorecards)
 3. cube analysis (also known as slice-and-dice analysis)
 4. ad-hoc queries
 5. statistics and data mining

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The Benefits of BI

- The ability to provide accurate information when needed, including a real-time view of the corporate performance and its parts
- A survey by Thompson (2004)
 - Faster, more accurate reporting (81%)
 - Improved decision making (78%)
 - Improved customer service (56%)
 - Increased revenue (49%)
- See **Table 1.3** for a list of **BI analytic applications**, the **business questions** they answer and the **business value** they bring

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TABLE 1.3 Business Value of BI Analytical Applications

Analytic Application	Business Question	Business Value
Customer segmentation	What market segments do my customers fall into, and what are their characteristics?	Personalize customer relationships for higher satisfaction and retention.
Propensity to buy	Which customers are most likely to respond to my promotion?	Target customers based on their need to increase their loyalty to your product line. Also, increase campaign profitability by focusing on the most likely to buy.
Customer profitability	What is the lifetime profitability of my customer?	Make individual business interaction decisions based on the overall profitability of customers.
Fraud detection	How can I tell which transactions are likely to be fraudulent?	Quickly determine fraud and take immediate action to minimize cost.
Customer attrition	Which customer is at risk of leaving?	Prevent loss of high-value customers and let go of lower-value customers.
Channel optimization	What is the best channel to reach my customer in each segment?	Interact with customers based on their preference and your need to manage cost.

Source: A. Ziama and J. Kasher, Data Mining Primer for the Data Warehousing Professional, Teradata, Dayton, OH, 2004.

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The DSS–BI Connection

- First, their architectures are very similar because BI evolved from DSS
- Second, DSS directly support specific decision making, while BI provides accurate and timely information, and indirectly support decision making
- Third, BI has an executive and strategy orientation, especially in its BPM and dashboard components, while DSS, in contrast, is oriented toward analysts

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The DSS–BI Connection – cont.

- Fourth, most BI systems are constructed with commercially available tools and components, while DSS is often built from scratch
- Fifth, DSS methodologies and even some tools were developed mostly in the academic world, while BI methodologies and tools were developed mostly by software companies
- Sixth, many of the tools that BI uses are also considered DSS tools (e.g., data mining and predictive analysis are core tools in both)

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The DSS–BI Connection – cont.

- Although some people equate DSS with BI, these systems are not, at present, the same
 - some people believe that DSS is a part of BI—one of its analytical tools
 - others think that BI is a special case of DSS that deals mostly with reporting, communication, and collaboration (a form of data-oriented DSS)
 - BI is a result of a continuous revolution and, as such, DSS is one of BI's original elements
 - In this book, we separate DSS from BI
- MSS = BI and/or DSS

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A Work System View of Decision Support (Alter, 2004)

- drop the word “systems” from DSS
- focus on “decision support”
 - “use of any plausible computerized or noncomputerized means for improving decision making in a particular repetitive or nonrepetitive business situation in a particular organization”
- **Work system:** a system in which human participants and/or machines perform a business process, using information, technology, and other resources, to produce products and/or services for internal or external customers

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Elements of a Work System

1. **Business process.** Variations in the process rationale, sequence of steps, or methods used for performing particular steps
2. **Participants.** Better training, better skills, higher levels of commitment, or better real-time or delayed feedback
3. **Information.** Better information quality, information availability, or information presentation
4. **Technology.** Better data storage and retrieval, models, algorithms, statistical or graphical capabilities, or computer interaction

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Elements of a Work System – cont.

5. **Product and services.** Better ways to evaluate potential decisions
6. **Customers.** Better ways to involve customers in the decision process and to obtain greater clarity about their needs
7. **Infrastructure.** More effective use of shared infrastructure, which might lead to improvements
8. **Environment.** Better methods for incorporating concerns from the surrounding environment
9. **Strategy.** A fundamentally different operational strategy for the work system

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Major Tool Categories for MSS

TOOL CATEGORY	TOOLS AND THEIR ACRONYMS
Data management	Databases and database management system (DBMS) Extraction, transformation, and load (ETL) systems Data warehouses (DW), real-time DW, and data marts
Reporting status tracking	Online analytical processing (OLAP) Executive information systems (EIS)
Visualization	Geographical information systems (GIS) Dashboards, Information portals Multidimensional presentations
Business analytics	Optimization, Web analytics Data mining, Web mining, and text mining
Strategy and performance management	Business performance management (BPM)/ Corporate performance management (CPM) Business activity management (BAM) Dashboards and Scorecards
Communication and collaboration	Group decision support systems (GDSS) Group support systems (GSS) Collaborative information portals and systems
Social networking	Web 2.0, Expert locating systems
Knowledge management	Knowledge management systems (KMS)
Intelligent systems	Expert systems (ES) Artificial neural networks (ANN) Fuzzy logic, Genetic algorithms, Intelligent agents
Enterprise systems	Enterprise resource planning (ERP), Customer Relationship Management (CRM), and Supply-Chain Management (SCM)

Source: Table 1.4

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Hybrid (Integrated) Support Systems

- The objective of computerized decision support, regardless of its name or nature, is to assist management in solving managerial or organizational problems (and assess opportunities and strategies) faster and better than possible without computers
- Every type of tool has certain capabilities and limitations. By integrating several tools, we can improve decision support because one tool can provide advantages where another is weak
- The trend is therefore towards developing
hybrid (integrated) support system

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Hybrid (Integrated) Support Systems

- Type of integration
 - Use each tool independently to solve different aspects of the problem
 - Use several loosely integrated tools. This mainly involves transferring data from one tool to another for further processing
 - Use several tightly integrated tools. From the user's standpoint, the tool appears as a unified system
- In addition to performing different tasks in the problem-solving process, tools can support each other

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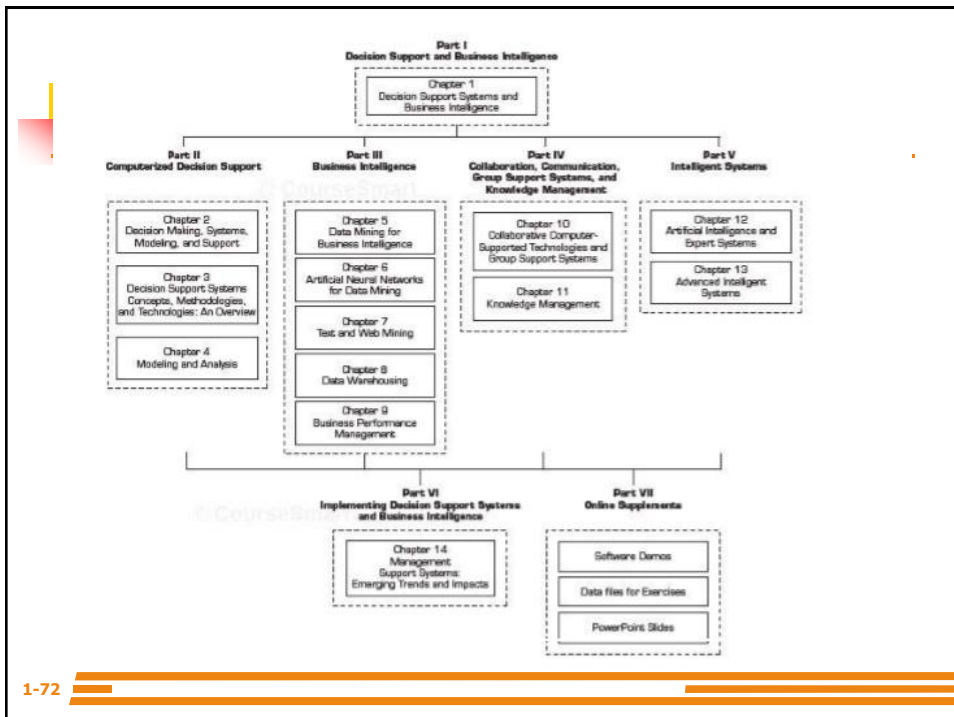
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Plan of the Book – 7 parts

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Part I: Decision Support and Business Intelligence

In Chapter 1, we have provided an introduction, definitions, and an overview of decision support systems and business intelligence.

Part II: Computerized Decision Support

Chapter 2 describes the process and methodologies of managerial decision making. Chapter 3 provides an overview of DSS and its major components. Chapter 4 describes the topic of (mathematical) modeling and analysis. It describes both structured models and modeling tools. It also describes how unstructured problems can be modeled.

Part III: Business Intelligence

BI includes several distinct components. We begin by focusing on applications and the process of data mining and analytics in Chapter 5. Chapter 6 describes some of the technical details of the algorithms of data mining, including neural networks. Chapter 7 describes the emerging application of text and Web mining. Then, in Chapter 8,

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Part IV: Collaboration, Communication, Group Support Systems, and Knowledge Management

In this part, Chapter 10 deals with the support provided to groups working either in the same room or at different locations, especially via the Web. Chapter 11 is an in-depth discussion of knowledge management (KM) systems, which are enterprise-level support systems that manage the knowledge needed for decision support.

Part V: Intelligent Systems

The fundamentals of artificial intelligence and ES are the subject of Chapter 12. Advanced intelligent systems, including genetic algorithms, fuzzy logic, and hybrids, are the subject of Chapter 13. Chapter 14 attempts to integrate all the material covered here and concludes with a discussion of emerging trends, such as how the ubiquity of cell phones, GPS devices, and wireless PDAs is resulting in the creation of massive new databases. A new breed of data mining and BI companies is emerging to analyze these new databases and create a much better and deeper understanding of customers'

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- Data Warehousing Supports Corporate Strategy at First American Corporation
- (by Watson, Wixom, and Goodhue). Read the paper and answer the following questions:
- a. What were the drivers for the DW /BI project in the company?
- b. What strategic advantages were realized?
- c. What operational and tactical advantages were achieved?
- d. What were the critical success factors (CSF) for the implementation?

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Chapter Highlight

- The business environment is becoming more complex and is rapidly changing → making decision making more difficult
- Business must respond and adapt to the change (faster and better decision)
- The time frame for making decision is shrinking, global nature of decision making is expanding → need using DSS.
- The rate of computerization is increasing rapidly → use managerial decision support

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- MSS are technologies designed to support managerial work. They can be used independently or in combination.
- Computerized support for managers is often essential for the survival of an organization.
- An early decision support framework divides decision situations into nine categories, depending on the degree of structuredness and managerial activities. Each category is supported differently.
- Structured repetitive decisions are supported by standard quantitative analysis methods, such as MS, MIS, and rule-based automated decision support.
- DSS use data, models, and sometimes knowledge management to find solutions for semistructured and some unstructured problems.
- Automated decision support is provided today in many industries to find solutions to repetitive decisions (such as item pricing) based on business rules.
- BI methods utilize a central repository called a data warehouse that enables efficient data mining, OLAP, BPM, and data visualization.
- BI architecture includes a data warehouse, business analytics tools used by end users, and a user interface (such as a dashboard).
- Many organizations use BPM systems to monitor performance, compare it to standards and goals, and show it graphically (e.g., using dashboards) to managers and executives.
- Data mining is a tool for discovering information and relationships in a large amount of data.
- All MSS technologies are interactive and can be integrated together and with other computer-based information systems (CBIS) into hybrid support systems.
- Web technology and the Internet, intranets, and extranets play a key role in the development, dissemination, and use of MSS.
- The work system is a new concept in decision support that broadens the field to include non-computerized methods combined with computerized ones.

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Discussions

Questions for Discussion


1. Give examples for the content of each cell in Figure 1.2.
2. Survey the literature from the past 6 months to find one application each for DSS, BI, and intelligent systems. Summarize the applications on one page and submit it with the exact sources.
3. Observe an organization with which you are familiar. List three decisions it makes in each of the following categories: strategic planning, management control (tactical planning), and operational planning and control.
4. Compare and contrast MS with ADS.
5. Which organizational responses can be considered reactive and which can be considered proactive?
6. Discuss how a wireless system can improve decision making.
7. Discuss the importance of ADS.
8. Distinguish BI from DSS.

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Type of Decision	Type of Control		
	Operational Control	Managerial Control	Strategic Planning
Structured	1 Accounts receivable Accounts payable Order entry	2 Budget analysis Short-term forecasting Personnel reports Make-or-buy	3 Financial management Investment portfolio Warehouse location Distribution systems
Semistructured	4 Production scheduling Inventory control	5 Credit evaluation Budget preparation Plant layout Project scheduling Reward system design Inventory categorization	6 Building a new plant Mergers & acquisitions New product planning Compensation planning Quality assurance HR policies Inventory planning
Unstructured	7 Buying software Approving loans Operating a help desk Selecting a cover for a magazine	8 Negotiating Recruiting an executive Buying hardware Lobbying	9 R & D planning New tech development Social responsibility planning

FIGURE 1.2 Decision Support Frameworks




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Suggestions

- <https://www.capterra.com/decision-support-software/>
- <https://www.getapp.com/operations-management-software/decision-support/>
- <http://fintechlabs.in/credit-rating/>



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End-of-Chapter Application Case – page 65

- 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?

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What We Can Learn from This Application Case

- The proper use of integrated information in organizations can help achieve better business outcomes. Many organizations now rely on data warehousing technologies to perform the online analytical processes on the data to derive valuable insights. The insights are used to develop predictive models that further enable the growth of the organizations by more precisely assessing customer needs. Increasingly, organizations are moving toward deriving value from analytical applications in real time with the help of integrated data from real-time data warehousing technologies.

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- https://saylordotorg.github.io/text_how-to-use-microsoft-excel-v1.1/s05-05-chapter-assignments-and-tests.html