

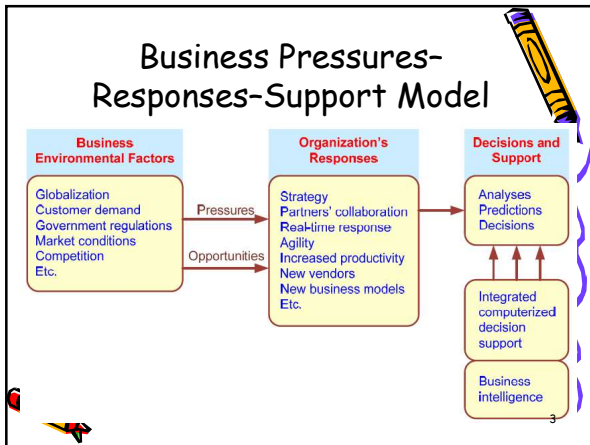
An Overview of Decision Support Systems

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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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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 Need for real-time, on-demand transactions
Consumer demand	Desire for customization Desire for quality, diversity of products, and speed of delivery Customers getting powerful and less loyal
Technology	More innovations, new products, and new services Increasing obsolescence rate Increasing information overload Social networking, Web 2.0 and beyond
Societal	Growing government regulations and deregulation Workforce more diversified, older, and composed of more women concerns of homeland security and terrorist attacks Necessity of Sarbanes-Oxley Act and other reporting-related legislation Increasing social responsibility of companies Greater emphasis on sustainability

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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, continue

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

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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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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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Phases of Decision Making

Intelligence Phase

Design Phase

Choice Phase

Implementation Phase

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Intelligence Phase

- Decision maker examines the organization's environment for conditions that need decisions
- Data is collected from a variety of sources and processed
 - Allows decision maker to discover ways to approach the problem

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Design Phase

- Defines criteria for the decision
- Generates alternatives for meeting the criteria
- Defines associations between the criteria and the alternatives
 - Requires understanding how each alternative affects the criteria
- Information technology does not support this phase of decision making

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Choice Phase

- Involves selecting best and most effective course of action is from the alternatives
- Analyzes each alternative and its relationship to the criteria to determine whether it is feasible
- Decision support system (DSS)
 - Helps sort through possible solutions to choose the best one for the organization
 - Includes tools for calculating cost-benefit ratios

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Implementation Phase

- Organization devises a plan for carrying out the alternative selected in the choice phase and obtains the resources to implement the plan
- DSS does a follow-up assessment on how well a solution is performing

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Types of Decisions in an Organization

- **Structured decisions**
 - Can be automated because a well-defined standard operating procedure exists for these types of decisions
 - Known as programmable tasks
- **Semistructured decisions**
 - Include a structured aspect that benefits from information retrieval, analytical models, and information systems technology

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Types of Decisions in an Organization

- **Unstructured decisions**
 - One-time decisions with no standard operating procedure
 - Decision maker's intuition plays a important role as information technology offers less support for the decisions
- **Challenges in semistructured and unstructured decisions**
 - Involve multiple criteria
 - Users have to choose between conflicting objectives

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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 support
 - Using Web; anywhere, anytime support

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Concept of Decision Support Systems

Definitions of DSS

- Interactive computer-based systems, which help decision makers utilize data and models to solve unstructured problems" - Gorry and Scott-Morton, 1971

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Definitions of DSS

- 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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Decision Support Systems (DSS)

- Interactive information system designed to assist decision makers in an organization
- Consists of:
 - Hardware
 - Software
 - Data
 - Mathematical and statistical models

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Decision Support Systems (DSS)

- Requirements
 - Be interactive and incorporate the human element as well as hardware and software
 - Use internal and external data
 - Include mathematical and statistical models
 - Support decision makers at all organizational levels
 - Emphasize semistructured and unstructured tasks

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Components of a Decision Support System

- **Database**
 - Includes internal and external data, and a database management system (DBMS)
 - Enables a DSS to perform data analysis operations
- **Model base**
 - Includes mathematical and statistical models that enable a DSS to analyze information

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Components of a Decision Support System

- Users access the DSS through user interface
- DSS engine manages and coordinates the major components

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