Chapter 10

Improving Decision Making and Managing Knowledge
STUDENT OBJECTIVES

• Compare different types of decisions and describe the decision-making process.

• Evaluate the role of information systems in helping people working individually and in groups make decisions more effectively.

• Evaluate the business benefits of using intelligent techniques in decision making and knowledge management.
STUDENT OBJECTIVES

• Define and describe the types of systems used for enterprise-wide knowledge management and demonstrate how they provide value for businesses.

• Define and describe the major types of knowledge work systems and demonstrate how they provide value for firms.
• **Problem:** Cost pressures, complex supply chain.

• **Solutions:** Deploy modeling and optimization software to maximize return on investment and predict the most successful supply chain.

• **Modeling software fueled with data from Oracle data warehouse** improved efficiency and reduced costs.

• **Demonstrates IT’s role in restructuring a supply chain.**

• **Illustrates digital technology improving decision making through information systems.**
Business Value of Improved Decision Making

- Measuring the value of improved decision making
- Identifying key decisions that may benefit from new system investments that could improve decision making
- Decisions may be common, routine, and numerous
- Value of improving multitudes of small decisions that may not provide much value as single decisions
Types of Decisions

- Unstructured
- Structured
- Semi-structured
Senior managers, middle managers, operational managers, and employees have different types of decisions and information requirements.

Figure 10-1

**Decision Characteristics**

- **Unstructured**
  - Senior Management
    - Decide entrance or exit from markets
    - Approve capital budget
    - Decide long-term goals

- **Semistructured**
  - Middle Management
    - Design a marketing plan
    - Develop a departmental budget
    - Design a new corporate Web site

- **Structured**
  - Operational Management
    - Individual Employees and Teams
    - Determine overtime eligibility
    - Restock inventory
    - Offer credit to customers
    - Determine special offers to customers
The Decision-Making Process

- Intelligence
- Design
- Choice
- Implementation
Stages in Decision Making

Problem discovery: What is the problem?

Solution discovery: What are the possible solutions?

Choosing solutions: What is the best solution?

Solution testing: Is the solution working? Can we make it work better?

Implementation

Design

Choice

Intelligence

The decision-making process can be broken down into four stages.

Figure 10-2
Quality of Decisions and Decision Making

• Accuracy
• Comprehensiveness
• Fairness
• Speed (efficiency)
• Coherence
• Due process
Systems and Technologies for Supporting Decisions

- Management information systems (MIS)
- Decision-support systems (DSS)
- Executive support systems (ESS)
- Group-decision support systems (GDSS)
- Intelligent techniques
Management Information Systems (MIS)

• Help managers monitor and control a business
• Produce regular reports on performance, such as monthly or annual sales
• Sometimes highlight exceptional conditions
• Reports often available online
Decision-Support Systems (DSS)

- Support semi-structured and unstructured problem analysis
- Model-driven
  - “What-if” analysis
- Data-driven
  - Online analytical processing (OLAP)
Components of DSS

• DSS database
• DSS software system
• Models
• Sensitivity analysis
• DSS user interface
Examples of DSS

• Burlington Coat Factory: DSS for pricing decisions
• Parkway Corporation: DSS for asset utilization
• Compass Bank: DSS for customer relationship management
Data Visualization and Geographic Information Systems (GIS)

- Data visualization tools present data in graphical form to help users see patterns and relationships in large quantities of data.
- Geographic information systems (GIS) use data visualization technology to analyze and display data in the form of digitized maps.
- GIS support decisions that require knowledge about the geographic distribution of people or other resources.
Bermuda’s High-Tech Rat Trap

• Read the Focus on Technology and then discuss the following questions:
  • What was the problem facing the island of Bermuda?
  • What was the business impact of the problem?
  • How did the GIS solve the problem?
  • Was it a good solution?
  • Describe the technology involved in the solution.
  • Do you think there was room for improvement on any aspect of the solution? What else might have been done?
Interactive Session: GIS

- What other kinds of problems can you think of that could be solved using geographic information systems?
- How would GIS technology provide a solution in your example?
- Are there any disadvantages or negative consequences of GIS technology? What are they?
Web-Based Customer Decision-Support Systems (CDSS)

- Interactivity and personalization
- Intensity of information
- Customer decision-support systems assist customers in the decision-making process
- Search engines, intelligent agents, online catalogs, Web directories, newsgroups, e-mail, etc.
Executive Support Systems (ESS)

- Give senior executives a picture of the overall performance of an organization
- Enable an executive to zoom in on details or zoom out for a broader view
- Drill down capability
- Digital dashboard
Group Decision-Support Systems (GDSS)

- Interactive, computer-based systems that facilitates solving of unstructured problems by a set of decision makers
- Used in conference rooms with special hardware and software
- Support increased meeting sizes with increased productivity
• Artificial intelligence (AI)
• Expert systems
  • Knowledge base
  • Inference engine
  • Knowledge engineer
• Case-based reasoning
• Fuzzy logic systems
• Neural networks
• Genetic algorithms
• Intelligent agents
Intelligent Agents in P&G’s Supply Chain Network

1. Software agents schedule deliveries from suppliers. If a supplier can’t deliver on time, agents negotiate with other suppliers to create an alternative delivery schedule.

2. Software agents collect real-time sales data on each P&G product from multiple retail stores. They relay the data to P&G production for replenishing orders and to sales and marketing for trend analysis.

3. Software agents schedule shipments from distributors to retailers, giving priority to retailers whose inventories are low. If a shipment to a retailer is delayed, agents find an alternative trucker.

Intelligent agents are helping Procter & Gamble shorten the replenishment cycles for products, such as a box of Tide.

Figure 10-11
Knowledge management: business processes developed for creating, storing, transferring, and applying knowledge

**Enterprise-Wide Knowledge Management Systems**

- Structured knowledge systems
- Semi-structured knowledge systems
- Knowledge network systems
- Portals, collaboration tools, and learning management systems
Knowledge Work Systems (KWS)

- Requirements of knowledge work systems
- Examples of knowledge work systems
  - Computer-aided design (CAD) systems
  - Virtual reality systems
  - Virtual Reality Modeling Language (VRML)
  - Investment workstations