

Chapter 12

What to Sell? What Price to Charge? Ask the Data

- ❖ **Problem:** Chain retailers such as Starbucks, Duane Reade, need to determine what products will sell at what prices at different locations
- ❖ **Solutions:** Business analytics software to analyze patterns in sales data, create pricing profiles and buyer profiles for different regions, locales, even times of day
- ❖ Demonstrates the use of business intelligence and analysis systems to improve sales and profits
- ❖ Illustrates how information systems improve decision making

Decision Making and Information Systems

- ❖ **Business value of improved decision making**
 - Improving hundreds of thousands of “small” decisions adds up to large annual value for the business
- ❖ **Types of decisions:**
 - **Unstructured:** Decision maker must provide judgment, evaluation, and insight to solve problem
 - **Structured:** Repetitive and routine; involve definite procedure for handling so they do not have to be treated each time as new
 - **Semistructured:** Only part of problem has clear-cut answer provided by accepted procedure
- ❖ **Senior managers:**
 - Make many unstructured decisions.
 - E.g. Should we enter a new market?
- ❖ **Middle managers:**
 - Make more structured decisions but these may include unstructured components
 - E.g. Why is order fulfillment report showing decline in Minneapolis?
- ❖ **Operational managers, rank and file employees**
 - Make more structured decisions.
 - E.g. Does customer meet criteria for credit?

INFORMATION REQUIREMENTS OF KEY DECISION-MAKING GROUPS IN A FIRM

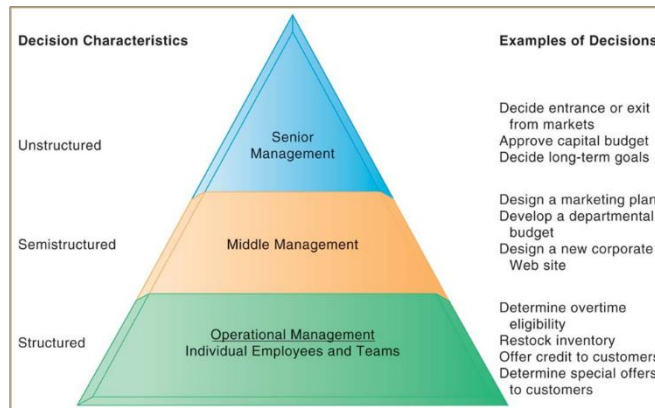


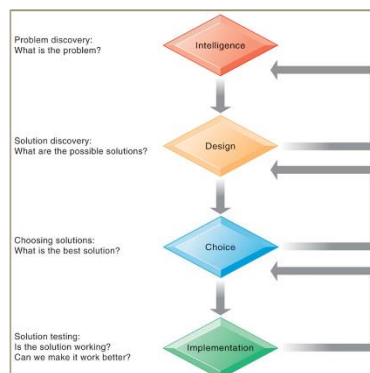
FIGURE 12-1 Senior managers, middle managers, operational managers, and employees have different types of decisions and information requirements.

- ❖ **The 4 stages of the decision making process**
 - **Intelligence**
 - Discovering, identifying, and understanding the problems occurring in the organization
 - **Design**
 - Identifying and exploring solutions to the problem
 - **Choice**
 - Choosing among solution alternatives
 - **Implementation**
 - Making chosen alternative work and continuing to monitor how well solution is working

STAGES IN DECISION MAKING

The decision-making process is broken down into four stages.

FIGURE 12-2





- ✧ **Information systems can only assist in some of the roles played by managers**
- ✧ **Classical model of management: 5 functions**
 - **Planning, organizing, coordinating, deciding, and controlling**
- ✧ **More contemporary behavioral models**
 - **Actual behavior of managers appears to be less systematic, more informal, less reflective, more reactive, and less well organized than in classical model**

- **Mintzberg's 10 managerial roles**

- **Interpersonal roles**
 1. Figurehead
 2. Leader
 3. Liaison
- **Informational roles**
 4. Nerve center
 5. Disseminator
 6. Spokesperson
- **Decisional roles**
 7. Entrepreneur
 8. Disturbance handler
 9. Resource allocator
 10. Negotiator

- **Three main reasons why investments in information technology do not always produce positive results**

1. **Information quality**
 - High-quality decisions require high-quality information.
2. **Management filters**
 - Managers have selective attention and have variety of biases that reject information that does not conform to prior conceptions
3. **Organizational inertia and politics**
 - Strong forces within organizations resist making decisions calling for major change

- **High velocity automated decision making**

- **Made possible through computer algorithms precisely defining steps for a highly structured decision**
- **Humans taken out of decision.**
- **E.g. High-speed computer trading programs**
 - Trades executed in 30 milliseconds.
 - Responsible for “Flash Crash” of 2010
- **Require safeguards to ensure proper operation and regulation**

Business Intelligence in the Enterprise

- ✧ **Business intelligence**

- **Infrastructure for collecting, storing, analyzing data produced by business**
- **Databases, data warehouses, data marts**

- ✧ **Business analytics**

- **Tools and techniques for analyzing data**
- **OLAP, statistics, models, data mining**

- ✧ **Business intelligence vendors**

- **Create business intelligence and analytics purchased by firms**

- ✧ **Six elements in the business intelligence environment**

1. **Data from the business environment**
2. **Business intelligence infrastructure**
3. **Business analytics toolset**
4. **Managerial users and methods**
5. **Delivery platform – MIS, DSS, ESS**
6. **User interface**



BUSINESS INTELLIGENCE AND ANALYTICS FOR DECISION SUPPORT

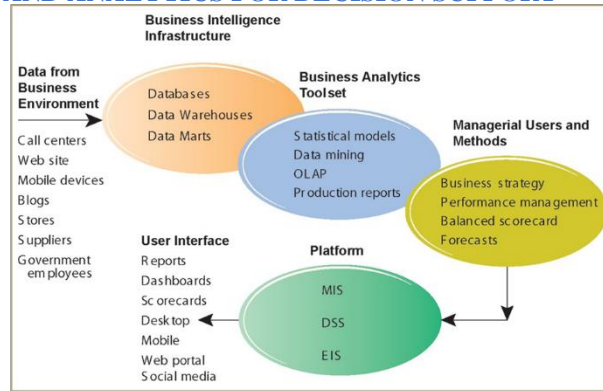


FIGURE 12-3 Business intelligence and analytics requires a strong database foundation, a set of analytic tools, and an involved management team that can ask intelligent questions and analyze data.

Business intelligence and analytics capabilities

- **Goal is to deliver accurate real-time information to decision-makers**
- **Main functionalities of BI systems**
 1. Production reports
 2. Parameterized reports
 3. Dashboards/scorecards
 4. Ad hoc query/search/report creation
 5. Drill down
 6. Forecasts, scenarios, models

Business intelligence users

- **80% are casual users relying on production reports.**
- **Senior executives**
 - Use monitoring functionalities.
- **Middle managers and analysts**
 - Ad-hoc analysis
- **Operational employees**
 - Prepackaged reports
 - E.g. sales forecasts, customer satisfaction, loyalty and attrition, supply chain backlog, employee productivity

BUSINESS INTELLIGENCE USERS

Power Users: Producers (20% of employees)	Capabilities	Casual Users: Consumers (80% of employees)
IT developers	Production Reports	Customers/Suppliers Operational employees
Super users	Parameterized Reports	
Business analysts	Dashboards/Scorecards	Senior managers
Analytical modelers	Ad hoc queries; Drill down Search/OLAP	Managers/Staff
	Forecasts; What if Analysis; statistical models	Business analysts

FIGURE 12-4 Casual users are consumers of BI output, while intense power users are the producers of reports, new analyses, models, and forecasts.

Examples of BI applications

- **Predictive analytics**
 - Use patterns in data to predict future behavior
 - E.g. Credit card companies use predictive analytics to determine customers at risk for leaving
- **Data visualization**
 - Help users see patterns and relationships that would be difficult to see in text lists
- **Geographic information systems (GIS)**
 - Ties location-related data to maps



Management strategies for developing BI and BA capabilities.

- **Two main strategies**
 - One-stop integrated solution.
 - Hardware firms sell software that run optimally on their hardware.
 - Makes firm dependent on single vendor – switching costs.
 - Multiple best-of-breed solution
 - Greater flexibility and independence
 - Potential difficulties in integration
 - Must deal with multiple vendors

DATA-DRIVEN SCHOOLS

Read the Interactive Session and discuss the following questions

- Identify and describe the problem discussed in the case.
- How do business intelligence systems provide a solution to this problem? What are the inputs and outputs of these systems?
- What management, organization, and technology issues must be addressed by this solution?
- How successful is this solution? Explain your answer.
- Should all school districts use such a data-driven approach to education? Why or why not?

Business Intelligence Constituencies

- **Operational and middle managers**
 - Monitor day to day business performance
 - Make fairly structured decisions
 - Use MIS
- **“Super user” and business analysts**
 - Use more sophisticated analysis
 - Create customized reports
 - Use DSS
- **Decision support systems**
 - Use mathematical or analytical models
 - Allow varied types of analysis
 - “What-if” analysis
 - Sensitivity analysis
 - Backward sensitivity analysis
 - Multidimensional analysis / OLAP
 - E. g. pivot tables

SENSITIVITY ANALYSIS

Total fixed costs	19000					
Variable cost per unit	3					
Average sales price	17					
Contribution margin	14					
Break-even point	1357					
Variable Cost per Unit						
Sales	1357	2	3	4	5	6
Price	14	1583	1727	1900	2111	2375
	15	1462	1583	1727	1900	2111
	16	1357	1462	1583	1727	1900
	17	1267	1357	1462	1583	1727
	18	1188	1267	1357	1462	1583

FIGURE 12-5

This table displays the results of a sensitivity analysis of the effect of changing the sales price of a necktie and the cost per unit on the product's break-even point. It answers the question, "What happens to the break-even point if the sales price and the cost to make each unit increases or decreases?"

A PIVOT TABLE THAT EXAMINES CUSTOMER REGIONAL DISTRIBUTION AND ADVERTISING SOURCE

In this pivot table, we are able to examine where an online training company's customers come from in terms of region and advertising source.

FIGURE 12-6

Region	Source	Count of Cust ID
East	Web	24
East	Payroll	77
East	Email	101
North	Web	28
North	Payroll	64
North	Email	92
South	Web	23
South	Payroll	73
South	Email	106
West	Web	67
West	Payroll	154
West	Email	211
Grand Total		142
		368
		510



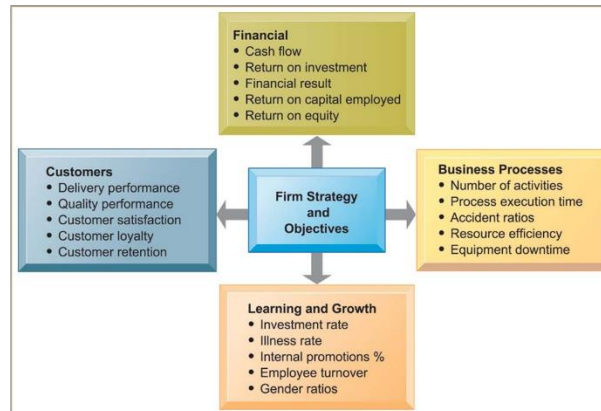
Decision-support for senior management

- **Help executives focus on important performance information**
- **Balanced scorecard method:**
 - Measures outcomes on four dimensions:
 1. Financial
 2. Business process
 3. Customer
 4. Learning & growth
 - Key performance indicators (KPIs) measure each dimension

THE BALANCED SCORECARD FRAMEWORK

In the balanced scorecard framework, the firm's strategic objectives are operationalized along four dimensions: financial, business process, customer, and learning and growth. Each dimension is measured using several KPIs.

FIGURE 12-7



Decision-support for senior management (cont.)

- **Business performance management (BPM)**
 - Translates firm's strategies (e.g. differentiation, low- cost producer, scope of operation) into operational targets
 - KPIs developed to measure progress towards targets
- **Data for ESS**
 - Internal data from enterprise applications
 - External data such as financial market databases
 - Drill-down capabilities

PILOTING VALERO WITH REAL-TIME MANAGEMENT

Read the Interactive Session and discuss the following questions

- What management, organization, and technology issues had to be addressed when developing Valero's dashboard?
- What measures of performance do the dashboards display? Give examples of several management decisions that would benefit from the information provided by Valero's dashboards.
- What kinds of information systems are required by Valero to maintain and operate its refining dashboard?
- How effective are Valero's dashboards in helping management pilot the company? Explain your answer.
- Should Valero develop a dashboard to measure the many factors in its environment that it does not control? Why or why not?

Group Decision Support Systems (GDSS)

- **Interactive system to facilitate solution of unstructured problems by group**
- **Specialized hardware and software; typically used in conference rooms**
 - Overhead projectors, display screens
 - Software to collect, rank, edit participant ideas and responses
 - May require facilitator and staff
- **Enables increasing meeting size and increasing productivity**
- **Promotes collaborative atmosphere, guaranteeing anonymity**
- **Uses structured methods to organize and evaluate ideas**