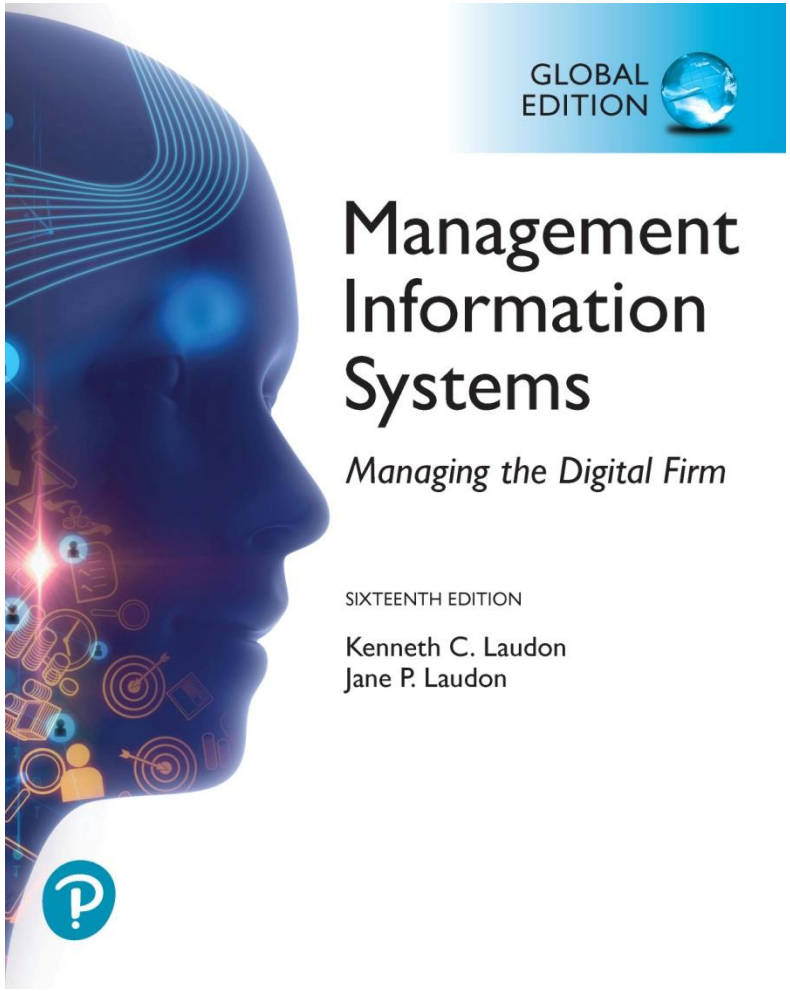
Management Information Systems: Managing the Digital Firm

Sixteenth Edition • Global Edition



Chapter 12

Enhancing Decision Making

Learning Objectives

12.1 What are the different types of decisions, and how does the decision making process work?

12.2 How do information systems support the activities of managers and management decision making?

12.3 How do business intelligence and business analytics support decision making?

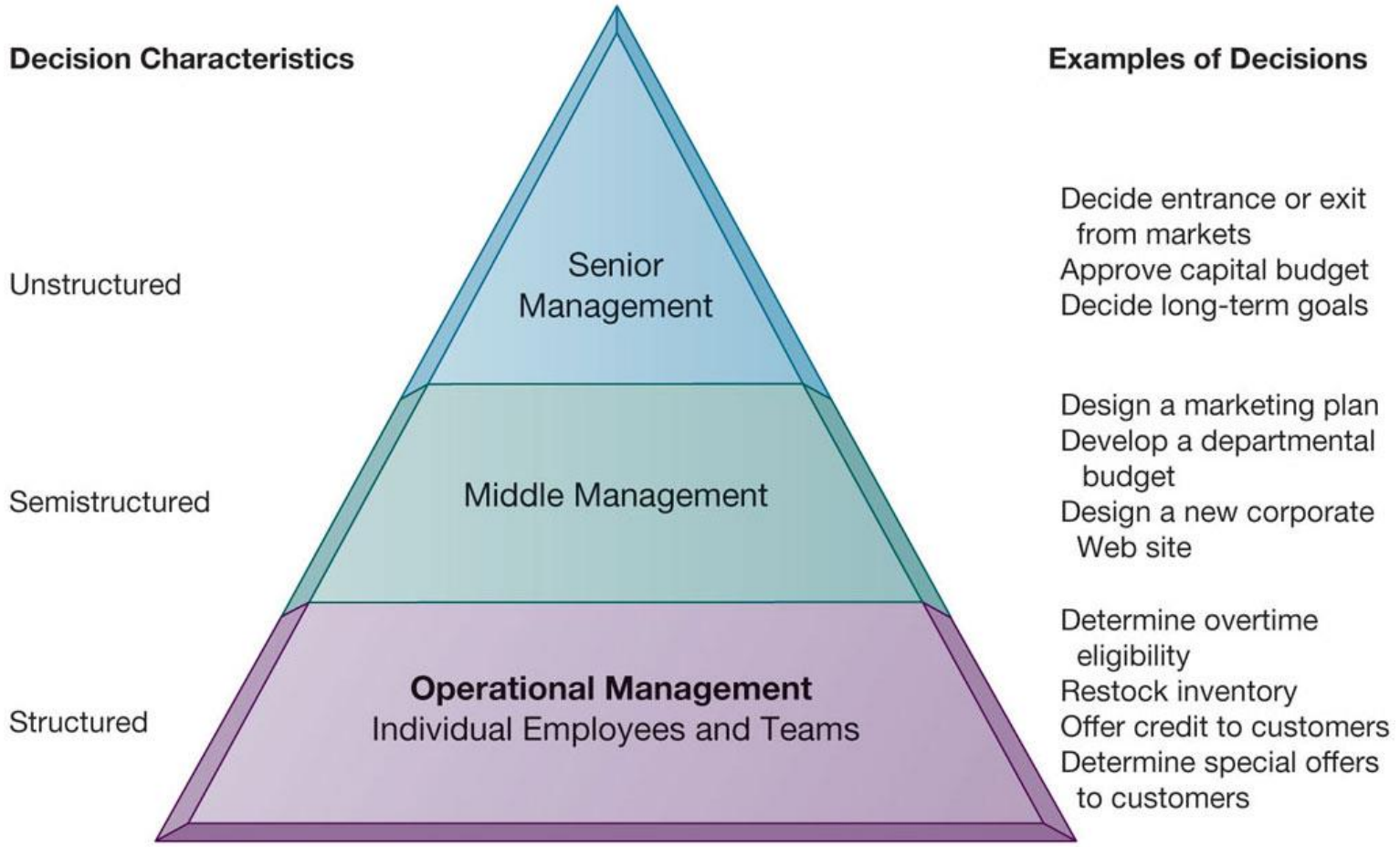
12.4 How do different decision-making constituencies in an organization use business intelligence, and what is the role of information systems in helping people working in a group make decisions more efficiently?

12.5 How will MIS help my career?

What Are the Different Types of Decisions, and How Does the Decision Making Process Work?

- Senior managers
  - Make many unstructured decisions
- Middle managers
  - Make more structured decisions but these may include unstructured components
- Operational managers and rank and file employees
  - Make more structured decisions

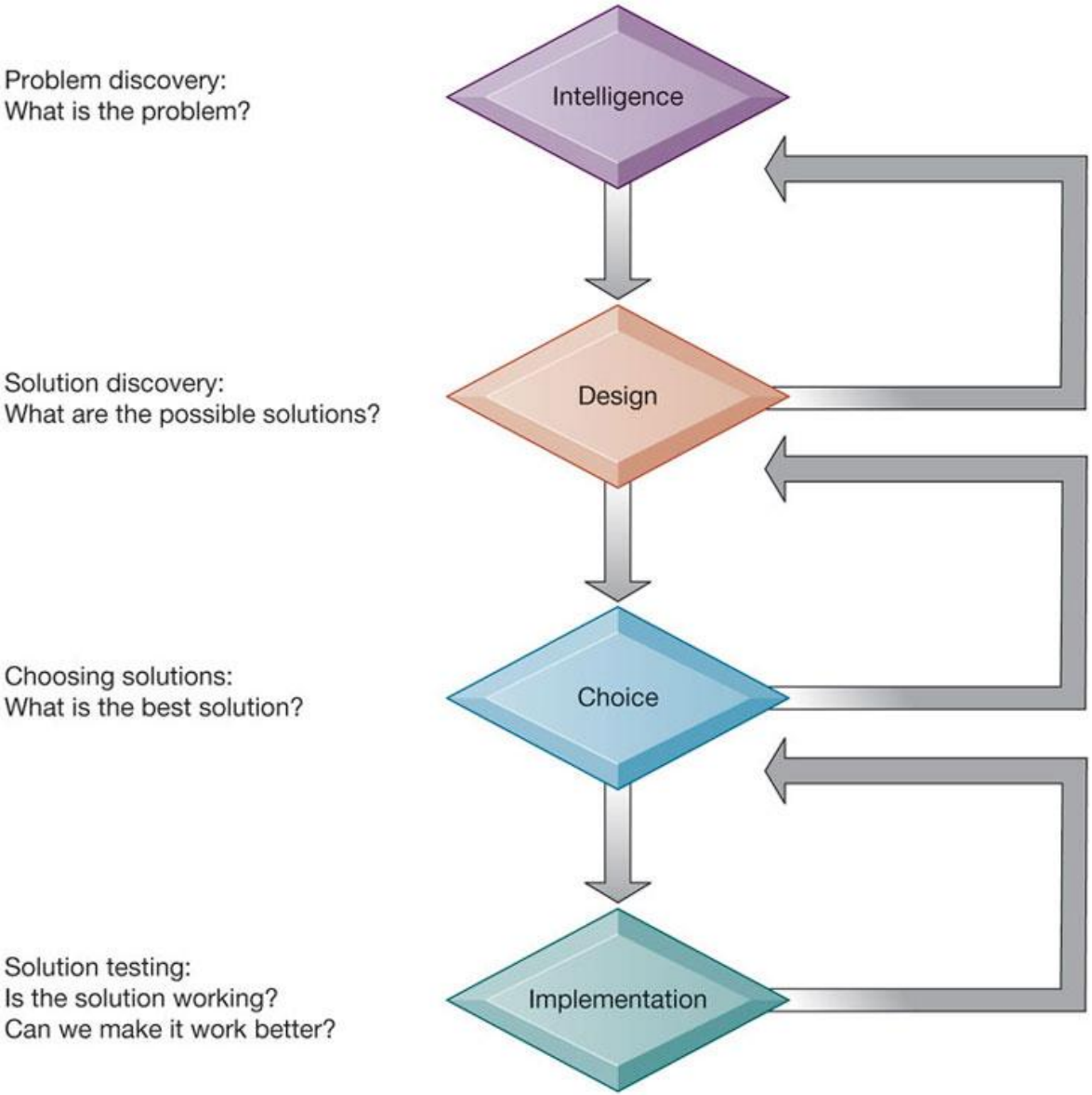
Figure 12.1
Information Requirements of Key Decision-Making Groups in a Firm



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

Figure 12.2 Stages in Decision Making



Pearson

Managerial Roles

- Information systems can only assist in some of the roles played by managers
- Classical model of management: five 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 (1 of 2)

- Interpersonal roles
  - Figurehead
  - Leader
  - Liaison
- Informational roles
  - Nerve center
  - Disseminator
  - Spokesperson

Mintzberg's 10 Managerial Roles (2 of 2)

- Decisional roles
  - Entrepreneur
  - Disturbance handler
  - Resource allocator
  - Negotiator

Real-World Decision Making

- Three main reasons why investments in IT do not always produce positive results
  - Information quality
    - High-quality decisions require high-quality information
  - Management filters
    - Managers have selective attention and have variety of biases that reject information that does not conform to prior conceptions
  - 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
- For example: High-speed computer trading programs
  - Trades executed in 30 milliseconds
- Require safeguards to ensure proper operation and regulation

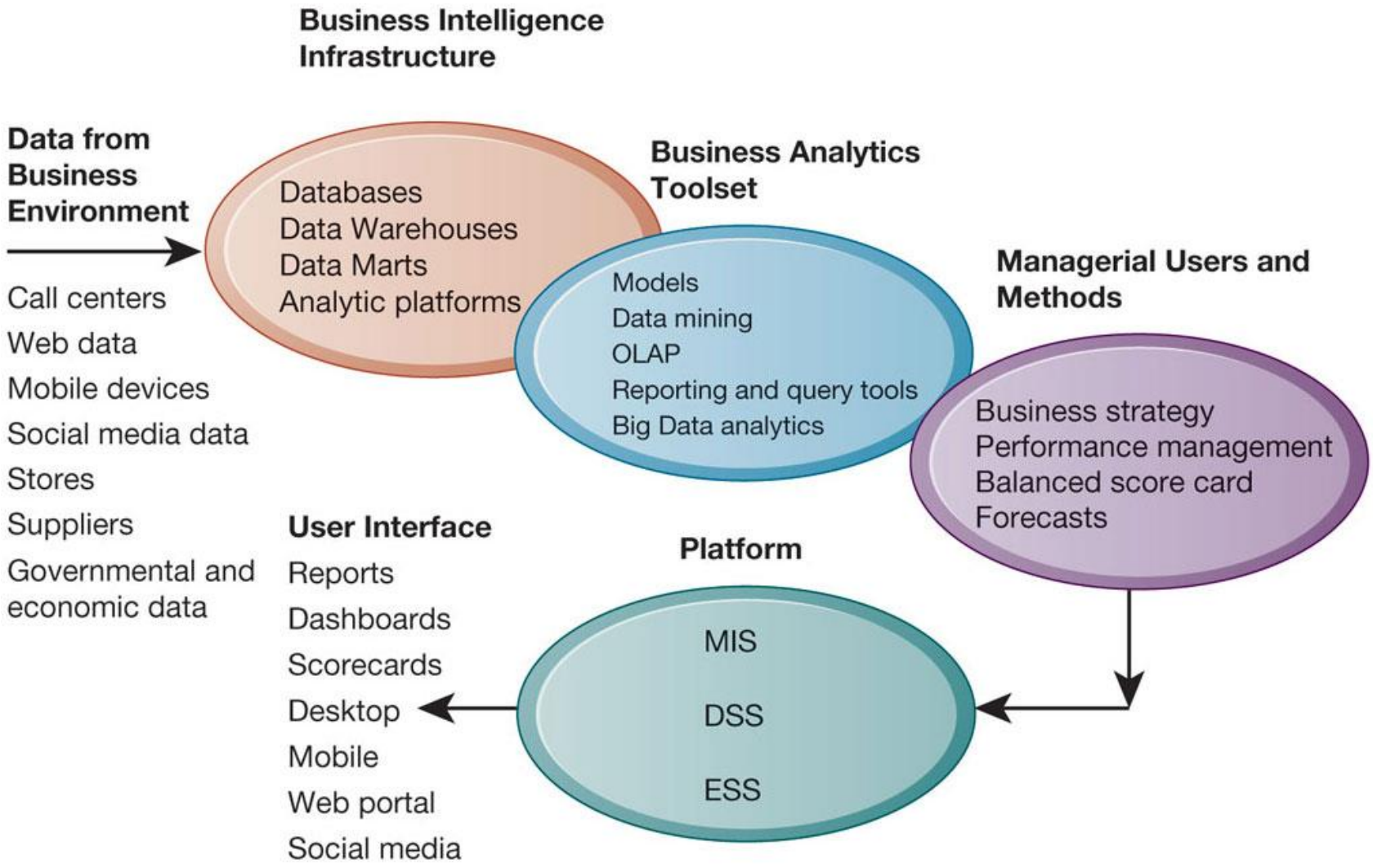
What is Business Intelligence?

- 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

The Business Intelligence Environment

- Six elements in the business intelligence environment
  - Data from the business environment
  - Business intelligence infrastructure
  - Business analytics toolset
  - Managerial users and methods
  - Delivery platform—MIS, DSS, ESS
  - User interface
    - Data visualization tools

Figure 12.3
Business Intelligence and Analytics for Decision Support



Business Intelligence & Analytics Capabilities

- Goal is to deliver accurate real-time information to decision makers
- Main analytic functionalities of BI systems
  - Production reports
  - Parameterized reports
  - Dashboards/scorecards
  - Ad hoc query/search/report creation
  - Drill down
  - Forecasts, scenarios, models

Table 12.4
Examples of Business Intelligence Predefined Production Reports

Business Functional Area	Production Reports
Sales	Forecast sales; sales team performance; cross-selling; sales cycle times
Service/call center	Customer satisfaction; service cost; resolution rates; churn rates
Marketing	Campaign effectiveness; loyalty and attrition; market basket analysis
Procurement and support	Direct and indirect spending; off-contract purchases; supplier performance
Supply chain	Backlog; fulfillment status; order cycle time; bill of materials analysis
Financials	General ledger; accounts receivable and payable; cash flow; profitability
Human resources	Employee productivity; compensation; workforce demographics; retention

Predictive Analytics

- Uses variety of data, techniques to predict future trends and behavior patterns
  - Statistical analysis
  - Data mining
  - Historical data
  - Assumptions
- Incorporated into numerous BI applications for sales, marketing, finance, fraud detection, health care
  - Credit scoring
  - Predicting responses to direct marketing campaigns

Big Data Analytics

- Big data: Massive datasets collected from social media, online and in-store customer data, and so on
- Help create real-time, personalized shopping experiences for major online retailers
- Smart cities
  - Public records
  - Sensors, location data from smartphones
  - Ability to evaluate effect of one service change on system

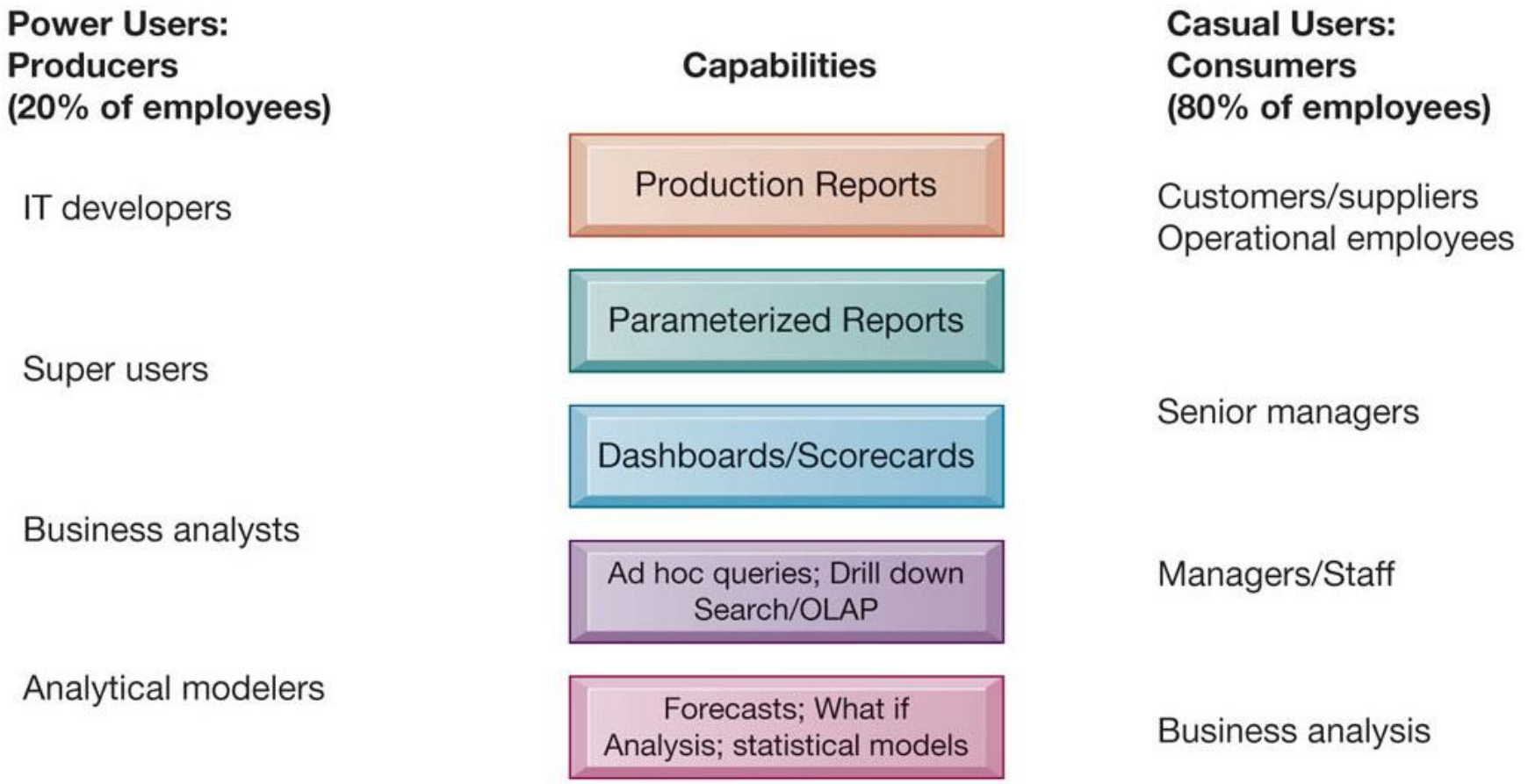
Operational Intelligence and Analytics

- Operational intelligence: Business activity monitoring
- Collection and use of data generated by sensors
- Internet of Things
  - Creating huge streams of data from web activities, sensors, and other monitoring devices
- Software for operational intelligence and analytics enable companies to analyze their big data

Location Analytics and Geographic Information Systems

- Location analytics
  - Ability to gain business insight from the location (geographic) component of data
    - Mobile phones
    - Sensors, scanning devices
    - Map data
- Geographic information systems (GIS)
  - Ties location-related data to maps
  - Example: For helping local governments calculate response times to disasters

Figure 12.4 Business Intelligence Users



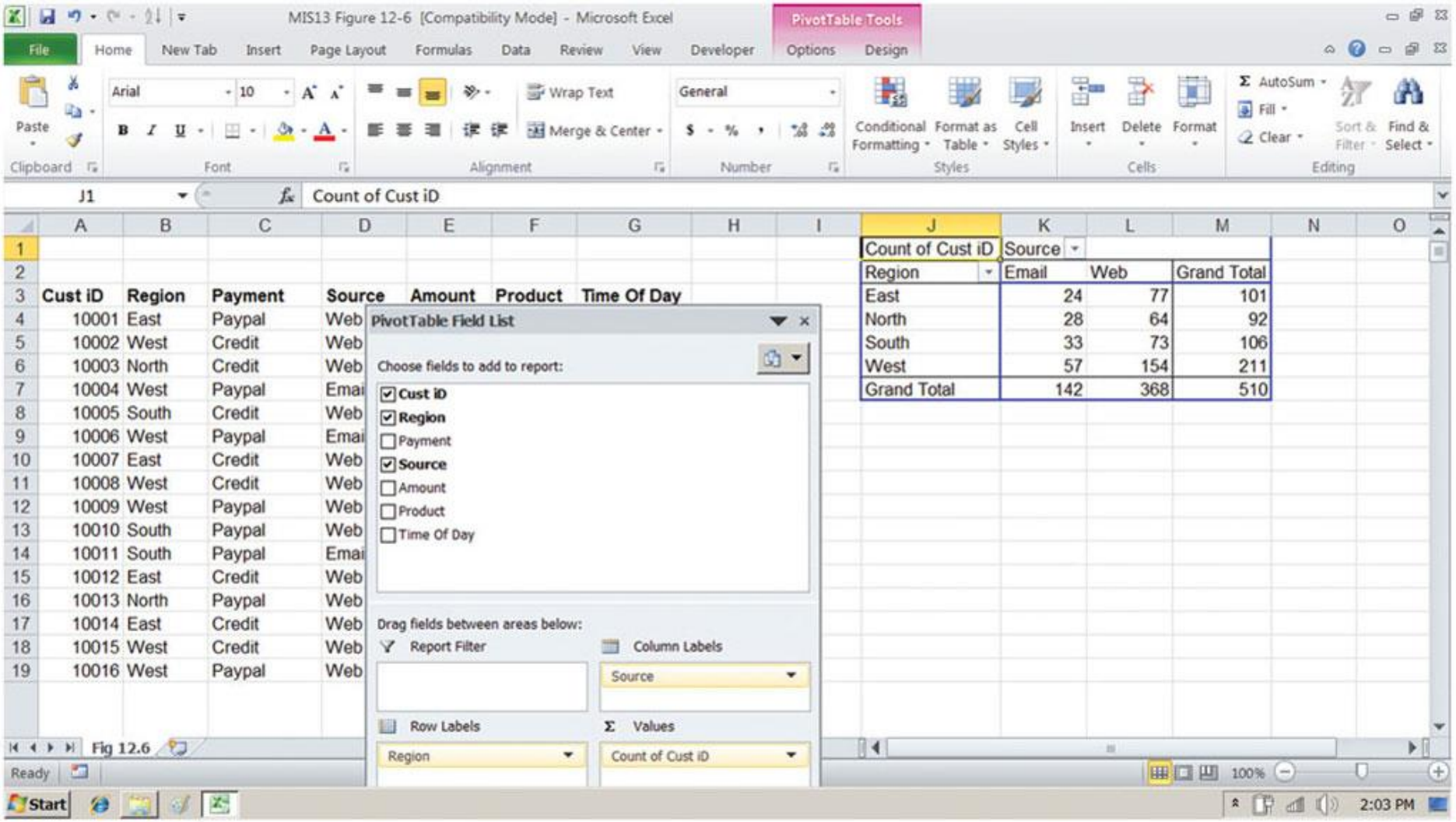
Support for Semistructured Decisions

- Decision-support systems
  - Support for semistructured decisions
- Use mathematical or analytical models
- Allow varied types of analysis
  - “What-if” analysis
  - Sensitivity analysis
  - Backward sensitivity analysis
  - Multidimensional analysis / OLAP
    - For example: pivot tables

Figure 12.5 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 12.6
A Pivot Table That Examines Customer Regional Distribution and Advertising Source



Decision Support for Senior Management (1 of 2)

- ESS: decision support for senior management
  - Help executives focus on important performance information
- Balanced scorecard method
  - Measures outcomes on four dimensions
    - Financial
    - Business process
    - Customer
    - Learning and growth
  - Key performance indicators (KPIs) measure each dimension

Figure 12.7 The Balanced Scorecard Framework

Decision Support for Senior Management (2 of 2)

- 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 toward targets

- Data for ESS
  - Internal data from enterprise applications
  - External data such as financial market databases
  - Drill-down capabilities

Group Decision-Support Systems (GDSS)

- Interactive system to facilitate solution of unstructured problems by group
- Specialized tools
  - Virtual collaboration rooms
  - Software to collect, rank, edit participant ideas and responses
- Promotes collaborative atmosphere, anonymity
- Cisco's Collaboration Meeting Rooms Hybrid (CMR)
- Skype for Business

Video Cases

- Siemens helps manufacturing companies to become digital enterprises
  - https://www.youtube.com/watch?v=tX1ddNDiVvI

- Digital Twin:
  - What is Digital Twin? How does it work?
    - https://www.youtube.com/watch?v=iVS-AuSjpOQ
  - Siemens - Why digital twins will be the backbone of industry in the future
    - https://www.youtube.com/watch?v=ObGhB9CCHP8

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