12-1 What are the different types of decisions, and how does the decision-making process work?
• List and describe the different levels of decision making and decision-making constituencies in organizations. Explain how their decision-making requirements differ.

Senior executives face many **unstructured** decision situations, such as establishing the firm's 5- or 10-year goals or deciding new markets to enter. Answering the question "Should we enter a new market?" would require access to news, government reports, and industry views as well as high-level summaries of firm performance. However, the answer would also require senior managers to use their own best judgment and poll other managers for their opinions.

Middle managers face more **structured** decision scenarios, but their decisions may include unstructured components. A typical middle-level management decision might be "Why is the reported order fulfillment report showing a decline over the past six months at a distribution center in Dubai?" This middle manager will obtain a report from the firm's enterprise system or distribution management system on order activity and operational efficiency at the Duba distribution center. This is the structured part of the decision. But before arriving at an answer, this middle manager will have to interview employees and gather more unstructured information from external sources about local economic conditions or sales trends.

Operational management and r**ank-and-file employees** tend to make more **structured** decisions. For example, a supervisor on an assembly line has to decide whether an hourly paid worker is entitled to overtime pay. If the employee worked more than eight hours on a particular day, the supervisor would routinely grant overtime pay for any time beyond eight hours that was clocked on that day.

A **sales account representative** often has to make decisions about extending credit to customers by consulting the firm's customer database that contains credit information. If the customer met the firm's prespecified criteria for granting credit, the account representative would grant that customer credit to make a purchase. In both instances, the decisions are highly structured and are routinely made thousands of times each day in most large firms. The answer has been preprogrammed into the firm's payroll and accounts receivable systems.

• Distinguish between an unstructured, semi-structured, and structured decision.
Unstructured decisions are those in which the decision maker must provide judgment, evaluation, and insight to solve the problem. Each of these decisions is novel, important, and nonroutine, and there is no well-understood or agreed-on procedure for making them.
Structured decisions , by contrast, are repetitive and routine, and they involve a definite procedure for handling them so that they do not have to be treated each time as if they were new.
semi-structured , where only part of the problem has a clear-cut answer provided by an accepted procedure.

• List and describe the stages in decision making.
Intelligence consists of discovering, identifying, and understanding the problems occurring in the organization—why a problem exists, where, and what effects it is having on the firm.
Design involves identifying and exploring various solutions to the problem.
Choice consists of choosing among solution alternatives.
Implementation involves making the chosen alternative work and continuing to monitor how well the solution is working.

12.2- How do information systems support the activities of managers and management decision making?
• Compare the descriptions of managerial behavior in the classical and behavioral models.
Managers play key roles in organizations. Their responsibilities range from making decisions, to writing reports, to attending meetings, to arranging birth- day parties. We are able to better understand managerial functions and roles by examining classical and contemporary models of managerial behavior.

The classical model describes formal managerial functions but does not address exactly what managers do when they plan, decide things, and control the work of others. For this, we must turn to the work of contemporary behavioral scientists who have studied managers in daily action. Behavioral models argue that the actual behavior of managers appears to be less systematic, more informal, less reflective, more reactive, and less well organized than the classical model would have us believe.

First, managers perform a great deal of work at an unrelenting pace—studies have found that managers engage in more than 600 different activities each day, with no break in their pace.
Second, managerial activities are fragmented; most activities last for less than nine minutes, and only 10 percent of the activities exceed one hour in duration.
Third, managers prefer current, specific, and ad hoc information (printed information often will be too old).
Fourth, they prefer oral forms of communication to written forms because oral media provide greater flexibility, require less effort, and bring a faster response.
Fifth, managers give high priority to maintaining a diverse and complex web of contacts that acts as an informal information system and helps them execute their personal agendas and short and long-term goals.

• Describe high-velocity automated decision making and its benefits and risks.
The class of decisions that are highly structured and automated is growing rapidly. What makes this kind of automated high-speed decision making possible are computer algorithms that precisely define the steps to be followed to produce a decision, very large databases, very high-speed processors, and software optimized to the task. In these situations, humans (including managers) are eliminated from the decision chain because they are too slow. This

also means organizations in these areas are making decisions faster than what managers can monitor or control.

• Identify the specific managerial roles that can be supported by information systems.

Interpersonal Roles

Managers act as figureheads for the organization when they represent their companies to the outside world and perform symbolic duties, such as giving out employee awards, in their interpersonal role . Managers act as leaders, attempting to motivate, counsel, and support subordinates. Managers also act as liaisons between various organizational levels; within each of these levels, they serve as liaisons among the members of the management team. Managers provide time and favors, which they expect to be returned.

Informational Roles

In their informational role , managers act as the nerve centers of their organizations, receiving the most concrete, up-to-date information and redistributing it to those who need to be aware of it. Managers are therefore information disseminators and spokespersons for their organizations.

Decisional Roles

Managers make decisions. In their decisional role , they act as entrepreneurs by initiating new kinds of activities, they handle disturbances arising in the organization, they allocate resources to staff members who need them, and they negotiate conflicts and mediate between conflicting groups.

12-3* How do business intelligence and business analytics support decision making?

• Define and describe business intelligence and business analytics

Business intelligence (BI) is a term used by hardware and software vendors and information technology consultants to describe the infrastructure for ware- housing, integrating, reporting, and analyzing data that come from the business environment, including big data. The foundation infrastructure collects, stores, cleans, and makes relevant information available to managers. Think databases, data warehouses, data marts, Hadoop, and analytic platforms. Business analytics (BA) is also a vendor-defined term that focuses more on tools and techniques for analyzing and understanding data. Think online analytical processing (OLAP), statistics, models, and data mining.

• List and describe the elements of a business intelligence environment.

There are six elements in this business intelligence environment:

• **Data from the business environment:** Businesses must deal with both structured and unstructured data from many different sources, including big data. The data need to be integrated and organized so that they can be analyzed and used by human decision makers.

• **Business intelligence infrastructure:** The underlying foundation of business intelligence is a powerful database system that captures all the relevant data to operate the business. The data may be stored in transactional databases or combined and integrated into an enterprise-data warehouse or series of interrelated data marts.

• **Business analytics toolset:** A set of software tools are used to analyze data and produce reports, respond to questions posed by managers, and track the progress of the business using key indicators of performance.
• **Managerial users and methods:** Business intelligence hardware and software are only as intelligent as the human beings who use them. Managers impose order on the analysis of data using a variety of managerial methods that define strategic business goals and specify how progress will be measured. These include business performance management and balanced scorecard approaches focusing on key performance indicators and industry strategic analyses focusing on changes in the general business environment, with special attention to competitors. Without strong senior management oversight, business analytics can produce a great deal of information, reports, and online screens that focus on the wrong matters and divert attention from the real issues.
• **Delivery platform**—MIS, DSS, ESS: The results from business intelligence and analytics are delivered to managers and employees in a variety of ways, depending on what they need to know to perform their jobs. MIS, DSS, and ESS , which we introduced in Chapter 2 , deliver information and knowledge to different people and levels in the firm—operational employees, middle managers, and senior executives. In the past, these systems could not share data and operated as independent systems. Today, one suite of hardware and software tools in the form of a business intelligence and analytics package is able to integrate all this information and bring it to managers' desktop or mobile platforms.
• **User interface:** Businesspeople are no longer tied to their desks and desktops. They often learn quicker from a visual representation of data than from a dry report with columns and rows of information. Today's business analytics software suites feature data visualization tools, such as rich graphs, charts, dashboards, and maps. They also are able to deliver reporton iPhones, iPads, and other mobile handhelds as well as on the firm's web portal. BA software is adding capabilities to post information on Twitter, Facebook, or internal social media to support decision making in an online group setting rather than in a face-to-face meeting.

• List and describe the analytic capabilities provided by BI systems.
• **Production reports:** These are predefined reports based on industry- specific requirements
• **Parameterized reports:** Users enter several parameters as in a pivot table to filter data and isolate impacts of parameters. For instance, you might want to enter region and time of day to understand how sales of a product vary by region and time. If you were Starbucks, you might find that customers in the East buy most of their coffee in the morning, whereas in the Northwest customers buy coffee throughout the day. This finding might lead to different marketing and ad campaigns in each region. (See the discussion of pivot
• **Dashboards/scorecards:** These are visual tools for presenting performance data defined by users.
• **Ad hoc query/search/report creation:** These allow users to create their own reports based on queries and searches.
• **Drill down:** This is the ability to move from a high-level summary to a more detailed view.
• **Forecasts, scenarios, models**: These include the ability to perform linear forecasting and what-if scenario analysis and analyze data using standard statistical tools.

• Define operational intelligence and explain how the Internet of Things improves it.
Many decisions deal with how to run the business of these cities on a day-to-day basis. These are largely operational decisions, and this type of business activity monitoring is called operational intelligence .
The Internet of Things is creating huge streams of data from web activities, smartphones, sensors, gauges, and monitoring devices that can be used for operational intelligence about activities inside and outside the organization. Software for operational intelligence and analytics enables organizations to analyze these streams of big data as they are generated in real time. Companies can set trigger alerts on events or have them fed into live dashboards to help managers with their decisions.

• Compare two different management strategies for developing BI and BA capabilities.
There are two different strategies for adopting BI and BA capabilities for the organization: one-stop integrated solutions versus multiple best-of-breed vendor solutions.
The first solution carries the risk that a single vendor provides your firm's total hardware and software solution, making your firm dependent on its pricing power. However, it offers the advantage of dealing with a single vendor who can deliver on a global scale. The second solution offers greater flexibility and independence, but with the risk of potential difficulties integrating the software to the hardware platform, as well as to other software. Vendors always claim their software is "compatible" with other software, but the reality is that it can be very difficult to integrate software from different vendors.

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?
• List each of the major decision-making constituencies in an organization and describe the types of decisions each makes.
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• Define and describe the balanced scorecard method and business performance management.
Th**e balanced scorecard** is a framework for operationalizing a firm's strategic plan by focusing on measurable outcomes on four dimensions of firm performance: financial, business process, customer, and learning and growth.
Another closely related popular management methodology is business performance management (BPM) . Originally defined by an industry group in 2004 (led by the same companies that sell enterprise and database systems like Oracle, SAP, and IBM), BPM attempts to systematically translate a firm's strategies (e.g., differentiation, low-cost producer, market share growth, and scope of operation) into operational targets. Once the strategies and targets are identified, a set of KPIs are developed that measure progress toward the targets. The firm's performance is then measured with information drawn from the firm's enterprise database

systems. BPM uses the same ideas as the balanced scorecard but with a stronger strategy flavor.

• Define a group decision-support system (GDSS) and explain how it differs from a DSS.
Group decision-support systems (GDSS) are interactive computer-based systems that facilitate the solution of unstructured problems by a set of decision makers working together as a group in the same location or in different locations. Originally, GDSS required dedicated conference rooms with special hardware and software tools for documenting and ranking ideas. GDSS capabilities have evolved along with the power of desktop PCs, the explosion of mobile computing, and the rapid expansion of bandwidth on Wi-Fi and cellular networks. Dedicated rooms for collaboration can be replaced with much less expensive and flexible virtual collaboration rooms that can connect mobile employees with colleagues in the office sitting at desktops in a high-quality video and audio environment.