LESSON PREVIEW

Business Management Systems

In the rapidly changing and evolving world today, businesses must also continually change or will most likely fail. Data are being generated at an unprecedented rate and can be collected and analyzed as information changes—in real time. Using this data to monitor performance and to ensure that a business responds appropriately is a daunting task. Today's businesses must rely on technology to both generate the necessary data and interpret that data. Businesses today, more than ever, depend on business management systems.

Business management systems are used for all aspects of business life, including human resources, inventory control, customer relations, decision making, project management, and interpreting the exponentially growing world of Big Data.

After completing this section, you will be able to:

- Explain the purpose of business management systems.
- Explain what human resource management (HRM) is and describe the use of various categories of HR management systems, including recruiting and hiring, compensation management, benefits management, and employee evaluation.
- Explain what inventory management systems do and how they are used.
- Describe the necessity for customer relationship management (CRM) and how CRM systems are used in large and small businesses.
- Explain how decision-making process management information systems are used.
- Describe the five processes involved in a decision-making process management information system: design, modeling, execution, monitoring, and optimization.
- Differentiate between a project and other types of work.
- Describe what a Gantt chart is and how it is used in project management.
- Describe the four phases involved in project management: initiation, planning, execution, and closure.
- Define and explain the use of business intelligence software.
- Describe the necessary techniques involved in business intelligence software, including data mining, visualization, predictive analytics, and Big Data.

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Moore's Law

Moore's law was first described by Gordon Moore sixty years ago. It states that the number of transistors on a computer chip will double approximately every eighteen months. The significance of this is as follows: As programmers create software that can use the increased computing capability, older devices may be unable to handle the new software. This means devices must be replaced or updated often. While Moore noticed this phenomenon long ago, it has proven true and will, most likely, continue to necessitate that businesses (and everyone, including you!) replace electronic devices on a faster and faster timetable.

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Business Management Systems and Their Components

Business management systems are used to increase management efficiency using the technological advances in the area of management. A business management system needs three major components:

- **Database management systems (DBMS):** This type of system is used to store and classify information. A DBMS accepts input, verifies input, allows for data searches, and allows managers to create reports.
- **Predictive information systems:** This type of system assists managers with handling possibilities. A predictive information system allows managers to deal with "what-if" scenarios such as: ***What*** would happen to overall production costs ***if*** the cost of one item increases?
- **Decision-making information systems:** This type of system integrates the DBMS with the predictive information system to provide managers with statistical and other analyses to assist them in making decisions.

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Business Management Systems Implementation

When managers decide to use business management systems, they need to decide how the system will operate with any existing systems. There are always both human (employee) and technical issues that arise when integrating a new system with what currently exists. Managers must ensure that the improvements derived from the transition will be worth the pain.

They also must decide where to house the system. The three options are:

On-premise: In an on-premise system, the organization has complete control of the system. It can be configured to meet the unique needs of the organization. However, the cost of implementation; the hiring of qualified technical personnel; and the tasks of maintaining, updating, and securing the system all must be considered.

Cloud based: Cloud storage sites offer security systems, and server size can be scaled to meet an organization's size and needs. Minimal hardware needs to be purchased, thus reducing the need to maintain an entire in-house IT team. However, cost is a factor with a Cloud-based system.

SaaS based: Software as a Service keeps hardware and software on the premises and stores a custom management system on the Cloud. It ensures that software complies with the latest regulations and minimizes security concerns. However, it may not be customizable.

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Human Resource Management Systems

Most business executives agree that employees are an organization's most important asset. Managing employees is the job of human resources (HR). It is an awesome task, and most companies today rely on software to assist HR personnel. HR management systems must deal with the many aspects of employee data and behavior.

Human resource management (HRM) systems work to determine future HR needs and deal with recruiting, training, retaining, compensating, appraising, promoting, reassigning, and firing employees. The system also involves dealing with the increasing and extensive governmental oversight regarding employees. This includes updating the system to match changing legislation and maintaining unimpeachable data integrity.

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The History of Human Resource Management Systems

HRM systems have existed for at least as long as recorded history, as far in the past as can be seen from Egyptian hieroglyphics, which indicate that scribes and priests were dedicated to the organization of workforces.

In the late nineteenth century, time clocks and punch cards were used to track employee work hours. These systems were made far more sophisticated by the development of computers in the last half of the twentieth century.

SAP, one of the largest HRM systems today, was developed in the 1970s. The larger systems, such as SAP and Oracle, focus on the needs of major corporations while many smaller systems focus more on the needs of small to midsize companies.

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Category 1: Human Resource Management Systems

To understand HRM systems, one must distinguish the roles filled by HR managers.

HR managers determine future workforce needs by considering things such as the direction of the firm, the predicted state of the workforce, and so on. They must consider both internal requirements (the needs of the company) and the external environment (what the world will need and what will be available).

HR managers also need to consider managing the workforce when it comes to things such as benefits, hiring and firing practices, policies (e.g., dress codes), sick leave, and lateness. They also deal with how discrimination and harassment claims are dealt with, and much more.

The categories of HRM system software include recruiting and hiring, compensation, benefits, and employee evaluation.

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Category 2: Human Resource Management Systems

Recruiting and Hiring Management Systems: As the world changes, so do the hiring requirements for a business. An industry that is booming today could easily become obsolete in five years. The company could reposition itself and move production to a new product, which would have a profound effect on that company's current employees as well as on future hiring needs. HR managers need sophisticated software to predict accurate estimates of recruiting, hiring, and training requirements.

Compensation Management Software: Employee compensation strategy can make or break a corporation. Inappropriate and inconsistent compensation can demotivate the strongest workforce. Ensuring that employees are compensated correctly is key to a company's success.

Benefits Management Software: Benefits management software is used to track employee hiring dates, marital status, benefits choices, and usage. HR managers also need to ensure that their software is continually updated to reflect current legislation.

Employee Evaluation Management Software: Tracking the performance of employees is a critical component of HRM. Many states require significant documentation of substandard performance prior to any employee's demotion or dismissal, while an equitable means of ranking performance can serve as a strong employee motivator.

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Inventory Management Systems

Inventory is an important part of many businesses. Overstocked inventory can result in higher production costs as money needed elsewhere is tied up in unused inventory. If items have a limited shelf-life, overstocking can result in lost revenue when items cannot be sold or must be sold at a discount. When understocked, revenue is lost if customer requests cannot be met and also may result in unhappy customers.

Managers rely on **inventory management systems** to determine the correct levels of inventory. The use of UPC codes in the 1970s was among the first business management systems. In the 1990s, RFID technology allowed faster real-time inventory tracking, and in the 2000s Cloud-based inventory management streamlined the process.

Modern inventory management systems focus on inventory optimization. The **reordering point** identifies when stock should be replenished. Modern systems also provide forecasting information and can trigger automatic reorders.

Most inventory management systems are integrated with other business management systems. When selecting an inventory management solution, it is best to use a system that integrates with existing software to minimize training time for employees.

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Customer Relationship Management Systems in Business

It is less expensive to retain an existing customer than it is to acquire a new customer. Managers use **customer relationship management (CRM)** systems to target profitable customers, improve pricing decisions, enhance customer service, create individualized products, and customize marketing messaging to personalize and enhance each customer's experience.

A CRM uses analytics and data analysis to identify the most valuable customers and to target future customers. It is also used to promote strong relationships with suppliers and other colleagues.

CRMs collect customer information such as email, phone numbers, and social media data and combine this with buying habits to anticipate customer needs and wishes. CRMs are often incorporated with other systems such as inventory management.

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Decision-Making Process Management Information Systems and Business Process Management

The amount of data created each day is staggering. On one hand, this means more information is available to managers than ever before. On the other hand, it is virtually impossible for any one person, or even a group of people, to assess all this data and use it for informed decision making without help.

Decision-making process management information systems provide tools to assist managers to use vast amounts of data to improve decision making and integrate DBMS with predictive analytics.

Business process management (BPM) systems can streamline an organization's activity to prevent backlogs and inefficiencies.

BPM systems normally use five steps to create efficiencies: They examine the design of the process, model the process to fit the parameters of the system, run the process, monitor the process, and initiate process improvements to maximize efficiencies.

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Business Process Management: The Five Processes

1: Process design examines processes and breaks them down into their individual components. Analysts normally use **storyboards** to view the entire system and identify redundancies.

2: Process modeling allows managers to input variables into the process design. Analysts use flowcharts and other tools to depict workflow, the sequence of operations, and decision points. The process uses software called **business processes execution language (BPEL)** that allows it to be run in a BPEL engine.

3: Process execution runs through the BPEL engine. It provides managers with real-time decision-making opportunities and allows managers to execute **what-if** options by changing inputs.

4: Process monitoring allows managers to track individual components of the process as well as the process as a whole to measure the performance of the engine. This step allows for **business activity monitoring (BAM)** and lets managers identify bottlenecks and other issues.

5: Process optimization is the final phase, giving managers the opportunity to identify potential slowdowns or savings opportunities and allows for a continually improving process. It is a feedback step because, as improvements are implemented, the process can be executed again and the results reanalyzed.

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Project Management Tools and Processes

A **project** can be distinguished from other types of work because it has a starting and an ending point and specific deliverables. For example, a business that decides to offer a new product is creating a project. After the product is on the market, however, the job of tracking sales, maintaining production, and so on, is not part of the project.

Project management (PM) software is an indispensable aid in the successful completion of a project. Project management includes scheduling, forecasting, resource allocation, tracking, task management, budgeting, and execution. PM software is designed to organize these items and enable collaboration as well as to provide security for project management. Managers use Gantt charts and implement the four major phases of the PM process: initiation, planning, execution, and closure.

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Gantt Charts

In the early twentieth century, Henry Gantt developed a horizontal bar chart that was used to visualize a project schedule. Today, the **Gantt chart** is the most widely used tool in project management.

A Gantt chart breaks down a project into its component parts, showing which tasks can be done concurrently and which are dependent upon the completion of preceding tasks. PM software uses Gantt charts to display project plans and the four phases of the PM process.

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The Project Management Process: The Four Phases

The four phases of the PM process are:

- **1. Initiation phase:** The manager outlines and documents the requirements of the project, identifies goals, and analyzes costs. A projected timeline for deliverables is created. Stakeholders are identified, and a statement of work is created.
- **2. Planning phase:** The project is broken down into component parts and a Gantt chart is created. Budget and funding timelines are developed, including when resources such as supplies and labor should be obtained. Coordination with stakeholders is scheduled.
- **3. Execution phase:** If the first two phases are done well, this may go smoothly. However, this is when contingencies are identified and, through monitoring, dealt with to minimize impact. A Gantt chart software system can be used to simplify progress.
- **4. Closure phase:** In this phase, the manager reviews the team's performance, documents lessons learned during execution, and compiles information for use in future projects. This is an opportunity for stakeholders to provide input about how the project met their expectations. Finally, all associated contracts can be terminated.

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Project Management Software Tools

Most PM systems software today are located in the Cloud to reduce security risks and allow collaboration among stakeholders. The software usually includes storage solutions, which allow stakeholders to upload necessary files as well as tools that allow for rescheduling and for generating reports. The software also includes visual depictions of the projects, usually in the form of Gantt charts.

Software used by large businesses may include permission levels to ensure that only people who need access to various parts of a project get that access. However, smaller businesses may not need permission levels. Large businesses typically use PM software that is part of their enterprise resource planning (ERP) solution. For large corporations, this may be SAP or Oracle. Small businesses have many PM software choices that may better align with their needs.

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Business Intelligence and Its Implementation

Business intelligence (BI) refers to the software and processes that allow organizations to capitalize on the power of Big Data and predictive analytics. BI uses data mining techniques to combine and add data visualization tools so that managers can make faster and more informed decisions.

Data mining includes accessing external databases and internal data. **Predictive analytics** uses algorithms to predict outcomes based on a given set of inputs. BI helps managers identify potential opportunities and threats.

If the input to a software system is not good, the output will probably be worthless, as reflected in the common saying: “Garbage in – garbage out.” It is important to remember this when choosing BI software. Users must be able to use the software appropriately and without a large learning curve. Therefore, the choice of BI software must include consideration of these factors and, when possible, choose software from an organization that is familiar to their employees.

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Data Science and Big Data Analytics

Data science refers to the process of gathering, storing, and searching relevant data from databases. **Big Data analytics** refers to the technology and processes used to gain intelligent, usable information from these databases. Data visualization tools are used to convey meaning from Big Data analytics to managers who make decisions based on this data.

The sheer volume of information available has made it impossible for managers to use this information for decision making without the use of analytics.

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Data Visualization Tools

BI and associated Big Data analytics have no value if the information cannot be interpreted and presented effectively. Therefore, one of the most important features of any BI system is its **visualization tools.** Most BI software platforms include a dashboard that displays an overview of the data and allows users to dig deeper into various aspects of the analytics. Search features are also included.

When choosing a data analytics platform, managers must decide on which analytics tools are the strongest for their firm, as well as which analytics platform provides the most useful visual tools for their decision makers.

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Data Analytics Software Platforms

The choice of which **data analytics software** platform to use is an important and, often, not a simple choice.

Much of the information managers need to make good decisions is complex and nuanced. Visual depictions of the data can go far to make this information clear and understandable. Therefore, the visual depictions offered by a platform may be as important as the data itself.

The choice of a BI system is extremely important. The decision may be based on what system the organization is already using since this might be the easiest to implement and learn. However, another significant factor is the software's power to provide analytics. Sometimes the most powerful analytics are in a system that is challenging to learn. These factors all must be weighed when choosing a data analytics software platform.

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