LESSON PREVIEW

Business Computer Applications

Perhaps a century ago you could pursue a degree in business when you went to college. Today, running a business involves so many parts and pieces that specialization is required. We've all heard of a business's CEO (chief executive officer), but many C-level titles are given to high-ranking officials to mark their duties, responsibilities, and areas of expertise. A few of the many C-level titles include CFO (chief financial officer), CIO (chief information officer), CMO (chief marketing officer), CTO (chief technology officer), and another CEO (chief engineering officer). Combined with the current global economy and the impact of Big Data streaming in continuously, all of which impact businesses, both large and small, the task of managing a business is a monumental endeavor.

Management information systems technology has responded to the need for software to assist managers in their specific fields. This module describes the various applications that are used to assist managers in all aspects of running a business, including transaction processing, decision support systems, executive information systems, marketing management, human resources, enterprise resource planning, supply chain management, and customer relationship management.

After completing this section, you will be able to:

- Explain how businesses use specific applications to assist managers.
- Describe the various types of business applications software used by managers.
- Describe transaction processing systems and how they impact the business world.
- Explain how a cash register was a simple transaction processing system.
- Describe how the transaction processing system led to merchant service aggregators.
- Describe the services provided by PayPal, Stripe, Square, and QuickBooks.
- Explain what is meant by decision support systems software and its impact on the business world.
- Describe the fields in which decision support systems are commonly used.
- Describe the three components of a decision support system.
- Describe how AI impacts decision support systems.
- Describe executive information system software and how it impacts the business world.
- Describe the elements and major categories of executive support system software.
- Describe executive operations management software.
- Describe executive financial management software.
- Describe executive marketing management software.
- Describe executive human resources management systems software.

- Explain what is meant by enterprise resource planning system software and how it impacts the business world.
- Define the elements of enterprise resource planning system software.
- Describe what is meant by supply chain management systems software and how it impacts the business world.
- Describe the elements of a supply chain management system.
- Describe the functions of supply chain management software.
- Describe how supply chain management software feeds enterprise resource planning software.
- Explain what is meant by customer relationship management software and how it impacts the business world.
- Describe the functions of customer relationship management software.

NOTES

Processing Payments

The single biggest impact of **management information systems** technology has been in business applications that allow credit and debit payments to be processed virtually instantly.

For many years, if a customer wanted to pay by credit card, the card was run through an imprinter, which made carbon copies of the raised numbers and letters on the face of the credit card. The copies were hard to read and easily lost. Verifying a customer's card was a long and tedious process, often involving telephone calls or using large books with numbers of lost or stolen cards. Moreover, the information about sales had to be entered by hand. Traveler's checks were another inconvenient way for customers to pay for items.

Today, Internet connectivity allows vendors to accept credit cards from almost anywhere in the world, and the card can be validated within seconds.

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Transaction Processing Systems

Transaction processing systems help to make the sales process itself more efficient. The transition from a **barter system** to a money system of exchange increased the efficiency of trade. Just as cash and other financial instruments allowed retailers to move away from an inefficient system of bartering, transaction processing systems allow methods of exchanging money for goods and services to operate more efficiently.

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The Cash Register

For nearly a century, the **cash register** remained the primary means of transacting payments. The cash register was invented in the 1880s by James Ritty. It included a bell that would ring each time the cash drawer was opened, alerting the shop owner and giving us the term “ringing up a sale.” It allowed a shopkeeper to verify that the amount of cash in the till matched the total shown by the register itself. After Ritty sold his invention, it became National Cash Register (NCR) Corporation.

The **point-of-sale** (**POS**) terminal effectively eliminated the traditional cash register. It not only displays the amount of cash in the till, but provides inventory information and an interface for debit and credit cards, smartphone payments, check processing, and a host of other tools.

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Merchant Service Aggregators

Large businesses, with significant numbers of credit card sales, typically work through a **merchant service provider** (or **merchant account provider**) to process the credit card payments. The merchant service provider has a relationship with an acquiring bank that is authorized to process the payments. The acquiring bank assumes the risk of the lost funds if the business closes and fails to provide the products that were purchased with credit cards or if an item is returned, or a customer disputes a charge. Because of the risk, acquiring banks and merchant service providers (ISOs) are reluctant to establish accounts with smaller, riskier businesses.

To support small businesses, **merchant service aggregators** (or **merchant account aggregators**), allow small businesses to share merchant accounts. They charge slightly higher fees and have lower annual processing limits, but most small-business owners believe that the increased sales that accompany the ability to accept credit cards make the expense well worth it.

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PayPal, Stripe, Square, and QuickBooks

PayPal was originally called X.com. It was created by Elon Musk, but the name was changed when X.com merged with Confinity, Inc. It allows payment transfers over the Internet. Through PayPal, account holders can send or receive payments, convert currency, and accept debit and credit card payments.

In 2012, Patrick and John Collison developed software called **Stripe** that would easily integrate with other business software so that these existing apps could accept credit card payments. Initially, Stripe sold the software interface so that websites and apps, such as Lyft, could integrate credit card payment processing. Later, it expanded into the point-of-sale (POS) market and now offers merchant aggregator services to brick-and-mortar businesses.

Square was created by Jack Dorsey in 2009, which began as a card reader and iPhone app and soon joined with Apple to create the Square Stand, which combines an iPad, a cash drawer, a thermal printer, and a chip/swipe/contactless reader as an inexpensive POS terminal. While PayPal is a popular aggregator for online businesses, Square is widely used by brick-and-mortar businesses in the United States.

QuickBooks is the dominant financial services software for small businesses in the United States. Intuit founders Scott Cook and Tom Prouix developed QuickBooks for small-business owners. In 1993, Intuit purchased TurboTax software, allowing QuickBooks to become the leading small-business accounting software provider. In 2003, it created QuickBooks Payments to offer credit card processing and merchant aggregator services and, in 2006, added payroll services to its software. QuickBooks Online partners with Mammoth/ThinkHR to provide HR services.

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Decision Support Systems

Decision support system (**DSS**) software, also known as **business intelligence** (**BI**) software, provides decision makers with the information necessary to solve problems in complex and rapidly changing environments.

DSSs only became capable of accomplishing these tasks through the use of computers and, as hardware improves, so too did the capability of DSSs. Today, nearly all businesses use some sort of DSS, from areas such as advertising to hiring and training, as well as inventory and production management.

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Three Components of DSS

The three basic components of a decision support system are:

- Data: This may be a database or a data warehouse.
- Methodology: This is the model of the DSS and is made of complex software used to make the determinations and recommendations.
- User interface: This is where the decisions are actually implemented. It includes a dashboard that can be modified to meet the needs of each user.

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Major Providers of DSS

- Microsoft Power BI
- SAP's Business Objects platform
- Tableau, owned by Salesforce
- Intuit's QuickBooks does not have a DSS, but many companies provide business analytics software that integrate with QuickBooks.

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How Artificial Intelligence Impacts DSS

The model of a DSS or BI system adapts its processes based on the degree of accuracy of each prior decision, which means that most DSSs can be considered to have a type of artificial intelligence (AI).

A simple example: A marketing manager wishes to know if increasing the advertising budget on social media will result in a higher return-on-investment. A DSS could determine how much of an increase would result in the desired sales growth. If the actual sales data deviated from the DSS determination, the DSS would adjust accordingly when making future recommendations.

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Executive Information System Software

An **executive support system** (**ESS**), sometimes referred to as an **executive information system** (**EIS**), is a version of DSS or BI software designed to expressly meet the needs of senior corporate executives of larger companies or corporations. ESS applications obtain data from both internal and external sources and use the data to help executives gain a broader view of the competition.

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Elements of ESS Software

The key element of any ESS or EIS is an intuitive user interface, the **dashboard**. This interface provides the ability to quickly scan the organization and note any discrepancies from anticipated norms and allows the executive to drill down into areas of concern. ESS software focuses on operations, finance, marketing, and human resources management.

Another element of an ESS is the ability to communicate throughout the executive's department or area of responsibility. An item of interest may be circled or highlighted with a notation for additional information.

The final element of any ESS is the software infrastructure supporting the system. The software requirements for ESS include the interface with both internal and external databases, as well as the analytical models used to support the requirements of the executive.

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Major Categories of EIS Software

Executive support systems software is usually tailored to meet five categories of needs of the specific organization and the executive's role in the firm. These include:

- Operations management: Focuses on organizational processes and manufacturing
- Financial management: Addresses budgeting, revenue, expenses, asset management, debt, credit, investment, tax minimization, and other financial matters
- Marketing: Focuses on sales, promotions, and customer relationship management
- Human resources management (HRM): Allows executives to address personnel requirements
- Supply chain management (SCM): Allows executives to address logistics and inventory needs

NOTES

Executive Operations Management Software

Operations management systems software and **manufacturing operations management** (**MOM**) systems applications for ESS focus on the processes involved in producing goods and services for sales. For a manufacturing firm, this would entail the processes involved in transitioning raw materials or intermediate products into sale-ready goods. The ESS software provides the executive with an overview of the manufacturing processes and provides the executive the capability to drill down into each specific step in the process. It also provides visibility on discrepancies, delays, or unexpected variations in the manufacturing process.

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Major Providers of Operations Management ESS Services

Major providers of this software include:

- SAP: with its business process management or BPM software
- Oracle: with its NetSuite software
- General Electric Digital: with its Predix Platform and ABB's Ability software
- QuickBooks Online (Advanced): focuses on the midsized and smaller company markets
- Workfront: offers a suite of program management

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Executive Financial Management Software

Financial management systems software allows executives to scan the internal and external environments for changes that might impact the firm's finances. This software allows managers to analyze all aspects of an organization's finances, including budgets, revenue, expenses, asset management, credit, debt, investments, and tax and accounting information. Financial management systems software provides visibility on all actionable issues that fall under the purview of the executive, allowing the executive to make necessary adjustments to maximize the operation's financial effectiveness.

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Major Providers

- Oracle: focused mainly on major corporate or governmental institution customers
- SAP: focused mainly on major corporate or governmental institution customers
- QuickBooks Online (Advanced): mainly for midsized and smaller firms
- Epicor: based in Austin, Texas
- Sage Group: based in the United Kingdom

NOTES

Executive Marketing Management Software

Executive marketing information systems assist senior managers by providing visibility over the numerous processes related to marketing management. These processes include:

- Gathering marketing data
- Storing the data
- Analyzing and distributing sales and marketing information to appropriate users

Marketing information system data include marketing research and environmental scanning, customer feedback, industry trends, and the advertising campaigns of competitors. It can be used to construct marketing models, assist senior managers with cost-benefit analyses, and gain better insight into an advertising campaign's return on investment for a business.

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Executive Human Resources Management Systems Software

Executive **human resources management** (**HRM**) systems provide executives with visibility over all areas of human resource management, including:

- Personnel requirements forecasting
- Recruiting
- Selection
- Hiring
- Evaluation
- Training
- Retention (reassignment, promotion, and grievance management)
- Scheduling and compensation (payroll and benefits administration)

Executive HRM systems provide an overview of the entire human resources management environment, highlight points where actual numbers vary from expected norms, and allow the executive to drill down into areas of interest.

NOTES

Major Providers

- Major providers such as SAP and Oracle provide comprehensive management information systems mainly for large organizations.
- Salesforce, though primarily known for its customer relationship management (CRM) systems, also offers HRM software for its users.
- Workday Inc., based in Pleasanton, California, offers a Cloud-based HRM system for both large and small corporations.

Smaller firms offer this software aimed at midsized and smaller companies and include:

- Zenefits, based in San Francisco, California
- BambooHR, based in Lindon, Utah
- APS Payroll, based in Shreveport, Louisiana

NOTES

Enterprise Resource Planning System Software

Enterprise resource planning (**ERP**) integrates the management of nearly all aspects of an organization, incorporating a suite of business applications in a unified system. Business applications supported and coordinated in an ERP include:

- Finance and accounting systems
- Human resource systems
- Production systems
- Logistics (supply chain management and inventory) systems
- Customer resource management systems
- Sales and marketing systems

Others may be included, depending on the type of organization.

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Elements of ERP System Software

Since enterprise resource planning software centralizes the key business applications of a corporation, it contains all the software required to manage every corporation's departments, including:

- Finances and accounting
- Human resources
- Operations and manufacturing
- Supply chain and inventory management systems
- Customer relationship management software

An ERP system requires a robust database analytics system that retrieves data from all applicable internal and external data warehouses and uses advanced modeling software to provide the required DSS, EIS, or BI system.

An ERP must have a user interface comprehensive enough to meet the needs of all departmental managers while being intuitive enough to satisfy senior executives.

The rapid adoption of ERP systems in many companies has resulted in information technology (IT) costs as the largest single category of expenses for U.S. businesses.

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Major Providers

Because of the development of Cloud-based ERP systems by firms like Microsoft, SAP, and Oracle, ERP systems are now available for smaller businesses that may not have been financially able to invest in large in-house IT systems. Cloud-based ERP systems are scalable to easily meet the needs of relatively small companies.

Other major competitors in the ERP systems market include Epicor, based in Austin, Texas, and the Sage Group, based in Newcastle-upon-Tyne, in the United Kingdom.

NOTES

Supply Chain Management System Software

Supply chain management (**SCM**) systems provide the software needed to ensure the efficient flow of goods and services from the initial extraction of raw materials all the way to customer distribution and receipt of payment. SCM helps to anticipate issues, such as increased demand or production slow-downs, and quickly institute accommodations.

An SCM has the ability to integrate status reports from multiple and varied logistics reporting apps on a single dashboard.

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The Elements of a SCM System

The components of a supply chain management system depend on the product provided. However, every SCM system has a basic set of components, which include:

- Supplier relationship management: product development, manufacturing, purchasing, and inventory processes
- Order fulfillment management: logistics and warehousing
- Customer relationship management: payment and demand management, customer service management, and returns management

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Functions of SCM Software

The primary function of a supply chain management system is to provide managers with increased visibility of the entire supply chain. Therefore, the user interface of any SCM remains a critical component.

SCM can also reduce the impact of the **bullwhip effect**, also known as the **Forrester effect**. This occurs when small variations in consumer demand create amplified demand variations in the supply chain. An efficient SCM system anticipates large increases or decreases in demand and adjusts accordingly, allowing each successive step in the chain to flex slightly rather than react abruptly.

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How SCM Software Feeds ERP Software

Many corporations integrate supply chain management software into an enterprise resource planning (ERP) suite of software. This is efficient because it ensures that most aspects of the firm's operations coordinate with each other. For example, hiring and training processes can be coordinated with procurement decisions and timing. If a company must bring in more employees for a specific event or season, they may also need to increase products. Hiring additional employees requires increased advertising, interviewing, on-boarding, and training, along with increased pay and accounting expenses. Using an ERP provides the entire management team with visibility on the status of each of these variables and highlights discrepancies or areas that need direct attention.

NOTES

Major Providers

There are a large number of supply chain management software providers:

SAP (Systems, Applications, and Products in Data Processing) is one of the largest suppliers of SCM. Based in Walldorf, Germany, it offers a stand-alone SCM application, but more often it is integrated with SAP's enterprise resource planning (ERP) system and often is Cloud based.

Oracle, based in Redwood City, California, sells SCM systems as part of its Oracle Fusion Applications (OFA) suite of business applications. It offers this as a part of a larger ERP, on the Cloud, and as an on-premise, user-hosted system.

Blue Yonder, based in Scottsdale, Arizona, is a major manufacturer of SCM and specializes in this software.

These are the top three (by revenue) SCM software providers, but there are over 100 other firms providing SCM systems.

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Customer Relationship Management Software

A **customer relationship management** (**CRM**) system seeks to manage a firm's interactions with customers by using analytics and data analysis to identify the most valuable customers and to target future customers. By tracking consumer behavior, it focuses on the customer experience to attract and retain customers.

A CRM system helps managers maintain the business's focus on the individual customer by developing a lasting relationship and encouraging strong relationships with suppliers and colleagues.

In many retail industries, CRM software is the most complex and expensive segment of a business management system. It integrates social media, customer support call center interactions, sales and returns, and even supply chain management. It begins by collecting customer information (email, telephone, and social media data) and combines this with information about the customer's buying habits to better anticipate customer desires.

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Functions of CRM Software

Most customer relationship management software helps to organize three main functions:

- Marketing: Incorporates the acquisition of potential marketing leads, segmenting the market, and targeting promotions, such as advertisements, to create a lasting relationship with customers
- Sales: Involves pricing, managing marketing lead contacts, and organizing sales activities
- Customer service: Encompasses responding to customers' questions, managing returns, and managing customer contacts to improve customer relationships

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Major Providers

CRM systems are often incorporated with other systems, such as inventory management systems, to streamline the entire enterprise.

Salesforce remains one of the largest suppliers of CRM software solutions and its software integrates with Oracle, QuickBooks, SAP, and other business management software. SAP includes embedded CRM modules in its enterprise resource planning software, as do Oracle (Commerce solutions), Adobe (Marketing Cloud), and Microsoft (Dynamics CRM).

Businesses such as HubSpot CRM, Zoho CRM, and Freshsales CRM focus primarily on meeting the customer relationship management requirements of smaller businesses.

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Design element: Vector abstract geometric background; -strizh-/Getty Images