CHAPTER 11

Information Systems within the Organization

1. Transaction Processing Systems
2. Functional Area Information Systems
3. Enterprise Resource Planning (ERP) Systems
4. ERP Support for Business Processes

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1. Explain the purpose of transaction processing systems.
2. Explain the types of support that information systems can provide for each functional area of the organization.
3. Identify advantages and drawbacks to businesses implementing an enterprise resource planning system.

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4. Describe the three main business processes supported by ERP systems.

OPENING >

- **A transaction is any business event that generates data worthy of being captured and stored in a database.**
- **Examples are a product manufactured, a service sold, a person hired, and a payroll check generated.**
- **A transaction processing system (TPS) supports the monitoring, collection, storage, and processing of data from the organization's basic business transactions, each of which generates data.**
- **The TPS collects data continuously, typically in real time—that is, as soon as the data are generated—and it provides the input data for the corporate databases.**
- **The TPSs are critical to the success of any enterprise because they support core operations.**

Transaction Processing Systems(TPS)

1. TPSs are inputs for the functional area information systems and business intelligence systems, as well as business operations such as customer relationship management, knowledge management, and e-commerce.

2. TPSs have to efficiently handle both high volumes of data and large variations in those volumes

3. They must avoid errors and downtime, record results accurately and securely, and maintain privacy and security

- A transaction processing system (TPS) supports the monitoring, collection, storage, and processing of data from the organization's basic business transactions, each of which generates data.
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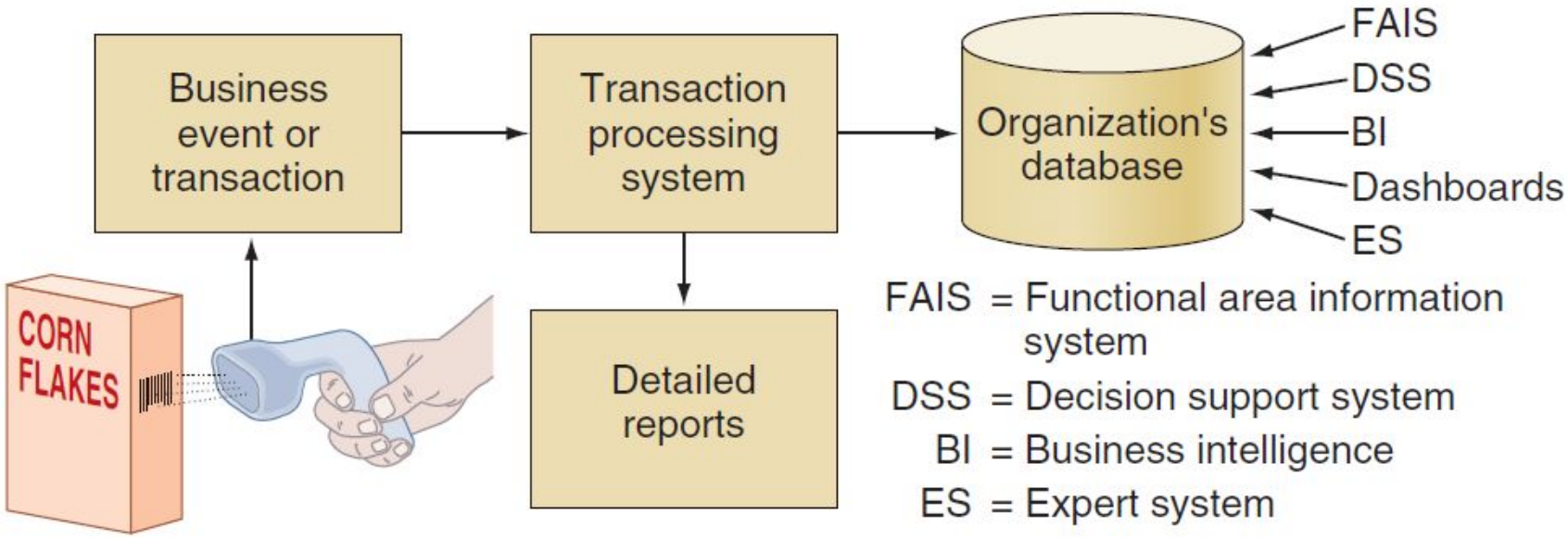
- The TPSs are critical to the success of any enterprise because they support core operations.
- In the modern business world, TPSs are inputs for the functional area information systems and business intelligence systems, as well as business operations such as customer relationship management, knowledge management, and e-commerce. TPSs have to efficiently handle both high volumes of data and large variations in those volumes (e.g., during

Figure 11.1: How TPS Manage Data

periods of peak processing). In addition, they must avoid errors and downtime, record results accurately and securely, and maintain privacy and security. Figure 10.1 illustrates how TPSs manage data.



TPSs manage the complexities of transactional data

- When more than one person or application program can access the database at the same time, the database has to be protected from errors resulting from overlapping updates. The most common error is losing the results of one of the updates.
- When processing a transaction involves more than one computer, the database and all users must be protected against inconsistencies arising from a failure of any component at any time.
- It must be possible to reverse a transaction in its entirety if it turns out to have been entered in error. It is also necessary to reverse a transaction when a purchased item is returned.
- It is frequently important to preserve an audit trail. In fact, for certain transactions an audit trail may be legally required.

Transaction: any business event that generates data worthy of being captured and stored in a database (e.g., product manufactured, a service sold, a person hired, and a payroll check generated)

Transaction Processing System (TPS): supports the monitoring, collection, storage, and processing of data from the organization's basic business transactions, each of which generates and collects data continuously, in real time.

Source Data Automation: a process in which organizations try to automate the TPS data entry as much as possible because of the large volume involved.

Batch Processing: the firm collects data from transactions as they occur, placing them in groups or batches then prepares and processes the batches periodically.

Online Transaction Processing (OLTP): business transactions are processed online as soon as they occur and system performs these tasks in real time by means of online technologies.

11.1 Transaction Processing Systems

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- Online Transaction Processing (OLTP) :business transactions are processed online as soon as they occur and system performs these tasks in real time by means of online technologies.

Functional Area Information Systems

1. Each department or functional area within an organization has its own collection of application programs, or information systems.
2. Each of these functional area information systems (FAISs) supports a particular functional area in the organization by increasing each area's internal efficiency and effectiveness.
3. FAISs often convey information in a variety of reports,

IS for Accounting and Finance

- **Financial Planning and Budgeting**:Appropriate management of financial assets and is an important part of managerial planning for both acquiring and utilizing resources.
- **Managing Financial Transactions**:accounting/finance software packages that are integrated with other functional areas (e.g., Peachtree offers a sales ledger, a purchase ledger, a cash book, sales order processing, invoicing, stock control, a fixed assets register, etc.). Organizations, business processes, and business activities operate with, and manage, financial transactions.
- **Investment Management**:Systems for managing organization investments in stocks, bonds, real estate, and other assets that are subject to complex regulations and tax laws, which vary from one location to another.
- **Control and Auditing**:effectively control their finances and financial statements.

Financial Planning and Budgeting

Appropriate management of financial assets and is an important part of managerial planning for both acquiring and utilizing resources.

- **Financial and economic forecasting**:Knowledge about the availability and cost of money a key ingredient for successful financial planning including flow projections which inform organizations what funds they need, when they need them, and how they will acquire them.

- **Budgeting**:allocates the organization's financial resources among participants and activities allowing management to distribute resources in the way that best supports the organization's mission and goals.

11.2 Functional Area Information Systems

- IS for Accounting and Finance
- IS for Marketing
- IS for Production/Operations Management
- IS for Human Resource Management
- Reports

Managing Financial Transactions

Accounting/finance software packages that are integrated with other functional areas (e.g., Peachtree offers a sales ledger, a purchase ledger, a cash book, sales order processing, invoicing, stock control, a fixed assets register, etc.). Organizations, business processes, and business activities operate with, and manage, financial transactions.

- Global stock exchanges
- Managing multiple currencies
- Virtual close
- Expense management automation (EMA)

Managing Financial Transactions

1. **Global stock exchanges:**Financial markets operate in global, 24/7/365, distributed electronic stock exchanges that use the Internet both to buy and sell stocks and to broadcast real-time stock prices
2. **Managing multiple currencies:**Financial and accounting systems utilize financial data from different countries to convert currencies (with conversion ratios that constantly flux) in seconds.
3. **Virtual close:** the ability the books(accounting records) quickly at any time, on very short notice (rather than quarterly) which provides almost real-time information on the organization's financial health.
4. **Expense management automation (EMA):** systems that automate the data entry and processing of travel and entertainment expenses through Web-based applications that enable companies to quickly and consistently collect expense information, enforce company policies and contracts, and reduce unplanned purchases as well as airline and hotel expenses.

Control and Auditing

- **Budgetary control:** managers at various levels monitor departmental expenditures and compare them against the budget and the operational progress of corporate plans.
- **Auditing**:monitoring how the organization's monies are being spent and assessing the organization's financial health.
- **Financial ratio analysis**:monitoring the company's financial health by assessing a set of financial ratios including liquidity ratios (the availability of cash to pay debt), activity ratios (how quickly a firm converts noncash assets to cash assets), debt ratios (measure the firm's ability to repay long-term debt), and profitability ratios (measure the firm's use of its assets and control of its expenses to generate an acceptable rate of return).

Information Systems for Marketing

Any successful organization must understand its customers' needs and wants and then develop its marketing and advertising strategies around them.

Information systems provide numerous types of support to the marketing function.

IS for Production/Operations Management (POM)

- In-House Logistics and Materials Management
- Inventory Management
- Quality Control
- Planning Production and Operations Management
- Computer-Integrated Manufacturing
- Product Lifecycle Management

IS for Human Resource Management

- **Recruitment**:systems that assist human resource personnel in finding potential employees, evaluating them, and deciding which ones to hire
- **Human Resources Development**:IS that assist human resource personnel in helping new hires become part of the corporate human resources pool through evaluation and development.
- **Human Resources Planning and Management:**Managing human resources in large organizations requires extensive planning and detailed strategy.

Three Areas of IT support in HR Planning and Management

1. Payroll and employee's records
2. Benefits administration
3. Employee relationship management

Functional Area Information

Accounting and Finance
Financial planning—and cost of money
Budgeting—allocates financial resources among participants and activities
Capital budgeting—financing of asset acquisitions
Managing financial transactions
Handling multiple currencies
Virtual close—the ability to close the books at any time on short notice
Investment management—managing organizational investments in stocks, bonds, real estate, and other investment vehicles
Budgetary control—monitoring expenditures and comparing them against the budget
Auditing—ensuring the accuracy of the organization's financial transactions and assessing the condition of the organization's financial health
Payroll

Marketing and Sales

Customer relations—know who customers are and treat them like royalty

Customer profiles and preferences

Sales force automation—using software to automate the business tasks of sales, thereby improving the productivity of salespeople

Quality control—controlling for defects in incoming material and defects in goods produced

Materials requirements planning—planning process that integrates production, purchasing, and inventory management of interdependent items (MRP)

Manufacturing resource planning—planning process that integrates an enterprise's production, inventory management, purchasing, financing, and labor activities (MRP II)

Just-in-time systems—a principle of production and inventory control in which materials and parts arrive precisely when and where needed for production (JIT)

Computer-integrated manufacturing—a manufacturing approach that integrates several computerized systems, such as computer-assisted design (CAD), computer-assisted manufacturing (CAM), MRP, and JIT

Product life cycle management—business strategy that enables manufacturers to collaborate on product design and development efforts, using the Web

Examples of information systems supporting the functional areas.

ACCOUNTING	FINANCE	HUMAN RESOURCES	PRODUCTION/ OPERATIONS	MARKETING	
Profitability Planning	Financial Planning	Employment Planning, Outsourcing	Product Life Cycle Management	Sales Forecasting, Advertising Planning	STRATEGIC
Auditing, Budgeting	Investment Management	Benefits Administration, Performance Evaluation	Quality Control, Inventory Management	Customer Relations, Sales Force Automation	TACTICAL
Payroll, Accounts Payable, Accounts Receivable	Manage Cash, Manage Financial Transactions	Maintain Employee Records	Order Fulfillment, Order Processing	Set Pricing, Profile Customers	OPERATIONAL

Reports

- Routine Reports:reports produced at scheduled intervals.
- Ad-hoc (On-Demand) Reports:out-of-the routine reports.
  - Drill-down reports:display a greater level of detail.
  - Key indicator reports:summarize the performance of critical activities.
  - Comparative reports:compare and contrast the performances of different business units or of a single unit during different time periods.
  - Exception reports:include only information that falls outside certain threshold standards.

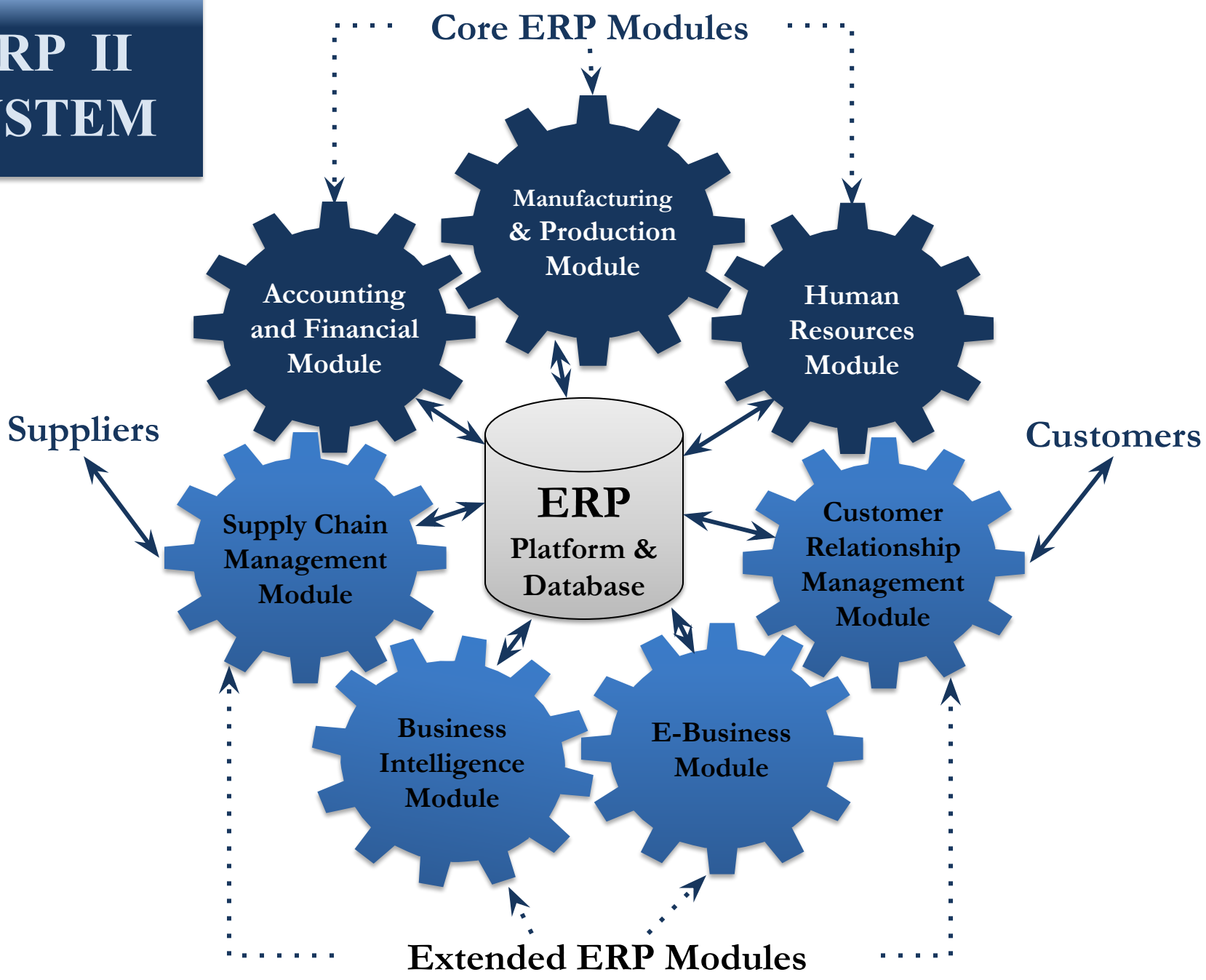
11.3 Enterprise Resource Planning (ERP) Systems

Systems designed to correct a lack of communication among the functional area IS and they adopt a business process view of the overall organization to integrate the planning, management, and use of all of an organization's resources, employing a common software platform and database.

- ERP II Systems: interorganizational ERP systems that provide Web-enabled links among a company's key business systems—such as inventory and production—and its customers, suppliers, distributors, and other relevant parties.
- Benefits and Limitations of ERP Systems
- Implementing ERP Systems
- Enterprise Application Integration:integrates existing systems by providing software, called middleware, that connects multiple applications allowing existing applications to communicate and share data

1. ERP II systems are interorganizational ERP systems that provide Web-enabled links among a company's key business systems—such as inventory and production—and its customers, suppliers, distributors, and other relevant parties
2. These links integrate internal-facing ERP applications with the external-focused applications of supply chain management and customer relationship management

ERP II SYSTEM



ERP Systems: Benefits

- Organizational Flexibility and Agility:ERP systems break down many former departmental and functional silos of business processes, information systems, and information resources. In this way, they make organizations more flexible, agile, and adaptive. The organizations can therefore respond quickly to changing business conditions and capitalize on new business opportunities
- Decision Support:Quality and Efficiency:ERP systems provide essential information on business performance across functional areas. This information signifi cantly improves managers' ability to make better, more timely decisions.
- Quality and effi ciency. ERP systems integrate and improve an organization's business processes, generating signifi cant improvements in the quality of production, distribution, and customer service.

ERP Systems: Limitations

- Business Processes Predefined by Best Practices
- Difficult to Implement:ERP systems can be extremely complex, expensive, and time-consuming to implement. In fact, the costs and risks of failure in implementing a new ERP system are substantial. Large losses in revenue, profits,and market share have resulted when core business processes and information systems failed or did not work properly. In many cases, orders and shipments were lost, inventory changes
- Potential for Failure:

Major Causes of ERP Implementation Failure

- Failure to involve affected employees in planning and development
- Attempting too much too fast
- Insufficient training
- Failure to perform proper data conversion and testing

Implementing ERP Systems

- On-Premise ERP Implementation
- Software-as-a-Service (SaaS) ERP Implementation

On-Premise ERP Implementation

- Vanilla Approach
- Custom Approach
- Best of Breed Approach

Vanilla Approach

1. In this approach, a company implements a standard ERP package,using the package's built-in configuration options. When the system is implemented in this way, it will deviate only minimally from the package's standardized settings.
2. The vanilla approach can make the implementation quicker, but the extent to which the software is adapted to the organization's specifi c processes is limited.
3. Fortunately, a vanilla implementation provides general functions that can support the fi rm's common business processes with relative ease, even if they are not a perfect fi t for those processes

Custom Approach

1. In this approach, a company implements a more customized ERP system by developing new ERP functions designed specifically for that firm.
2. Decisions concerning the ERP's degree of customization are specific to each organization.
3. To utilize the custom approach, the organization must carefully analyze its existing business processes to develop a system that conforms to the organizations particular characteristics and processes.
4. In addition, customization is expensive and risky because computer code must be written and updated every time a new version of the ERP software is released.
5. Going further, if the customization does not perfectly match the organization's needs, then the system can be
6. very diffi cult to use

The best of breed approach

1. This approach combines the benefits of the vanilla and customized systems while avoiding the extensive costs and risks associated with complete customization.
2. Companies that adopt this approach mix and match core ERP modules as well as other extended ERP modules from different software providers to best fit their unique internal processes and value chains.
3. Thus, a company may choose several core ERP modules from an established vendor to take advantage of industry best practices—for example, for fi nancial management and human resource management.
4. At the same time, it may also choose specialized software to support its unique business processes—for example, for manufacturing, warehousing and distribution.
5. Sometimes companies arrive at the best of breed approach the hard way.
6. For example, Dell wasted millions of dollars trying to customize an integrated ERP system from a major vendor to match its unique processes before it realized that a smaller, more flexible system that integrated well with other corporate applications was the answer.

Software-as-a-Service ERP Implementation.

1. Companies can acquire ERP systems without having to buy a complete software solution (i.e., on-premise ERP implementation).
2. In this business model, the company rents the software from an ERP vendor who offers its products over the Internet using the SaaS model.
3. The ERP cloud vendor manages software updates and is responsible for the system's security and availability.
4. Cloud-based ERP systems can be a perfect fi t for some companies. For instance, companies that cannot afford to make large investments in IT, yet which already have relatively structured business processes that need to be tightly integrated, might benefi t from cloud computing.
5. The relationship between the company and the cloud vendor is regulated by contracts and by service level agreements (SLAs)

Three major advantages of using a cloud-based ERP system are:

1. The system can be used from any location that provides Internet access. Consequently, users can work from any location using online shared and centralized resources (data and databases).
2. Companies using cloud-based ERP avoid the initial hardware and software expenses that are typical of on-premise implementations
3. Cloud-based ERP solutions are scalable, meaning it is possible to extend ERP support to new business processes and new business partners (e.g., suppliers) by purchasing new ERP modules.

Three main disadvantages of using a cloud-based ERP system are:

1. It is not clear whether cloud-based ERP systems are more secure than on-premise systems.
2. In fact, a 2012 survey conducted by North Bridge Venture Partners indicated that security
3. was the primary reason why organizations did not adopt cloud-based ERP

’S ABOUT BUSINESS 11.1

- **GEA Group Uses SAP for Financial Reporting**
  1. Discuss the reasons why financial reports must be timely.
  2. Explain how SAP enabled the GEA Group to produce their financial reports in an efficient, timely manner.
  3. What are the advantages of the SAP solution to the GEA Group?

11.4 ERP Support for Business Processes

- The Procurement, Fulfillment, and Production Processes
- Interorganizational Processes: ERP with SCM and CRM

The Procurement, Fulfillment, and Production Processes

- Procurement Process:originates when a company needs to acquire goods or services from external sources, and it concludes when the company receives and pays for them
- Order Fulfillment Process:(order-to-cash process) process in which the company sells goods to a customer originating when the company receives a customer order, and concluding when the company receives a payment from the customer.
- Production Process: occurring only in companies that produce physical goods, this process follows one of two strategies: make-to-stock and make-to-order.

Figure 11.4: Departments & Documents Flow in Procurement

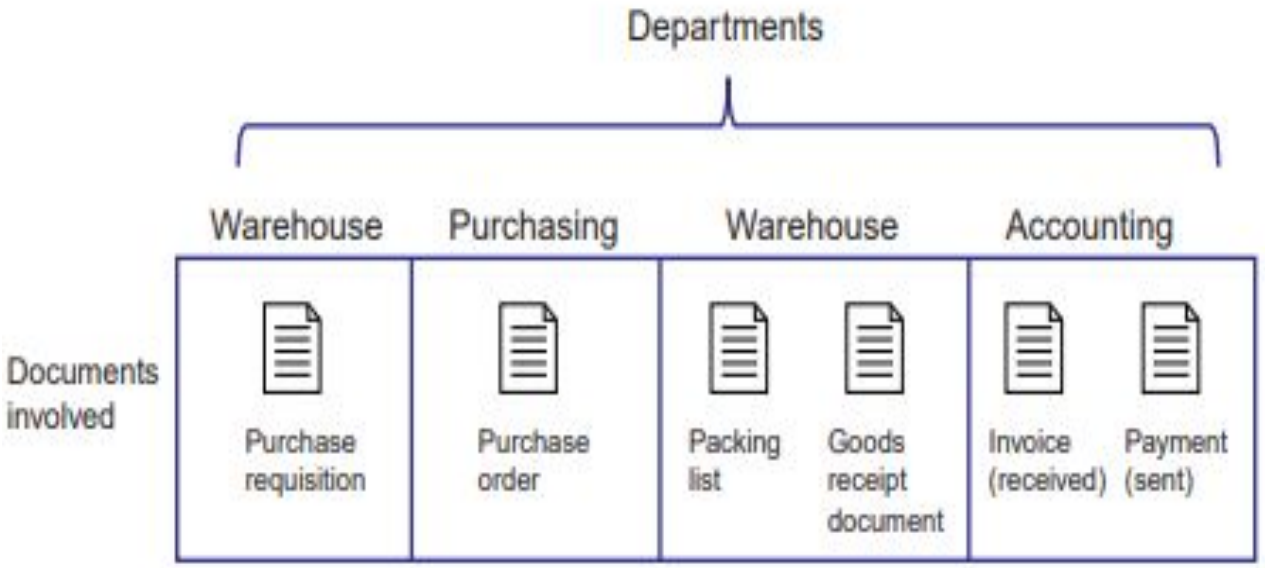


FIGURE 10.4 Departments and documents flow in the procurement process.

Figure 11.5: Departments & Documents Flow in Fulfillment

FIGURE 10.5 Departments and documents flow in the fulfillment process.

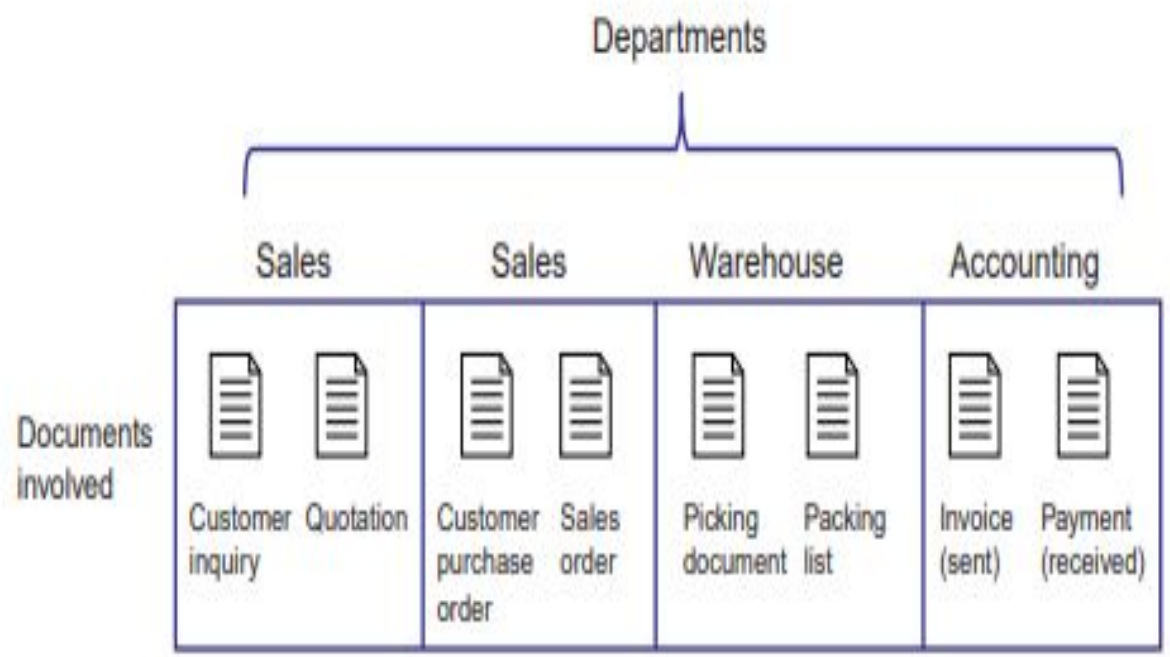


Figure 11.6: Departments & Documents Flow in Production

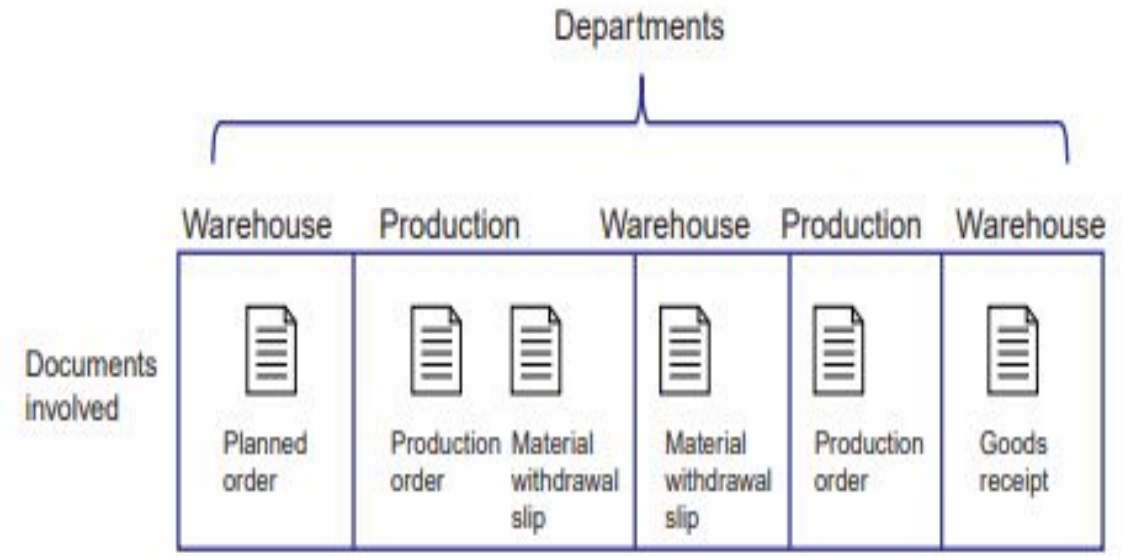
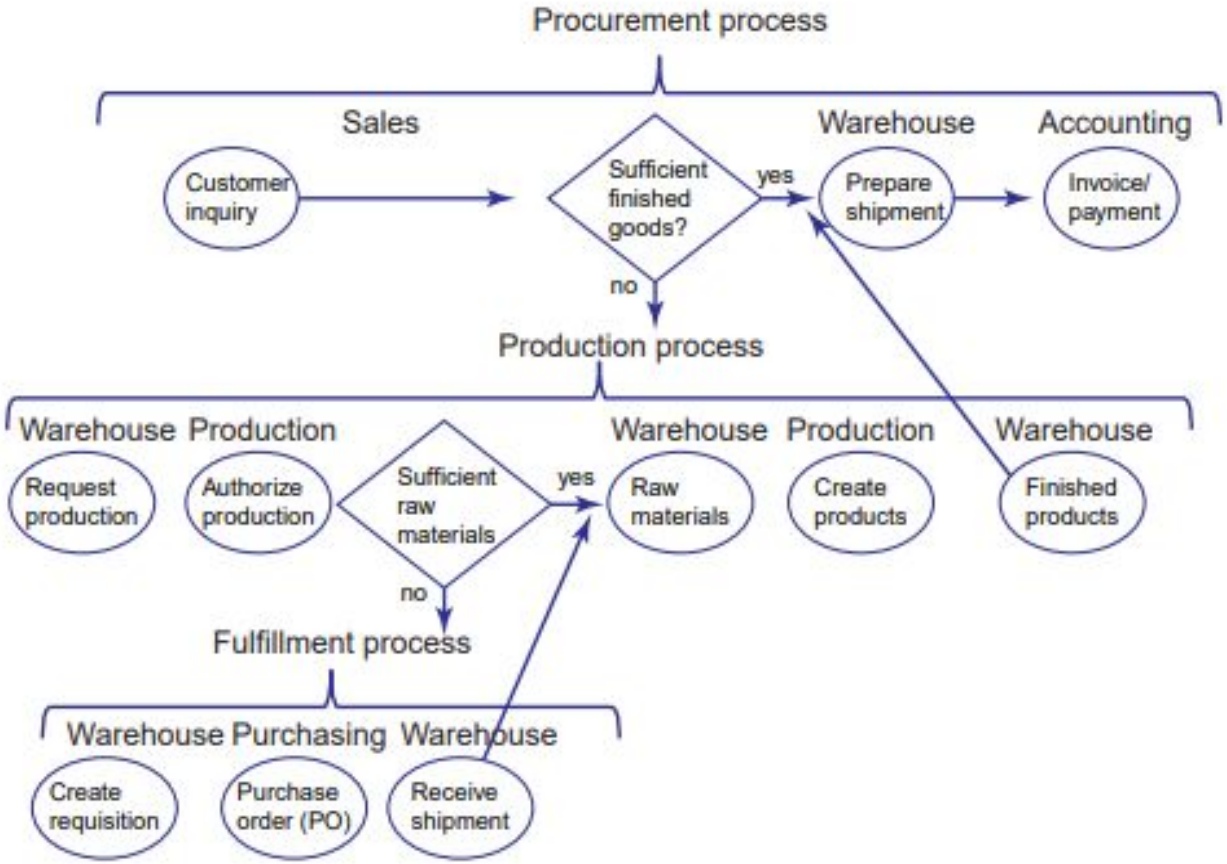


FIGURE 10.6 Departments and documents flow in the production process.

Figure 11.7: Integrated Processes with ERP Systems

FIGURE 10.7 Integrated processes with ERP systems.



Interorganizational Processes: ERP with SCM and CRM(help multiple firms in an industry coordinate activities such as the production-to-sale of goods and services.

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- Enterprise Resource Planning (ERP) Supply Chain Management (SCM) Systems:have the capability to place automatic requests to replinish raw materials/goods based on established criteria (e.g., below minimum quantity, expiration dates on perishable goods, etc.)
- Enterprise Resource Planning (ERP) Customer Relationship Management (CRM) Systems:generate forecasting analyses of product consumption based on critical variables such as geographical area, season, day of the week, and type of customer; and, identify particular customer needs and then utilize this information to suggest specific product campaigns.