Chapter 5
Electronic and Mobile Commerce and Enterprise Systems
Principles and Learning Objectives

• Electronic commerce and mobile commerce are evolving, providing new ways of conducting business that present both opportunities for improvement and potential problems
  – Describe the current status of various forms of e-commerce, including B2B, B2C, C2C, and m-commerce
  – Identify several e-commerce and m-commerce applications
  – Identify several advantages associated with the use of e-commerce and m-commerce
Principles and Learning Objectives (continued)

• E-commerce and m-commerce require the careful planning and integration of a number of technology infrastructure components
  – Identify the key components of technology infrastructure that must be in place for e-commerce and m-commerce to work
  – Discuss the key features of the electronic payment systems needed to support e-commerce and m-commerce.
Principles and Learning Objectives (continued)

- An organization must have information systems that support the routine, day-today activities that occur in the normal course of business and help a company add value to its products and services
  - Identify the basic activities and business objectives common to all transaction processing systems
  - Identify key control and management issues associated with transaction processing systems
Principles and Learning Objectives (continued)

• A company that implements an enterprise resource planning system is creating a highly integrated set of systems, which can lead to many business benefits
  – Discuss the advantages and disadvantages associated with the implementation of an enterprise resource planning system
  – Identify the challenges multinational corporations must face in planning, building, and operating their TPSs
An Introduction to Electronic Commerce

• Electronic commerce
  – Conducting business activities electronically over computer networks such as the Internet, extranets, and corporate networks

• Business activities that are strong candidates for conversion to e-commerce:
  – Paper-based
  – Time-consuming
  – Inconvenient for customers
Business-to-Business (B2B) E-Commerce

- A subset of e-commerce where all the participants are organizations
- Useful tool for connecting business partners in a virtual supply chain to cut resupply times and reduce costs
Business-to-Consumer (B2C) E-Commerce

- Business-to-consumer (B2C) e-commerce
  - Businesses sell their products directly to consumers
- Elimination of intermediaries
  - Squeezes costs and inefficiencies out of supply chain
  - Can lead to higher profits for companies and lower prices for consumers
Consumer-to-Consumer (C2C) E-Commerce

• Consumer-to-consumer (C2C) e-commerce
  – Consumers sell directly to other consumers
  – Example: eBay
eGovernment

• Use of information and communications technology to:
  – Simplify the sharing of information
  – Speed formerly paper-based processes
  – Improve the relationship between citizen and government

• Forms of eGovernment
  – Government-to-consumer (G2C)
  – Government-to-business (G2B)
  – Government-to-government (G2G)
Mobile Commerce

• Relies on the use of wireless devices, such as personal digital assistants, cell phones, and smartphones, to place orders and conduct business
Mobile Commerce in Perspective

• Market for m-commerce in North America is maturing much later than in Western Europe and Japan

• Japanese consumers
  – Generally enthusiastic about new technology
  – Much more likely to use mobile technologies for making purchases
Electronic and Mobile Commerce Applications

• Retail and wholesale
  – Electronic retailing (e-tailing)
    • Direct sale from business to consumer through electronic storefronts
  – Cybermall
    • Single Web site that offers many products and services at one Internet location
Manufacturing

• Electronic exchange
  – Electronic forum where manufacturers, suppliers, and competitors buy and sell goods, trade market information, and run back-office operations

• Private exchanges
  – Owned and operated by a single company

• Public exchanges
  – Owned and operated by industry groups
Manufacturing (continued)

Figure 5.1
Model of an Electronic Exchange
Marketing

• Market segmentation
  – The identification of specific markets to target them with advertising messages

• Technology-enabled relationship management
  – Use of detailed information about a customer’s behavior, preferences, needs, and buying patterns to set prices, negotiate terms, tailor promotions, and add product features
Investment and Finance

• The brokerage business
  – Adapted to the Internet faster than any other arm of finance

• Electronic bill presentment
  – Vendor posts an image of your statement on the Internet and alerts you by e-mail that your bill has arrived
Online Real Estate Services

• Redfin
  – Online real estate company that provides both online real estate search capabilities and access to live agents
  – Pays bonuses to agents when they receive high customer satisfaction ratings
Auctions

• Popular online auction Web sites
  – eBay, Craigslist, uBid, Auctions, Onsale
• English auction
  – Initial price starts low and is bid up by successive bidders
• Reverse auction
  – Sellers compete to obtain business by submitting successively lower prices for their goods or services
Anywhere, Anytime Applications of Mobile Commerce

- Mobile banking
  - Consumers can manage their finances from anywhere
- Mobile price comparison
  - Encourages shoppers to do Web-based price comparisons while they are in stores
Anywhere, Anytime Applications of Mobile Commerce (continued)

• Mobile advertising
  – 58 million U.S. wireless subscribers viewed an ad on their cell phones in February 2008

• Mobile coupons
  – About two percent of advertisers surveyed by Jupiter Research are using mobile coupons
Advantages of Electronic and Mobile Commerce

• Conversion to an e-commerce or m-commerce system enables organizations to:
  – Reduce the cost of doing business
  – Speed the flow of goods and information
  – Increase the accuracy of order processing and order fulfillment
  – Improve the level of customer service
Advantages of Electronic and Mobile Commerce (continued)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides global reach</td>
<td>Allows manufacturers to buy at a low cost worldwide and offers enterprises the chance to sell to a global market right from the very start-up of their business.</td>
</tr>
<tr>
<td>Reduces costs</td>
<td>Eliminates time-consuming and labor-intensive steps throughout the order and delivery process so that more sales can be completed in the same period and with increased accuracy.</td>
</tr>
<tr>
<td>Speeds flow of goods and information</td>
<td>The flow of information is accelerated because of the established electronic connections and communications processes.</td>
</tr>
<tr>
<td>Increased accuracy</td>
<td>Enables buyers to enter their own product specifications and order information directly so that human data-entry error is eliminated.</td>
</tr>
<tr>
<td>Improves customer service</td>
<td>Increased and more detailed information about delivery dates and current status increases customer loyalty.</td>
</tr>
</tbody>
</table>

Table 5.1
Advantages of Electronic and Mobile Commerce
Technology Infrastructure Required to Support E-Commerce and M-Commerce

• Successful implementation of e-business requires:
  – Significant changes to existing business processes
  – Substantial investment in IS technology

• Poor Web site performance
  – Drives consumers to abandon some e-commerce sites
Technology Infrastructure Required to Support E-Commerce and M-Commerce (continued)

Figure 5.2

Key Technology Infrastructure Components
Hardware

- Storage capacity and computing power required of the Web server depends on:
  - Software that will run on the server
  - Volume of e-commerce transactions
Web Server Software

• Security and identification
  – Essential for intranet Web servers to identify and verify employees accessing the system

• Web site development
  – Include features such as an HTML/visual Web page editor

• Web page construction
  – Static and dynamic Web pages
E-Commerce Software

- Catalog Management
- Product Configuration
- Shopping Cart
- Web Services
Technology Needed for Mobile Commerce

• Security is a major concern in two areas
  – The security of the transmission itself
  – The trust that the transaction is being made with the intended party

• Encryption
  – Can provide secure transmission

• Digital certificates
  – Can ensure that transactions are made between the intended parties
Electronic Payment Systems

- **Certificate authority (CA)**
  - Trusted third-party organization or company that issues digital certificates
- **Secure Sockets Layer (SSL)**
  - Used to secure sensitive data
- **Electronic cash**
  - Money that is computerized, stored, and used as cash for e-commerce transactions
Electronic Payment Systems (continued)

- Credit, charge, debit, and smart cards
  - Used for most of Internet purchases
- Payments using cell phones
  - Retail and banking industries are keenly interested in using a cell phone like a credit card
### Electronic Payment Systems (continued)

<table>
<thead>
<tr>
<th>Payment System</th>
<th>Description</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit card</td>
<td>Carries preset spending limit based on the user’s credit history.</td>
<td>Each month the user can pay part or all of the amount owed.</td>
<td>Unpaid balance accumulates interest charges—often at a high rate of interest.</td>
</tr>
<tr>
<td>Charge card</td>
<td>Looks like a credit card but carries no preset spending limit.</td>
<td>Charge cards do not involve lines of credit and do not accumulate interest charges.</td>
<td>The entire amount charged to the card is due at the end of the billing period.</td>
</tr>
<tr>
<td>Debit card</td>
<td>Look like a credit cards or automated teller machine (ATM) cards.</td>
<td>Operates like cash or a personal check</td>
<td>Money is immediately deducted from user’s account balance.</td>
</tr>
<tr>
<td>Smart card</td>
<td>Credit card device with embedded microchip capable of storing facts about card holder</td>
<td>Better protected from misuse than conventional credit, charge, and debit cards because the smart-card information is encrypted</td>
<td>Not widely used in the U.S.</td>
</tr>
</tbody>
</table>

*Table 5.2*

- **Enterprise system**
  - Ensures information can be shared across all business functions and all levels of management

- **Transaction processing systems**
  - Capture and process the detailed data necessary to update records about the fundamental business operations of the organization
Traditional Transaction Processing Methods and Objectives

• Batch processing system
  – Business transactions are accumulated over a period of time and prepared for processing as a single unit or batch

• Online transaction processing (OLTP)
  – Each transaction is processed immediately, without the delay of accumulating transactions into a batch
Traditional Transaction Processing
Methods and Objectives (continued)

(a) Batch Processing
Batch Versus Online Transaction Processing
(a) Batch processing inputs and processes data in groups. (b) In online processing, transactions are completed as they occur.

(b) Online Transaction Processing
Traditional Transaction Processing
Methods and Objectives (continued)

Figure 5.6
Integration of a Firm's TPSs
Transaction Processing Activities

- TPSs
  - Capture and process data that describes fundamental business transactions

- Transaction processing cycle
  - Process of data collection, data editing, data correction, data manipulation, data storage, and document production
Transaction Processing Activities (continued)

- Original data
  - Data collection
  - Data editing
    - Good data
    - Bad data
  - Data correction
  - Data manipulation
  - Data storage
  - TPS reports
  - Document production

**Figure 5.7**

Data-Processing Activities Common to Transaction Processing Systems
Data Collection

- Capturing and gathering data necessary to complete the processing of transactions
- Data should be:
  - Collected at source
  - Recorded accurately and in a timely fashion
Data Collection (continued)

**Figure 5.8**
Point-of-Sale Transaction Processing System
Data Editing

• The process of checking data for validity and completeness

• Example:
  – Quantity and cost data must be numeric and names must be alphabetic; otherwise, the data is not valid
Data Correction

• The process of reentering data that was not typed or scanned properly

• Example:
  – A scanned UPC code must match a code in a master table of valid UPCs
Data Manipulation

• The process of performing calculations and other data transformations related to business transactions

• Can include:
  – Classifying data
  – Sorting data into categories
  – Performing calculations
Data Storage

• The process of updating one or more databases with new transactions
• After being updated data can be further processed and manipulated by other systems
Document Production and Reports

• Document production
  – Generating output records and reports
• Printed paychecks
  – Hard-copy documents produced by a payroll TPS
Control and Management Issues

• Disaster recovery plan (DRP)
  – Formal plan describing the actions that must be taken to restore computer operations and services in the event of a disaster

• Critical business information systems
  – TPSs that directly affect the cash flow of the firm
Transaction Processing System Audit

• Attempts to answer four basic questions
  – Does the system meet the business need for which it was implemented?
  – What procedures and controls have been established?
  – Are these procedures and controls being used properly?
  – Are the information systems and procedures producing accurate and honest reports?
Traditional Transaction Processing Application

• A TPS typically includes the following types of systems
  – Order processing systems
  – Accounting systems
  – Purchasing systems
Transaction Processing Systems for Small and Medium Size Enterprises (SMES)

- Many software packages
  - Provide integrated transaction processing system solutions for small and medium size enterprises (SMEs)
## Transaction Processing Systems for Small and Medium Size Enterprises (SMES) (continued)

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Software</th>
<th>Type of TPS Offered</th>
<th>Target Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccuFund</td>
<td>AccuFund</td>
<td>Financial reporting and accounting</td>
<td>Non-profit, municipal and government organizations</td>
</tr>
<tr>
<td>OpenPro</td>
<td>OpenPro</td>
<td>Complete ERP solution including financials, supply chain management, e-commerce, customer relationship management, and retail POS system</td>
<td>Manufacturers, distributors, and retailers</td>
</tr>
<tr>
<td>Intuit</td>
<td>QuickBooks</td>
<td>Financial reporting and accounting</td>
<td>Manufacturers, professional services, contractors, nonprofits, and retailers</td>
</tr>
<tr>
<td>Sage</td>
<td>Timberline</td>
<td>Financial reporting, accounting, and operations</td>
<td>Contractors, real estate developers, and residential builders</td>
</tr>
<tr>
<td>Redwing</td>
<td>TurningPoint</td>
<td>Financial reporting and accounting</td>
<td>Professional services, banks, and retailers</td>
</tr>
</tbody>
</table>

*Table 5.3*

Sample of Integrated TPS Solutions for SMEs
Enterprise Resource Planning, Supply Chain Management, and Customer Relationship Management

• Business process
  – Set of coordinated and related activities that takes one or more kinds of input and creates an output of value to the customer of that process

• At the core of the ERP system
  – A database shared by all users
Enterprise Resource Planning, Supply Chain Management, and Customer Relationship Management (continued)

Figure 5.9
Enterprise Resource Planning System
An ERP integrates business processes and the ERP database.
An Overview of Enterprise Resource Planning

• ERP systems
  – Evolved from materials requirement planning systems (MRP)
• First to take on the challenge of implementing ERP
  – Large organizations; members of the Fortune 1000
Advantages of ERP

- Improved access to data for operational decision making
- Elimination of costly, inflexible legacy systems
- Improvement of work processes
- Upgrade of technology infrastructure
Disadvantages of ERP Systems

- Expense and time in implementation
- Difficulty implementing change
- Difficulty integrating with other systems
- Risks in using one vendor
- Risk of implementation failure
ERP for Small and Medium Size Enterprises (SMEs)

• SMEs
  – Can achieve real business benefits from their ERP efforts
• With open-source software anyone can see and modify the source code to customize it to meet their needs
ERP for Small and Medium Size Enterprises (SMEs) (continued)

<table>
<thead>
<tr>
<th>Vendor</th>
<th>ERP Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>Open For Business ERP</td>
</tr>
<tr>
<td>Compiere</td>
<td>Compiere Open Source ERP</td>
</tr>
<tr>
<td>Openbravo</td>
<td>Openbravo Open Source ERP</td>
</tr>
<tr>
<td>WebERP</td>
<td>WebERP</td>
</tr>
</tbody>
</table>

**Table 5.4**

Open Source ERP Systems
Production and Supply Chain Management

• ERP systems follow a systematic process for developing a production plan
  – Sales forecasting
  – Sales and operations plan
  – Demand management
  – Detailed scheduling
  – Materials requirement planning
  – Purchasing
  – Production
Customer Relationship Management and Sales Ordering

• Goals of CRM:
  – Understand and anticipate the needs of current and potential customers to increase customer retention and loyalty
  – Optimize the way products and services are sold

• Sales ordering
  – Set of activities that must be performed to capture a customer sales order
Customer Relationship Management and Sales Ordering (continued)

Figure 5.10
Customer Relationship Management System
Financial and Managerial Accounting

• Financial accounting
  – Capturing and recording all transactions that affect a company’s financial state

• Managerial accounting
  – Provides data to enable the firm’s managers to:
    • Assess the profitability of a given product
    • Identify underperforming sales regions
    • Establish budgets
    • Make profit forecasts
Hosted Software Model for Enterprise Software

• Goal:
  – To help customers acquire, use, and benefit from the new technology while avoiding much of the associated complexity and high start-up costs
• Potential problems can occur if the hosted software vendor cannot provide a reliable operation environment
Hosted Software Model for Enterprise Software (continued)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased total cost of ownership</td>
<td>Potential availability and reliability issues</td>
</tr>
<tr>
<td>Faster system startup</td>
<td>Potential data security issues</td>
</tr>
<tr>
<td>Lower implementation risk</td>
<td>Potential problems integrating the hosted products of different vendors</td>
</tr>
<tr>
<td>Management of systems outsourced to experts</td>
<td>Savings anticipated from outsourcing may be offset by increased effort to manage vendor</td>
</tr>
</tbody>
</table>

Table 5.5
Advantages and Disadvantages of Hosted Software Model
International Issues Associated with Enterprise Systems

• Challenges that must be met by an enterprise system of a multinational company
  – Different languages and cultures
  – Disparities in IS infrastructure
  – Varying laws and customs rules
  – Multiple currencies
Summary

• E-commerce
  – Business-to-business (B2B)
  – Business-to-consumer (B2C)
  – Consumer-to-consumer (C2C)
  – Mobile commerce

• Wireless Application Protocol (WAP)
  – Standard set of specifications to enable development of m-commerce software for wireless devices
Summary (continued)

• Electronic payment systems
  – Key component of the e-commerce infrastructure

• Transaction processing systems (TPSs)
  – The heart of most information systems in businesses today

• Basic activities of TPSs
  – Data collection, data editing
  – Data correction, data manipulation
  – Sorting, categorizing, summarizing
  – Data storage and document production
Summary (continued)

• Enterprise resource planning (ERP)
  – Software that integrates activities throughout a business

• Many SMEs have found open source ERP systems to be effective solutions to their transaction processing and management reporting needs

• Production and supply chain management process
  – Starts with sales forecasting