E-Commerce and Transaction Processing Systems

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Learning Objectives

• Outline the key components of technology infrastructure that must be in place for e-commerce to succeed.
• Discuss the key features of the electronic payments systems needed to support e-commerce.
• Identify the major issues that represent significant threats to the continued growth of e-commerce.
Learning Objectives

• Identify the basic activities and business objectives common to all transaction processing systems.

• Discuss the importance of business resumption planning and disaster recovery for key transaction processing systems.
Learning Objectives

• Define the term enterprise resource planning system and discuss the advantages and disadvantages associated with the implementation of such a system.
Introduction to Electronic Commerce
E-Commerce

• Business-to-consumer
  – Example: Bookstore selling books to customers (amazon.com)
  – Annual online spending in 2002 was $85 billion

• Business-to-business
  – Example: A data processing company handling data services for a company (adp.com)
  – $5.3 trillion impact by 2005

• Consumer-to-consumer
  – Example: A customer selling goods to another customer (e-bay.com)
Why Use E-Commerce?

• Cut transaction costs
• Speed flow of goods and information
• Improve customer service
• Coordinate manufacturers, suppliers, and customers
Supply Chain Management

Demand Planning
- Analyzing buying patterns
- Developing customer demand forecasts

Supply Planning
- Strategic planning
- Inventory planning
- Distribution planning
- Procurement planning
- Transportation planning
- Supply allocation

Demand Fulfillment
- Order fulfillment
- Backlog management
- Order promising
- Customer verification
- Order capture
Value Chains in E-Commerce

• Conversion to e-commerce supply chain management provides businesses with an opportunity to:

  – increase revenues or decrease costs by eliminating time-consuming and labor-intensive steps throughout the order and delivery process
  – improve customer satisfaction by enabling customers to view detailed information about delivery dates and order status
  – reduce inventory including raw materials, safety stocks, and finished goods
Product and Information Flow for HP Printers Ordered Over the Web
E-Commerce Applications
E-Commerce Applications

- Retail and Wholesale: www.estore.com.tr/
- Manufacturing: www.covisint.com/
- Marketing: www.doubleclick.com
- Investment and Finance: www.garanti.com.tr/
- Auctions: www.gittigidiyor.com
- Price comparison: www.google.com/froogle
Retail and Wholesale

- **Electronic retailing** - the direct sale from business to consumer through electronic storefronts

- **Cybermall** - a single Web site that offers many products and services at one Internet location
Model of an Electronic Exchange

- Manufacturers
  - Information about raw material needs, purchase orders, shipment notices, payment requests
  - Customer orders, supplier shipment notices

- Electronic Exchange
  - Requests for information, purchase orders, payment information
  - Manufacturers' orders, information about raw material needs
  - Shipment notices for manufacturers, payment requests

- Shoppers
  - Payment request
  - Payment approval, electronic transfer of funds

- Supplier's Bank
  - Payment request

- Shopper's Bank
  - Payment approval, electronic transfer of funds

- Manufacturer's Bank
# Web Sites Useful to Investors

<table>
<thead>
<tr>
<th>Name of Site</th>
<th>URL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>411 Stocks</td>
<td><a href="http://www.411.stocks.com">www.411.stocks.com</a></td>
<td>One-stop location to get lots of information about a stock—price data, news, discussion groups, charts, basic data, financial statements, and delayed quotes</td>
</tr>
<tr>
<td>MarketReporter</td>
<td><a href="http://www.marketreporter.com">www.marketreporter.com</a></td>
<td>Provides financial news, recommendations, upgrades, downgrades, message boards, stock market simulation game</td>
</tr>
<tr>
<td>Thomson Investors Network</td>
<td><a href="http://www.thomsoninvest.com">www.thomsoninvest.com</a></td>
<td>Financial commentary from a number of stock market publications, including <em>First Watch</em> and <em>Stocks to Watch</em></td>
</tr>
<tr>
<td>Elite Trader</td>
<td><a href="http://www.elitetrader.com">www.elitetrader.com</a></td>
<td>Virtual gathering place for day traders with bulletin boards and chat rooms</td>
</tr>
<tr>
<td>Dayinvestor.com</td>
<td><a href="http://www.dayinvestor.com">www.dayinvestor.com</a></td>
<td>News and stock alerts with frequent briefs on market activity and rumors</td>
</tr>
<tr>
<td>DRIP Advisor</td>
<td><a href="http://www.dripadvisor.com">www.dripadvisor.com</a></td>
<td>Covers the basics of dividend reinvestment programs (DRIPs), what companies offer DRIPs, and how to start a DRIP</td>
</tr>
<tr>
<td>The Raging Bull</td>
<td>ragingbull.lycos.com</td>
<td>Contains lots of message boards; guest experts produce news, commentary, and analysis</td>
</tr>
<tr>
<td>EDGAR Online</td>
<td><a href="http://www.edgar-online.com">www.edgar-online.com</a></td>
<td>Provides access to company filings with the Securities and Exchange Commission (SEC)</td>
</tr>
<tr>
<td>Federal Filings Online</td>
<td><a href="http://www.fedfil.com">www.fedfil.com</a></td>
<td>Dow Jones directory of documents filed with the federal government, including bankruptcy proceedings, initial public offering (IPO) filings, SEC reports, and court cases</td>
</tr>
</tbody>
</table>
### Popular Stock Tracker Web Sites

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<tr>
<th>Name of the Web Stock Tracker Site</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSN MoneyCentral</td>
<td>moneycentral.msn.com/investor</td>
</tr>
<tr>
<td>Quicken.com</td>
<td><a href="http://www.quicken.com">www.quicken.com</a></td>
</tr>
<tr>
<td>The Motley Fool</td>
<td><a href="http://www.fool.com">www.fool.com</a></td>
</tr>
<tr>
<td>Yahoo!</td>
<td>quote.yahoo.com</td>
</tr>
<tr>
<td>Morningstar</td>
<td><a href="http://www.morningstar.com">www.morningstar.com</a></td>
</tr>
</tbody>
</table>
Technology, Infrastructure, and Development
Key E-Commerce Technical Components

- Network
- Internet
- Value-added network
- Virtual private network

- High-speed connection to network

- E-commerce software

- Server software

- Server operating system

- Web server hardware
Hardware

• The amount of storage capacity and computing power required of the Web server depends primarily on two things:
  
  – the software that must run on the server
  – the volume of e-commerce transactions that must be processed
Software (1)

• Web server software
  – Apache Server
  – Microsoft Internet Information Server
• Web site development tools
  – FrontPage, NetStudio
• Web page construction software
  – Static Web page: Always the same information (ISE 100 Web page)
  – Dynamic Web page: Content created based on demand (Google search results)
Software (2)

• Database management system
  – SQL Server
  – Oracle

• E-commerce software
  – Catalog software
  – Product configuration software
  – Electronic shopping cart
Catalog Management Software

- Combines product data formats into a standard format
- Creates a central repository of product data
- Catalog resides on a database
- Amazon’s book, music catalog
Product Configuration Software

• Allow buyers to build the products they want to buy
• www.dell.com lets you choose parts of the computer separately
• Better customization, better sales
Electronic Shopping Cart

- Track items selected for purchase
- Let buyers modify their choices (add or delete items)
- Let buyers “checkout” (begins a purchase transaction)
- Wish list
Electronic Shopping Cart
Electronic Payment Systems

• Electronic cash
  – Money that is “computerized”
  – Used as cash in e-commerce transactions
• Electronic wallets
  – Holds credit card, e-cash, address information
  – Automatically handles checkout
• Credit, charge, debit, and smart cards
An Overview of Transaction Processing Systems
TPS, MIS/DSS, and Special-Purpose Information Systems
Traditional Transaction Processing Methods

• **Batch processing** – method of computerized processing in which business transactions are accumulated over a period of time and prepared for processing as a single unit.

• **On-line transaction processing (OLTP)** - method of computerized processing in which each transaction is processed immediately and the affected records are updated.
Batch versus On-Line Processing

(a) Batch Processing
- Data entry of accumulated transactions
- Input (batched)
- Output

(b) On-Line Transaction Processing
- Terminal
- Immediate processing of each transaction
- Central computer (processing)
- Output
Integration of a Firm’s TPSs

[Diagram showing the integration of a firm's transaction processing systems (TPSs)]
Transaction Processing Activities

- Data collection: Capturing data necessary for the transaction
- Data editing: Check validity and completeness
  - Ex: 400 hours/week instead of 40 hours/week
- Data correction: Correct the wrong data
- Data manipulation: Calculate, summarize
- Data storage: Update transactions
- Document production and reports: Create end results (paychecks)
Data Processing Activities Common in Transaction Processing Systems

- Original data
  - Data collection
  - Data editing
    - “Bad” data
      - Data correction
      - TPS reports
    - “Good” data
      - Data manipulation
      - Data storage
      - Document production
Point-of-Sale Transaction System
# Systems that Support Order Processing

<table>
<thead>
<tr>
<th>Order Processing System</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order entry</td>
<td>Data for order</td>
</tr>
<tr>
<td>Sales configuration</td>
<td>Ensure enough products</td>
</tr>
<tr>
<td>Shipment planning</td>
<td>Which order from which location</td>
</tr>
<tr>
<td>Shipment execution</td>
<td>Right products on time</td>
</tr>
<tr>
<td>Inventory control</td>
<td>Reflect exact quantity</td>
</tr>
<tr>
<td>Invoicing and billing</td>
<td>Generate customer invoice</td>
</tr>
<tr>
<td>Customer management</td>
<td>Monitor customer contact</td>
</tr>
<tr>
<td>Routing and scheduling</td>
<td>Best way to move products</td>
</tr>
</tbody>
</table>
Order Processing Systems

- Customer
  - Customer order in person or via mail, phone, EDI, or Internet
    - Order entry/sales configuration
      - Inventory status
        - Inventory control
          - Stock no.
            - Quantity picked
              - Shipment execution
                - Picking list
                  - Shipped orders
                    - Invoicing
                      - Planned shipments
                        - Routing
                          - Planned shipments and routes
                            - Scheduling
                              - Shipments
                                - Shipment planning
                                  - Orders
                                    - Invoicing
                                      - Invoice
                                        - Products
Business Resumption Planning

The process of anticipating and minimizing the effects of disasters.

• **Focuses primarily on two issues:**
  – maintaining the integrity of corporate information
  – keeping key information systems running until normal operations can be resumed

• **Disaster recovery** – implementation of the business resumption plan
Enterprise Resource Planning
Some ERP Software Vendors

<table>
<thead>
<tr>
<th>Software Vendor</th>
<th>Name of Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle</td>
<td>Oracle Manufacturing</td>
</tr>
<tr>
<td>SAP America</td>
<td>SAP R/3</td>
</tr>
<tr>
<td>Baan</td>
<td>Triton</td>
</tr>
<tr>
<td>PeopleSoft</td>
<td>PeopleSoft</td>
</tr>
<tr>
<td>J. D. Edwards</td>
<td>WorldSoftware and One World</td>
</tr>
<tr>
<td>Ross Systems</td>
<td>iRenaissance</td>
</tr>
<tr>
<td>QAD</td>
<td>MFG/Pro</td>
</tr>
</tbody>
</table>
Commonalities Among ERP Systems

- Integrate data: Enter data once; access everywhere
- Operate in Client/Server Environment
- Based on Objects:
  - Uses object-oriented approach
  - Easy to extend
- Employ Tables:
  - System configuration table: Defines how the system is set up
  - Control table: Defines functions that help the user
    - Does not allow a non-existing product to be purchased
  - Application data table: Content-related data
Advantages of ERP

• Elimination of costly, inflexible legacy systems
  – Single integrated system

• Improvement of work processes
  – Support best practices: Most efficient and effective way of carrying out a business process

• Increase in access to data for operational decision making
  – A sale is reflected in inventory control

• Upgrade of technology infrastructure
  – Uniform platform
Disadvantages of ERP

• Expense and time in implementation
• Difficulty integrating with other systems
• Risks in using one vendor
Summary

• **E-commerce** – includes business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C).

• **Transaction Processing Systems (TPSs)** - consist of all the components of a CBIS, including databases, telecommunications, people, procedures, software, and hardware devices to process transactions.

• **Business resumption plan** – anticipates and minimizes the effects of disasters.

• **Disaster recovery** – implements disaster resumption plan.