Unit 4: Building E-commerce System (5 Hrs.)

E-commerce Website/Software

- When companies need to incorporate electronic commerce components, they may opt to run servers in-house; this approach is called **self-hosting** (used most often by large companies).
- Other companies, especially midsize and smaller companies, often decide that a third-party Web-hosting service provider is a better choice than self-hosting.
- Many small Web stores use a third-party host provider for both Web services and electronic commerce functions, particularly when the Web site is small or the company sells a limited number of products.
- Internet service providers (ISPs), are in the business of providing Internet access to companies and individuals.
- Many of these companies offer Web-hosting services as well.
- To distinguish themselves from companies that provide only Internet access services, these hosting service firms sometimes call themselves something other than ISPs.
- Because the hosting services they offer are designed to help companies conduct electronic commerce, these hosting service firms sometimes call themselves commerce service providers (CSPs).
- These firms often offer Web server management and rent application software (such as databases, shopping carts, and content management programs) to businesses; thus, these companies also sometimes call themselves managed service providers (MSPs) or application service providers (ASPs).
- Despite the increasing variety of acronyms, many companies that provide some or all of these additional services still call themselves ISPs.

- Service providers offer clients hosting arrangements that include **shared hosting**, **dedicated hosting**, and **co-location**.
- **Shared hosting** means that the client's Web site is on a server that hosts other Web sites simultaneously and is operated by the service provider at its location.
- With **dedicated hosting**, the service provider makes a Web server available to the client, but the client does not share the server with other clients of the service provider.
- In both shared hosting and dedicated hosting, the service provider owns the server hardware and leases it to the client.
- The service provider is responsible for maintaining the Web server hardware and software, and provides the connection to the Internet through its routers and other network hardware.
- In a **co-location** (also spelled **collocation** and **colocation**) service, the service provider rents a physical space to the client to install its own server hardware.
- The client installs its own software and maintains the server.
- The service provider is responsible only for providing a reliable power supply and a connection to the Internet through its routers and other networking hardware.

BASIC FUNCTIONS OF ELECTRONIC COMMERCE SOFTWARE

- The type of electronic commerce software an organization needs depends on several factors, with size and budget being the primary drivers.
- One of the most important factors is the expected **size** of the enterprise and its projected traffic and sales.
- A high-traffic electronic commerce site with thousands of catalog inquiries each minute requires different software than a small online shop selling a dozen items.
- Another determining factor is **budget**.
- Creating an online store can be much less expensive than building a chain of retail stores. The start-up cost of an electronic commerce operation can be much lower than the cost of creating a brick-and-mortar sales and distribution channel that includes warehouses and multiple retail outlets.
- A traditional store requires a physical location with leases, employees, utility payments, and maintenance.
- The cost of creating the infrastructure for an online business can be much lower.

- The specific duties that electronic commerce software performs range from a few fundamental operations to a complete solution—from catalog display to fulfillment notification.
- All electronic commerce software must provide:

1. A catalog display
2. Shopping cart capabilities
3. Transaction processing

- Larger and more complex electronic commerce sites also use software that adds other features and capabilities to the basic set of commerce tools.
- These additional software components can include:

1. Middleware that integrates the electronic commerce system with existing company information systems that handle inventory control, order processing, and accounting
2. Enterprise application integration
3. Web services
4. Integration with enterprise resource planning (ERP) software
5. Supply chain management (SCM) software
6. Customer relationship management (CRM) software
7. Content management software
8. Knowledge management software

Catalog Display

- A catalog organizes the goods and services being sold.
- To further organize its offerings, a retailer may break them down into departments.
- As in a physical store, merchandise in an online store can be grouped within logical departments to make locating an item, such as a camping stove, simpler.
- Web stores often use the same department names as their physical counterparts.
- In most physical stores, each product is kept in only one place.
- A Web store has the advantage of being able to include a single product in multiple categories.
- For example, running shoes can be listed as both footwear and athletic gear.

Static Catalog

- A small commerce site can have a very simple static catalog.
- A catalog is a listing of goods and services.
- A static catalog is a simple list written in HTML that appears on a Web page or a series of Web pages.
- To add an item, delete an item, or change an item's listing, the company must edit the HTML of one or more pages.
- Small online stores that sell fewer than 100 items usually need only a simple list of products or categories.
- Organization of the items is not particularly important.
- Companies that offer only a small number of items can provide a photo of each item on the Web page that is a link to more information about the product.
- A static catalog is sufficient for their needs.

Dynamic Catalog

- Larger commerce sites are more likely to use a dynamic catalog.
- A dynamic catalog stores the information about items in a database, usually on a separate computer that is accessible to the server that is running the Web site itself.
- A dynamic catalog can feature multiple photos of each item, detailed descriptions, and a search tool that allows customers to search for an item and determine its availability.
- The software that implements a dynamic catalog is often included in larger electronic commerce software packages; however, some companies write their own software to link their existing databases of product information to their Web sites.
- Larger electronic commerce sites require the more sophisticated navigation aids and better product organization tools that are a part of dynamic catalogs..

Shopping Cart

- In the early days of electronic commerce, shoppers selected items they wanted to purchase by filling out online forms.
- Using text box and list box form controls to indicate their choices, users entered the quantity of an item in the quantity text box, the SKU (stockkeeping unit) or product number in another text box, and the unit price in yet another text box.
- This system was awkward for ordering more than one or two items at a time.
- One problem with forms-based shopping was that shoppers had to write down product codes, unit prices, and other information about the product before going to the order form, which was inevitably on another page.
- Another problem was that customers sometimes forgot whether they had clicked the submit button to send in their orders.
- As a result, they either sent the same order twice (pressing the submit button when they had already done so) or thought they had submitted the order when they really had not (consequently failing to submit the order).
- The forms-based method of shopping was confusing and error prone.

Gary's Music Store Order Form

To Order: Please complete order form and click the **Submit Order** button at the bottom of this page..

Purchase Date 07/26/2010

Item Number	Description	Quantity
429681	Easy Piano Series #5	3
786412	Intermediate Drum Drills	5
691127	Clarinet Reeds #2 Dz Box	2

Shipping Address:

Name: James T. Toadvine
Shipping Address: 9227 Mt. Helix Road
City: West Lafayette State: IN
Purchase Order Number (if any): 226685 Zip: 47906
Phone Number: 574-555-2110
E-mail Address: toadvine999@yahoo.com

Billing Address: ☑ Check if same as shipping address

Name:
Mailing Address:
City: State:
Phone: Zip:
E-mail:

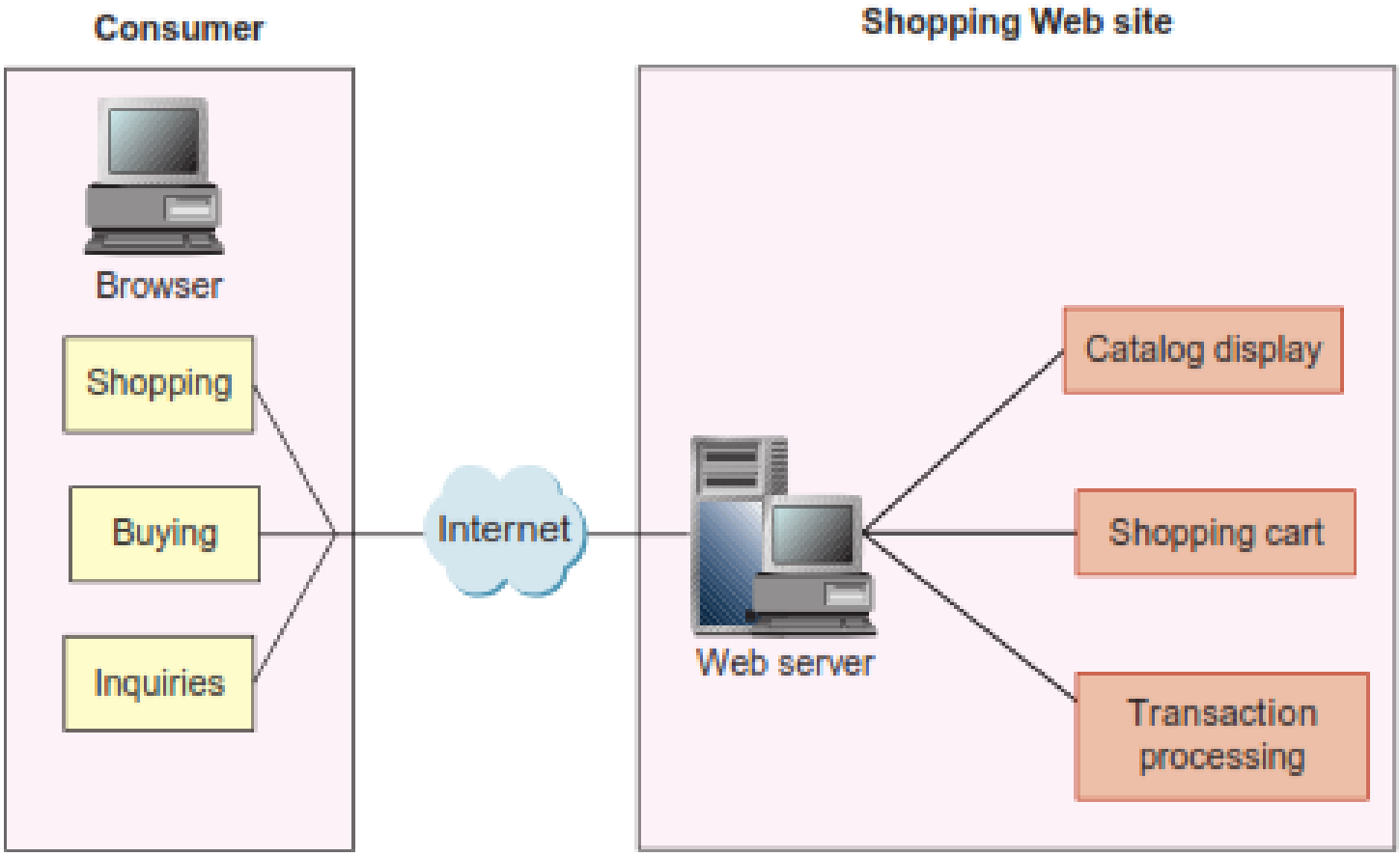
Submit Order Clear Form

- Shopping carts are now the standard method for processing sales on most electronic commerce sites.
- A shopping cart, also sometimes called a shopping bag or shopping basket, keeps track of the items the customer has selected and allows customers to view the contents of their carts, add new items, or remove items.
- To order an item, the customer simply clicks that item.
- All of the details about the item, including its price, product number, and other identifying information, are stored automatically in the cart.
- If a customer later changes his or her mind about an item, he or she can view the cart's contents and remove the unwanted items.
- When the customer is ready to conclude the shopping session, the click of a button executes the purchase transaction.

Typical shopping cart page

Transaction Processing

- Transaction processing occurs when the shopper proceeds to the virtual checkout counter by clicking a checkout button.
- Then the electronic commerce software performs any necessary calculations, such as volume discounts, sales tax, and shipping costs.
- At checkout, the customer's Web browser software and the seller's Web server software both switch into a secure state of communication.
- Figure shows how the three key functions of a basic electronic commerce Web site (catalog display, shopping cart, and transaction processing) are combined in the site's architecture.


Consumer
Shopping Web site
Browser
Shopping
Buying
Inquiries
Internet
Web server
Catalog display
Shopping cart
Transaction processing

Databases

- A database is a collection of information that is stored on a computer in a highly structured way.
- The rules a business establishes about its database structure are carefully thought out and take into account how the company does business (its business rules) and how the company can reduce the likelihood that errors and inconsistencies will develop in the database.
- A database manager (or database management software) is software that makes it easy for users to enter, edit, update, and retrieve information in the database.
- One common lowend database manager is Microsoft Access.
- More complex database managers that can handle larger databases and can perform more functions at higher speeds include IBM DB2, Microsoft SQL Server, and Oracle.
- Companies with very large databases that have operations in many locations must make most (or all) of their data available to users in those locations.
- Large information systems that store the same data in many different physical locations are called distributed information systems, and the databases within those systems are called distributed database systems. The complexity of these systems leads to their high cost.

- Most companies that can afford it do use commercial database products; however, an increasing number of companies and other organizations are using MySQL, which was developed and is maintained by a community of programmers on the Web.
- Similar to the Linux operating system you learned about in earlier chapters, MySQL is open-source software, even though it was developed by a Swedish company (MySQL AB), which has been owned since 2008 by Sun.
- Except for small sites offering only a few products, companies should determine the level of database support provided by any electronic commerce software they are considering.
- Most online stores that sell many products use a database that stores product information, including size, color, type, and price details.
- Usually, the database that serves an online store is the same one that is used by the company's existing sales operations.
- It is usually better to have one database serving the two sales functions (online and in-store retail, for example) because it eliminates the errors that can occur when running parallel but distinct databases.

Middleware

- Larger companies usually establish the connections between their electronic commerce software (that is, their catalog display, shopping cart, and transaction processing software) and their accounting and inventory management databases or applications by using middleware.
- Middleware is software that takes information about sales and inventory shipments from the electronic commerce software and transmits it to accounting and inventory management software in a form that these systems can read.
- For example, the sales module of an accounting system might be designed to accept the input of a telephone salesperson.
- The salesperson enters the product numbers, quantities, and shipping method into the sales module by using a keyboard while talking to the customer on the phone.
- Middleware would extract information about a sale from the Web site's shopping cart software and enter it directly into the accounting software's sales module without requiring that a person re-enter the information.

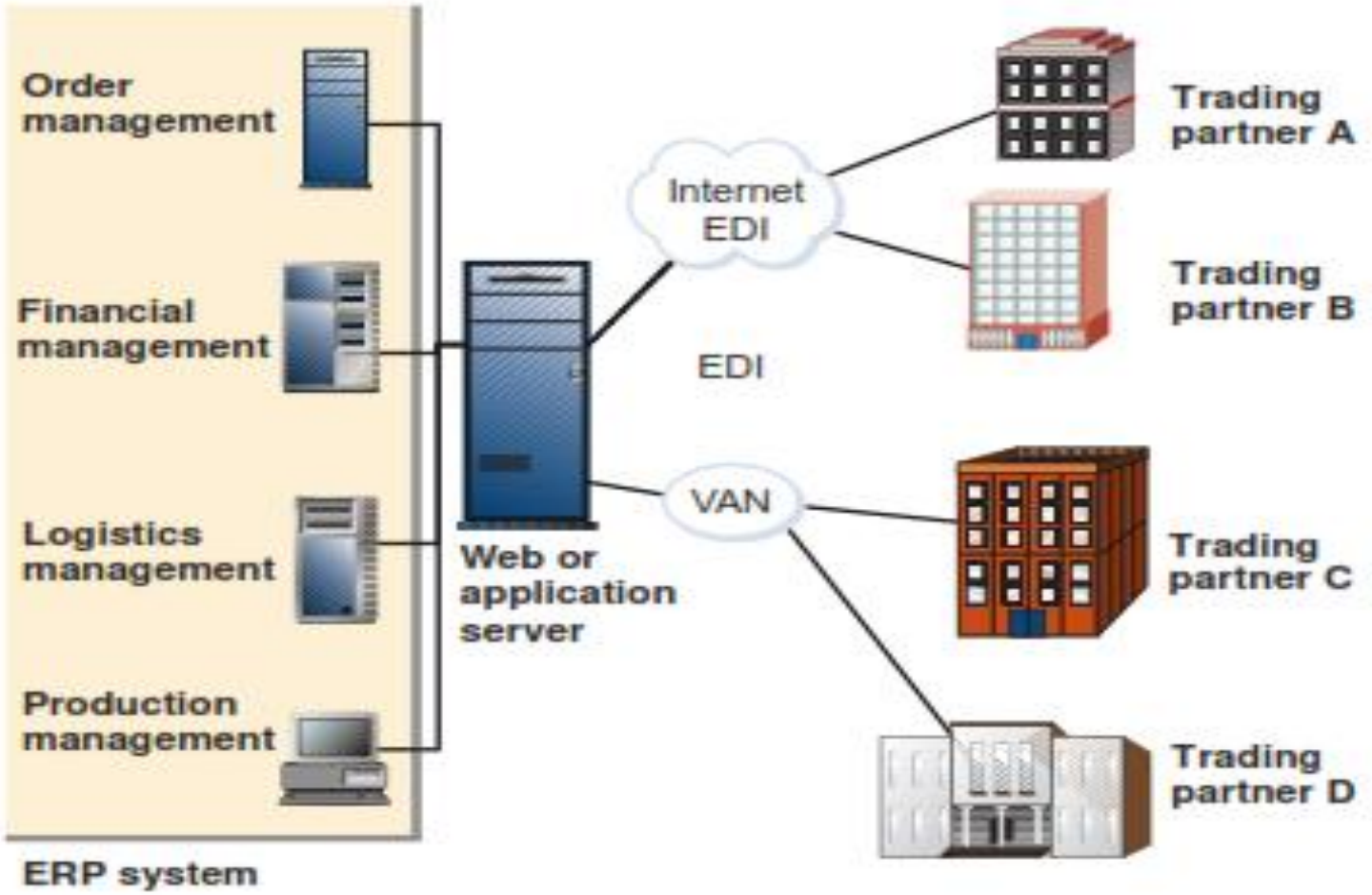
Enterprise Application Integration

- A program that performs a specific function, such as creating invoices, calculating payroll, or processing payments received from customers, is called an **application program**, application software or, more simply, an application.
- An application server is a computer that takes the request messages received by the Web server and runs application programs that perform some kind of action based on the contents of the request messages.
- The actions that the application server software performs are determined by the rules used in the business.
- These rules are called business logic.
- An example of a business rule is: When a customer logs in, check the password entered against the password file in the database.

Integration with ERP Systems

- Many B2B Web sites must be able to connect to existing information systems such as enterprise resource planning software.
- Enterprise resource planning (ERP) software packages are business systems that integrate all facets of a business, including accounting, logistics, manufacturing, marketing, planning, project management, and treasury functions.
- The two major ERP vendors are Oracle and SAP.
- A typical installation of ERP software costs between $2 million and $25 million; thus, companies that are already running these systems have made a significant investment in them and require that their electronic commerce and EDI operations to integrate with them.

ERP system integration with EDI (Electronic Data Interchange)



Home Assignment: 4

- Integration with Payment Gateways