



Faculty of Computer Science & Information Technology

Department of Information Technology

4th year – 7th Semester

E-commerce

**Chapter 3(B): Building an E-commerce Presence:
Websites, Mobile Sites, and Apps**



Simple vs. Multi-tiered Web Site Architecture

■ System architecture

- ❖ Arrangement of software, machinery, and tasks in an information system needed to achieve a specific functionality

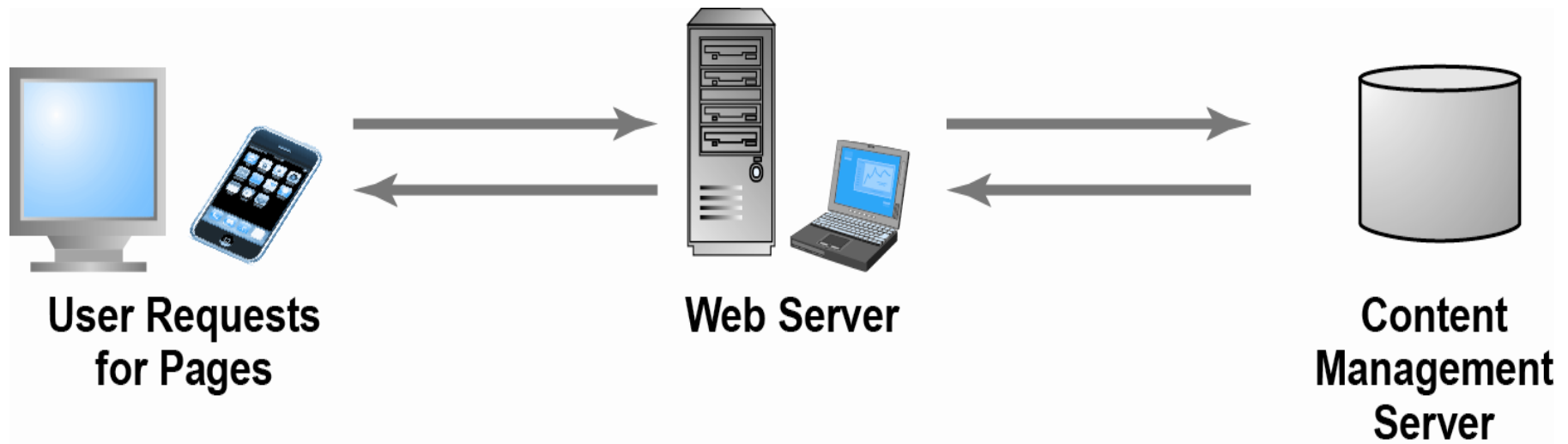
■ Two-tier

- ❖ Web server and database server

■ Multi-tier

- ❖ Web application servers
- ❖ Backend, legacy databases

Two-Tier E-commerce Architecture



(a) Two-tier Architecture

Multi-Tier E-commerce Architecture

Web Server Layer

Incoming Internet requests
T1 Line
1.544 Mbps



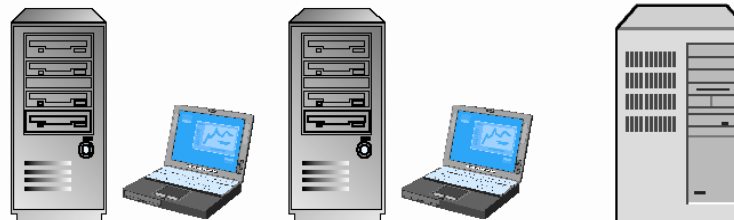
Web Servers

Middle-tier Layer



E-commerce Servers
Application Servers
Database Servers
Ad Servers
Mail Servers

Backend Layer



Corporate applications
Finance
Production MRP
Enterprise systems
HR systems

(b) Multi-tier Architecture

In a multi-tier architecture, a Web server is linked to a middle-tier layer that typically includes a series of application servers that perform specific tasks, as well as to a backend layer of existing corporate systems.

Figure 3.11(b), Page 195



Web Server Software

■ Apache

- ❖ Leading Web server software (51% of market)
- ❖ Works with UNIX, Linux operating systems

■ Microsoft's Internet Information Server (IIS)

- ❖ Second major Web server software (12% of market)
- ❖ Windows-based

TABLE 3.4**BASIC FUNCTIONALITY PROVIDED BY WEB SERVERS**

FUNCTIONALITY	DESCRIPTION
Processing of HTTP requests	Receive and respond to client requests for HTML pages
Security services (Secure Sockets Layer)/ Transport Layer Security	Verify username and password; process certificates and private/public key information required for credit card processing and other secure information
File Transfer Protocol	Permits transfer of very large files from server to server
Search engine	Indexing of site content; keyword search capability
Data capture	Log file of all visits, time, duration, and referral source
E-mail	Ability to send, receive, and store e-mail messages
Site management tools	Calculate and display key site statistics, such as unique visitors, page requests, and origin of requests; check links on pages

Table 3.4, Page 196



Site Management Tools

■ Basic tools

- ❖ Included in all Web servers
 - Verify that links on pages are still valid
 - Identify orphan files

■ Third-party software for advanced management

- ❖ Monitor customer purchases, marketing campaign effectiveness, and so on
- ❖ Webtrends Analytics 10, Google Analytics



Application Servers

■ Web application servers:

- ❖ Provide specific business functionality required for a Web site
- ❖ Type of middleware
 - Isolate business applications from Web servers and databases



E-commerce Merchant Server Software

■ Provides basic functionality for sales

❖ Online catalog

- List of products available on Web site

❖ Shopping cart

- Allows shoppers to set aside, review, edit selections, and then make purchase

❖ Credit card processing

- Typically works in conjunction with shopping cart
- Verifies card and puts through credit to company's account at checkout

TABLE 3.10

E-COMMERCE WEB SITE FEATURES THAT ANNOY CUSTOMERS

- Requiring user to view ad or Flash introduction before going to Web site content
- Pop-up and pop-under ads and windows
- Too many clicks to get to the content
- Links that don't work
- Confusing navigation; no search function
- Requirement to register and log in before viewing content or ordering
- Slow loading pages
- Content that is out of date
- Inability to use browser's Back button
- No contact information available (Web form only)
- Unnecessary splash/flash screens, animation, etc.
- Music or other audio that plays automatically
- Unprofessional design elements
- Text not easily legible due to size, color, format
- Typographical errors
- No or unclear returns policy

TABLE 3.11**THE EIGHT MOST IMPORTANT FACTORS IN SUCCESSFUL E-COMMERCE SITE DESIGN**

FACTOR	DESCRIPTION
Functionality	Pages that work, load quickly, and point the customer toward your product offerings
Informational	Links that customers can easily find to discover more about you and your products
Ease of use	Simple foolproof navigation
Redundant navigation	Alternative navigation to the same content
Ease of purchase	One or two clicks to purchase
Multi-browser functionality	Site works with the most popular browsers
Simple graphics	Avoids distracting, obnoxious graphics and sounds that the user cannot control
Legible text	Avoids backgrounds that distort text or make it illegible

Table 3.11, Page 210



Tools for Interactivity and Active Content

- **CGI (Common Gateway Interface)**
- **ASP (Active Server Pages)/ASP.NET**
- **Java, JSP, and JavaScript**
- **ActiveX and VBScript**
- **ColdFusion**
- **PHP, Ruby on Rails, Django**
- **Web 2.0 design elements:**
 - ❖ **Widgets, mashups**



Personalization Tools

■ Personalization

- ❖ Ability to treat people based on personal qualities and prior history with site

■ Customization

- ❖ Ability to change the product to better fit the needs of the customer

■ Cookies

- ❖ Primary method to achieve personalization



The Information Policy Set

■ Privacy policy

- ❖ Set of public statements declaring how site will treat customers' personal information that is gathered by site

■ Accessibility rules

- ❖ Set of design objectives that ensure disabled users can effectively access site



Developing a Mobile Web Site and Building Mobile Applications

■ Three types of m-commerce software

- ❖ Mobile Web site
 - Responsive Web design
- ❖ Mobile Web app
- ❖ Native app



Planning and Building a Mobile Presence

- **Identify business objectives, system functionality, and information requirements**
- **Choice:**
 - ❖ Mobile Web site or mobile Web app
 - Less expensive
 - ❖ Native app
 - Can use device hardware, available offline

TABLE 3.13**UNIQUE FEATURES THAT MUST BE TAKEN INTO ACCOUNT WHEN DESIGNING A MOBILE PRESENCE**

FEATURE

IMPLICATIONS FOR MOBILE PLATFORM

Hardware

Mobile hardware is smaller, and there are more resource constraints in data storage and processing power.

Connectivity

The mobile platform is constrained by slower connection speeds than desktop Web sites.

Displays

Mobile displays are much smaller and require simplification. Some screens are not good in sunlight.

Interface

Touch-screen technology introduces new interaction routines different from the traditional mouse and keyboard. The mobile platform is not a good data entry tool but can be a good navigational tool.



Mobile Presence Design Considerations

■ Platform constraints

- ❖ Graphics, file sizes

■ Mobile first design

- ❖ Desktop Web site design after mobile design

■ Responsive Web design (RWD)

- ❖ CSS site adjusts layout of site according to device screen resolutions

■ Adaptive Web design (AWD)

- ❖ Server delivers different templates or versions of site optimized for device



Cross-Platform Mobile App Development Tools

■ Objective C, Java

■ Low cost, open-source alternatives

- ❖ Appery.io
- ❖ Codiqua
- ❖ PhoneGap
- ❖ MoSynch
- ❖ Appcelerator



Performance and Cost Considerations

- **Mobile first design: Most efficient**
- **Mobile Web site:**
 - ❖ Resizing existing Web site for mobile access is least expensive
- **Mobile Web app:**
 - ❖ Can utilize browser API
- **Native app:**
 - ❖ Most expensive; requires more programming