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Chapter 4

Building an E-commerce Presence: Web Sites, Mobile Sites, and Apps

Tommy Hilfiger Replatforms

- **What reasons were behind Hilfiger's choice of ATG for its Web site solution?**

- **Why did Hilfiger decide it needed to replatform in 2011?**

- **What are some of the site-building options for operators of smaller Web sites?**

Imagine Your E-commerce Presence

■ **What's the idea?**

❖ Vision

❖ Mission statement

❖ Target audience

❖ Intended market space

❖ Strategic analysis

❖ Internet marketing matrix

❖ Development timeline and preliminary budget

Imagine Your E-commerce Presence (cont.)

- **Where's the money?**
  - ❖ Business model(s):
    - Portal, e-tailer, content provider, transaction broker, market creator, service provider, community provider
  - ❖ Revenue model(s):
    - Advertising, subscriptions, transaction fees, sales, and affiliate revenue.

Imagine Your E-commerce Presence (cont.)

■ **Who and where is the target audience?**

  ❖ Describing your audience

    ■ Demographics

      ❖ Age, gender, income, location

    ■ Behavior patterns (lifestyle)

    ■ Consumption patterns (purchasing habits)

    ■ Digital usage patterns

    ■ Content creation patterns (blogs, Facebook)

    ■ Buyer personas

Imagine Your E-commerce Presence (cont.)

- **Characterize the marketplace**
  - ❖ Demographics
  - ❖ Size, growth, changes
  - ❖ Structure
    - ▪ Competitors
    - ▪ Suppliers
    - ▪ Substitute products
- **Where is the content coming from?**
  - ❖ Static or dynamic?

Imagine Your E-commerce Presence (cont.)

- **Know yourself—SWOT analysis**
- **Develop an e-commerce presence map**
- **Develop a timeline: Milestones**
- **How much will this cost?**
  - ❖ Simple Web sites: up to $5000
  - ❖ Small Web start-up: $25,000 to $50,000
  - ❖ Large corporate site: $100,000+ to millions

SWOT Analysis

STRENGTHS
- Current sites do not address market needs
- Unique approach
- Easy navigation
- Better personalization
- Customer base growing
- High-value market segment
- Superior social strategy

WEAKNESSES
- Limited financial resources
- No prior online experience
- No existing user base
- No media attention
- No Web design expertise
- No computer background

OPPORTUNITIES
- Ability to address large market with unmet needs
- Potential to capture significant share of this market
- Potential to develop related sites

THREATS
- Approach could be copied by competitors
- Advertisers may not want to try a new site
- Rapid pace of technological development
- Low market entry costs

Figure 4.1, page 199

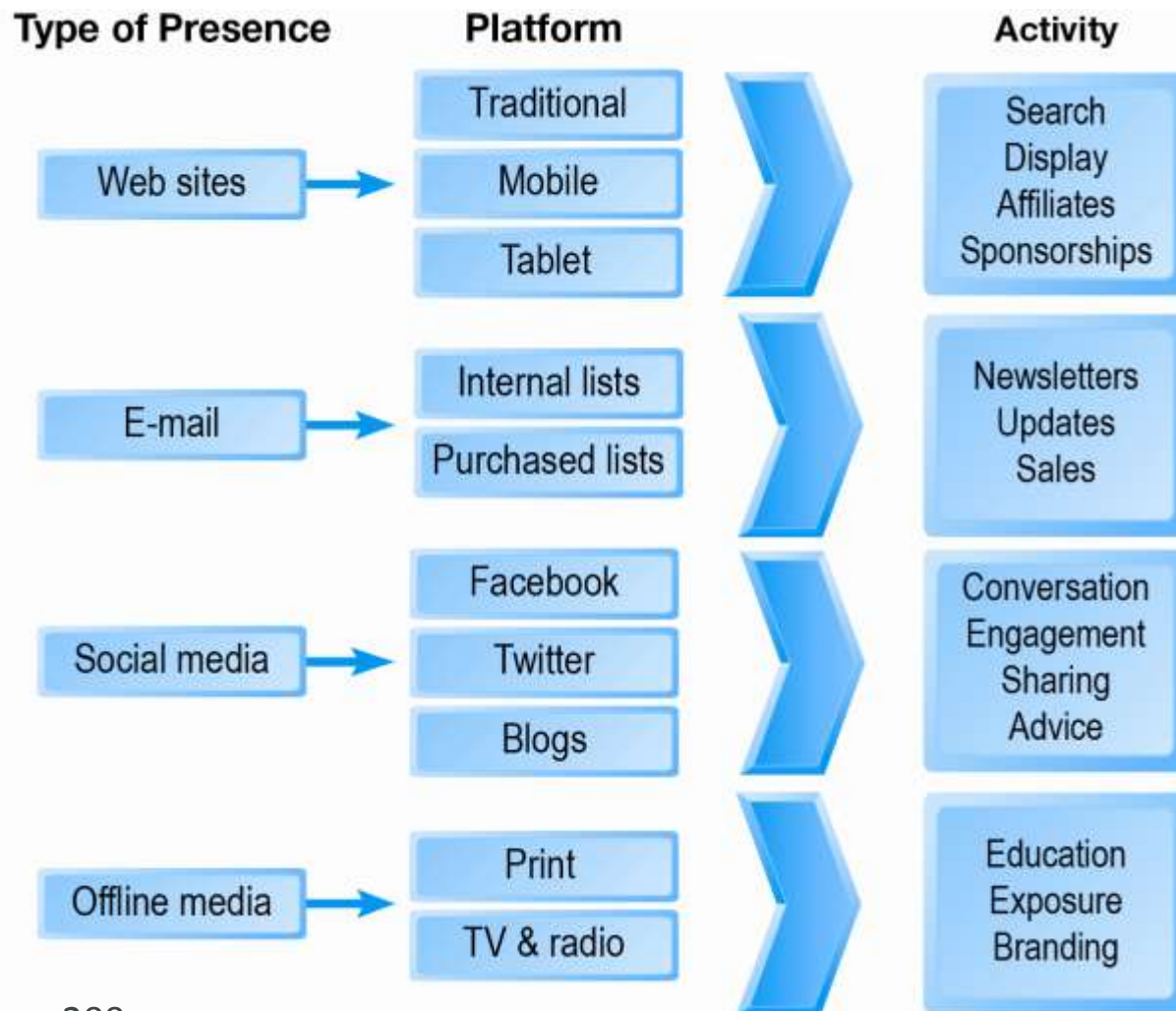# E-commerce Presence Map

Figure 4.2, page 200

Building an E-commerce Site: A Systematic Approach

- **Most important management challenges:**
  - ❖ Developing a clear understanding of business objectives
  - ❖ Knowing how to choose the right technology to achieve those objectives

Pieces of the Site-building Puzzle

- **Main areas where you will need to make decisions:**
  - ❖ Human resources and organizational capabilities
    - Creating team with skill set needed to build and manage a successful site
  - ❖ Hardware/software
  - ❖ Telecommunications
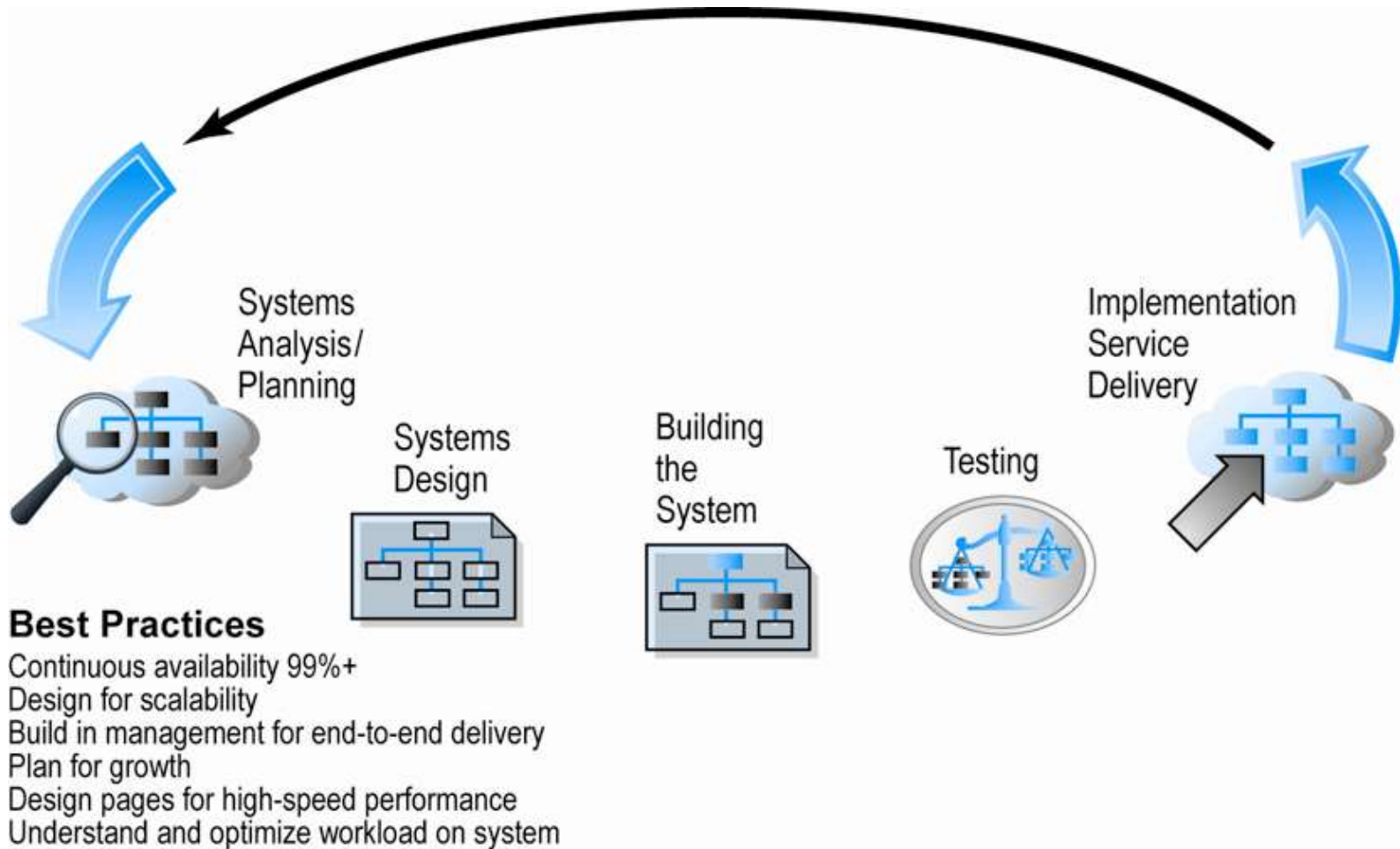 - ❖ Site design

The Systems Development Life Cycle

- **Methodology for understanding business objectives of a system and designing an appropriate solution**

- **Five major steps:**
  - Systems analysis/planning
  - Systems design
  - Building the system
  - Testing
  - Implementation

Web Site Systems Development Life Cycle

Best Practices
Continuous availability 99%+
Design for scalability
Build in management for end-to-end delivery
Plan for growth
Design pages for high-speed performance
Understand and optimize workload on system

Figure 4.5, Page 204

System Analysis/Planning

- **Business objectives:**

  - List of capabilities you want your site to have

- **System functionalities:**

  - List of information system capabilities needed to achieve business objectives

- **Information requirements:**

  - Information elements that system must produce in order to achieve business objectives

TABLE 4.2	SYSTEM ANALYSIS: BUSINESS OBJECTIVES, SYSTEM FUNCTIONALITY, AND INFORMATION REQUIREMENTS FOR A TYPICAL E-COMMERCE SITE	
BUSINESS OBJECTIVE	SYSTEM FUNCTIONALITY	INFORMATION REQUIREMENTS
Display goods	Digital catalog	Dynamic text and graphics catalog
Provide product information (content)	Product database	Product description, stocking numbers, inventory levels
Personalize/customize product	Customer on-site tracking	Site log for every customer visit; data mining capability to identify common customer paths and appropriate responses
Engage customers in conversations	On site blog	Software with blogging and community response functionality
Execute a transaction	Shopping cart/payment system	Secure credit card clearing; multiple payment options
Accumulate customer information	Customer database	Name, address, phone, and e-mail for all customers; online customer registration
Provide after-sale customer support	Sales database	Customer ID, product, date, payment, shipment date
Coordinate marketing/advertising	Ad server, e-mail server, e-mail, campaign manager, ad banner manager	Site behavior log of prospects and customers linked to e-mail and banner ad campaigns
Understand marketing effectiveness	Site tracking and reporting system	Number of unique visitors, pages visited, products purchased, identified by marketing campaign
Provide production and supplier links	Inventory management system	Product and inventory levels, supplier ID and contact, order quantity data by product

Table 4.2, page 205

Systems Design:
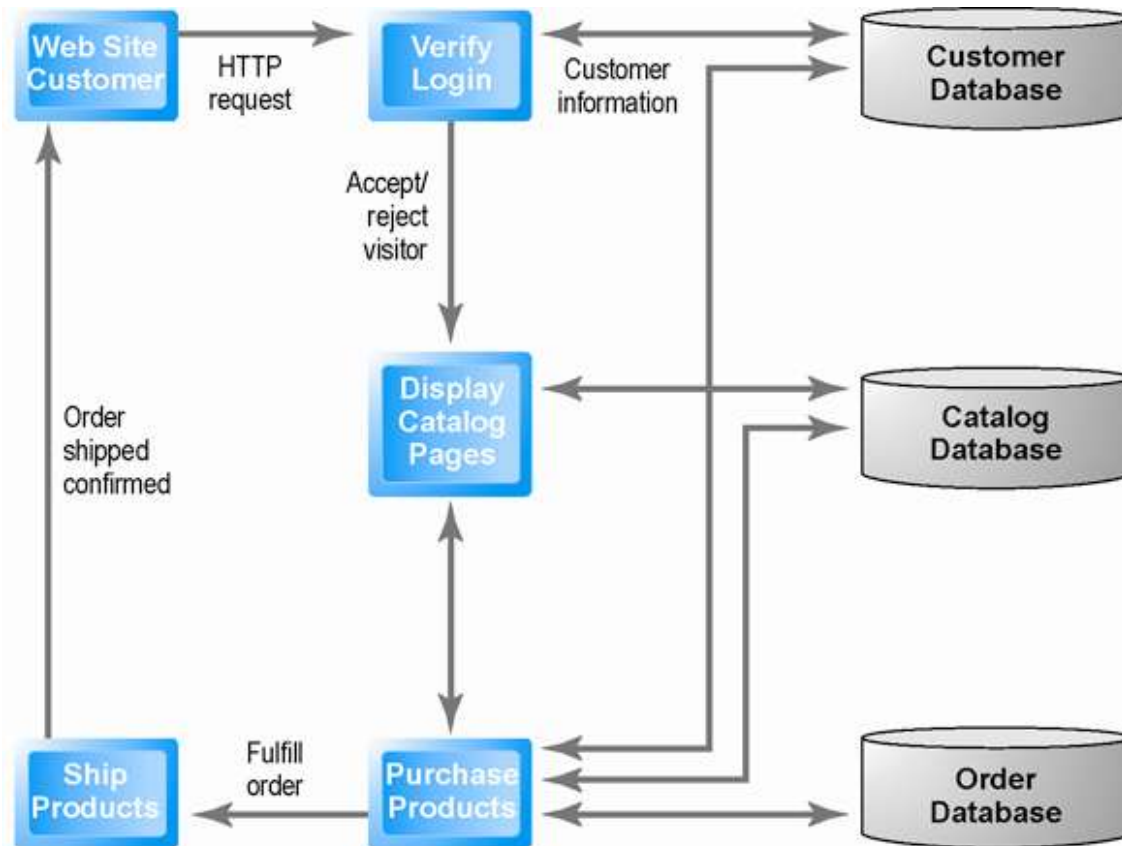# Hardware and Software Platforms

- **System design specification:**
  - ❖ Description of main components of a system and their relationship to one another

- **Two components of system design:**
  - ❖ Logical design
    - Data flow diagrams, processing functions, databases
  - ❖ Physical design
    - Specifies actual physical, software components, models, etc.

Logical Design for a Simple Web Site

(a) Simple Data Flow Diagram

This data flow diagram describes the flow of information requests and responses for a sample Web site

Figure 4.6 (a), Page 207
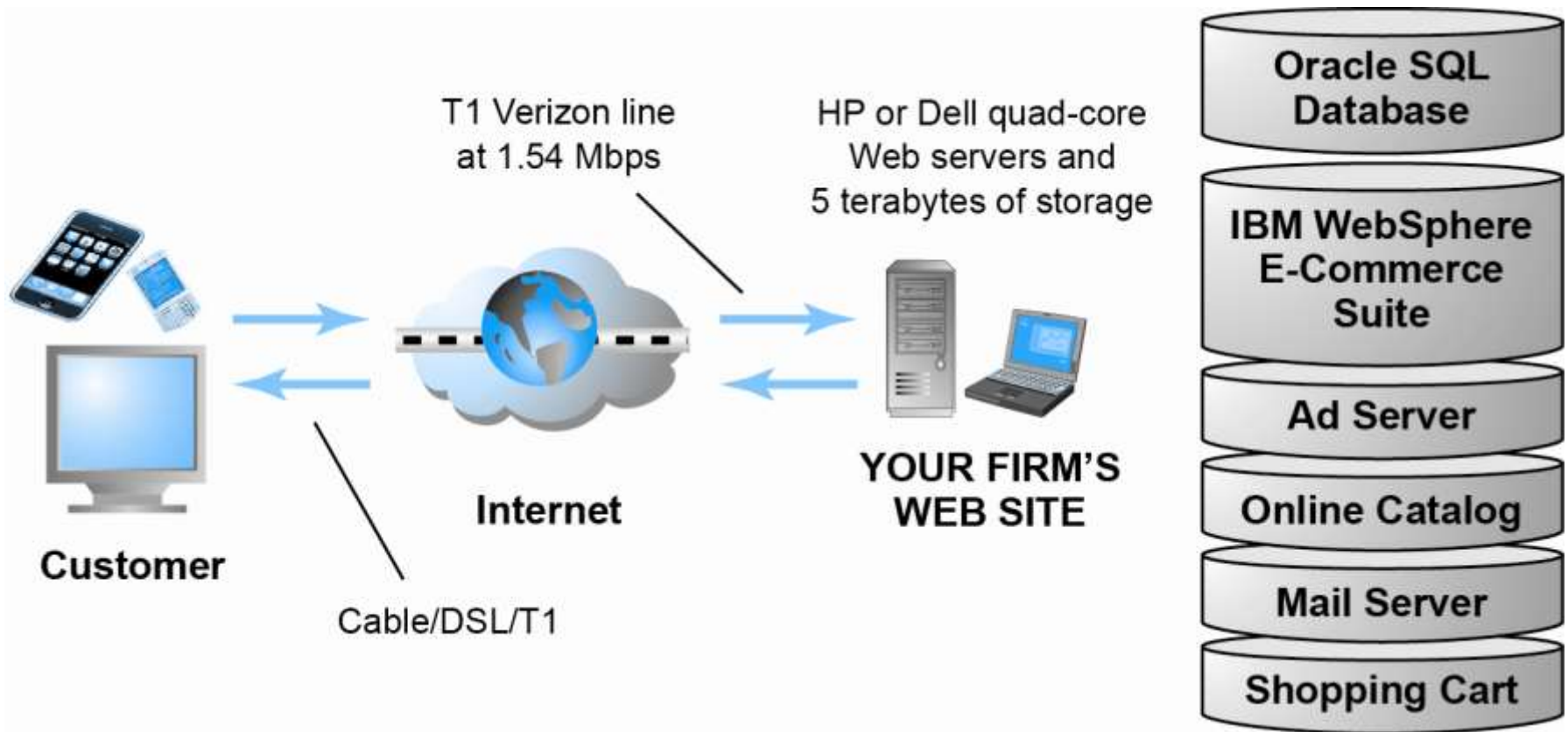
Physical Design for a Simple Web Site

Figure 4.6 (b), Page 207

Build/Host Your Own vs. Outsourcing

- **Outsourcing: Hiring vendors to provide services involved in building site**

- **Build own vs. outsourcing:**
  - ❖ Build your own requires team with diverse skill set; choice of software tools; both risks and possible benefits

- **Host own vs. outsourcing**
  - ❖ **Hosting:** Hosting company responsible for ensuring site is accessible 24/7, for monthly fee
  - ❖ **Co-location:** Firm purchases or leases Web server (with control over its operation), but server is located at vendor's facility
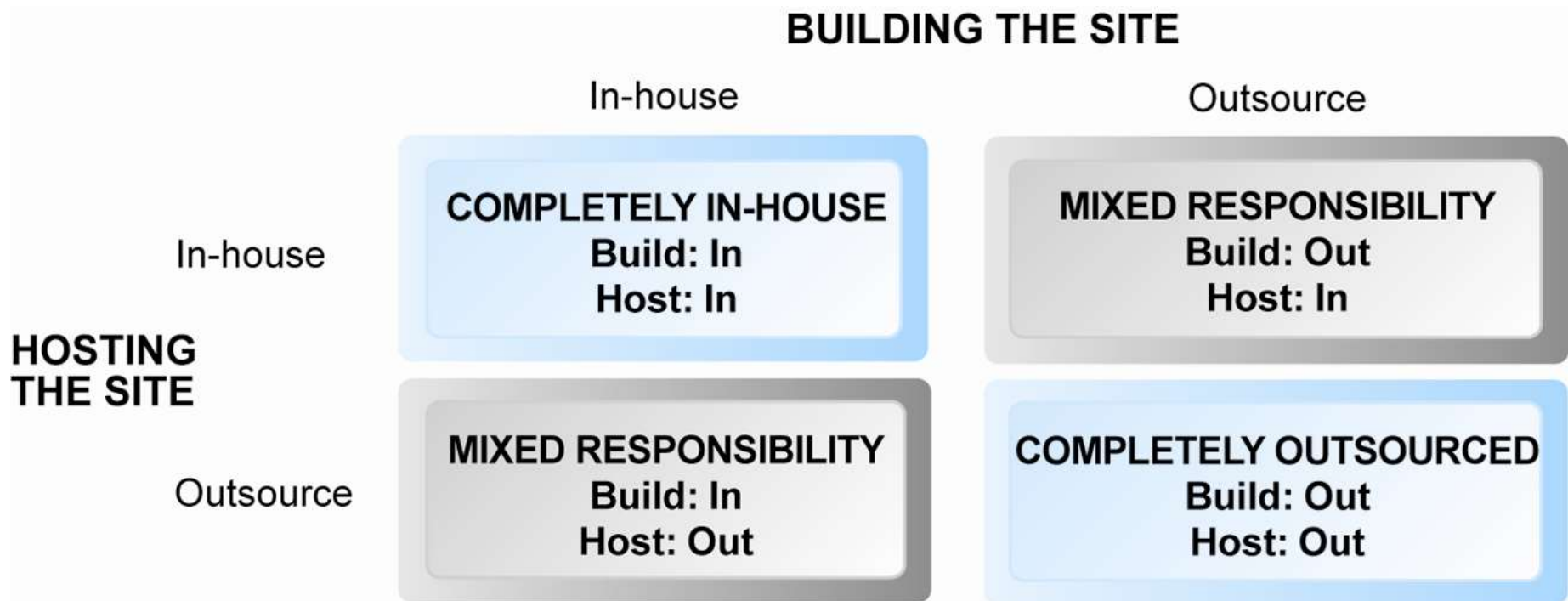
Choices in Building and Hosting

Figure 4.7 Page 208

Curly Hair and Appillionaires

- **How does a small, niche Web site like NaturallyCurly.com become profitable?**

- **How has cloud computing and social media reduced costs?**

- **How is the app economy changing the economics of software production and e-commerce?**

Testing, Implementation, and Maintenance

- **Testing**
  - ❖ Unit testing
  - ❖ System testing
  - ❖ Acceptance testing

- **Implementation and maintenance:**
  - ❖ Maintenance is ongoing
  - ❖ Maintenance costs: Similar to development costs
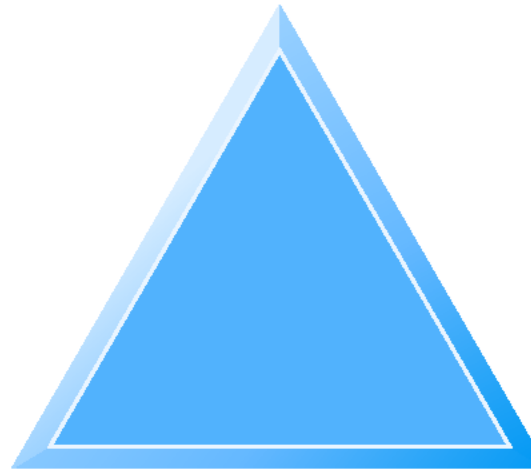 - ❖ Benchmarking

Factors in Web Site Optimization

Page Delivery

Content delivery networks
Edge caching
Bandwidth

Page Generation

Server response time
Device-based accelerators
Efficient resource allocation
Resource utilization thresholds
Monitoring site performance

Page Content

Optimize HTML
Optimize images
Site architecture
Efficient page style

Figure 4.10, Page 215

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

User Requests for Pages → **Web Server** → **Content Management Server**

(a) Two-tier Architecture
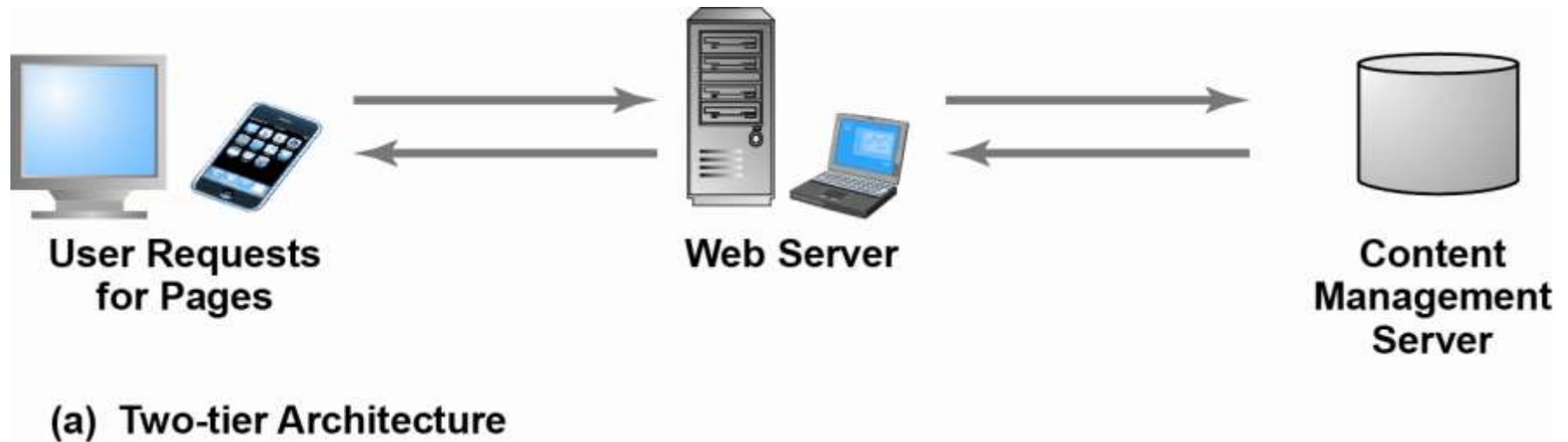
Figure 4.11(a), Page 217

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 4.11(b), Page 217

Web Server Software

- **Apache**
  - Leading Web server software (66% of market)
  - Works with UNIX, Linux OSs

- **Microsoft's Internet Information Server (IIS)**
  - Second major Web server software (16% of market)
  - Windows-based

TABLE 4.4	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)	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 4.4, Page 219

Site Management Tools

- **Basic tools**
  - ❖ Included in all Web servers, e.g.,
    - ▪ Verify that links on pages are still valid
    - ▪ Identify orphan files

- **Third-party software for advanced management**
  - ❖ Monitor customer purchases, marketing campaign effectiveness, etc.
  - ❖ WebTrends Analytics 10, Google Analytics

Dynamic Page Generation Tools

- **Dynamic page generation:**
  - ❖ Contents stored in database and fetched when needed
- **Common tools:**
  - ❖ CGI, ASP, JSP, ODBC
- **Advantages**
  - ❖ Lowers menu costs
  - ❖ Permits easy online market segmentation
  - ❖ Enables cost-free price discrimination
  - ❖ Enables content management system (CMS)

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

  - ❖ Single-function applications being replaced by integrated software tools that combine all functionality needed for e-commerce site

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

Merchant Server Software Packages

- **Integrated environment that includes most of functionality needed**

- **Key factors in selecting a package**
  - ❖ Functionality
  - ❖ Support for different business models
  - ❖ Business process modeling tools
  - ❖ Visual site management and reporting
  - ❖ Performance and scalability
  - ❖ Connectivity to existing business systems
  - ❖ Compliance with standards
  - ❖ Global and multicultural capability
  - ❖ Local sales tax and shipping rules

Building Your Own E-commerce Site

■ **Options for small firms**

❖ Hosted e-commerce sites, e.g., Yahoo's Merchant Solutions
  ■ Site building tools
  ■ E-commerce templates

❖ Open-source merchant server software
  ■ Enables you to build truly custom sites
  ■ Requires programmer with expertise, time

The Hardware Platform

- **Hardware platform:**
  - ❖ Underlying computing equipment needed for e-commerce functionality

- **Objective:**
  - ❖ Enough platform capacity to meet peak demand without wasting money

- **Important to understand the factors that affect speed, capacity, and scalability of a site**

Right-Sizing Your Hardware Platform: The Demand Side

- **Customer demand:**
  - ❖ Most important factor affecting speed of site

- **Factors in overall demand:**
  - ❖ Number of simultaneous users in peak periods
  - ❖ Nature of customer requests (user profile)
  - ❖ Type of content (dynamic vs. static Web pages)
  - ❖ Required security
  - ❖ Number of items in inventory
  - ❖ Number of page requests
  - ❖ Speed of legacy applications

Right-Sizing Your Hardware Platform: The Supply Side

- **Scalability:**
  - ❖ Ability of site to increase in size as demand warrants
- **Ways to scale hardware:**
  - ❖ **Vertically**
    - Increase processing power of individual components
  - ❖ **Horizontally**
    - Employ multiple computers to share workload
  - ❖ **Improve processing architecture**

TABLE 4.8	VERTICAL AND HORIZONTAL SCALING TECHNIQUES
TECHNIQUE	**APPLICATION**
Use a faster computer	Deploy edge servers, presentation servers, data servers, etc.
Create a cluster of computers	Use computers in parallel to balance loads.
Use appliance servers	Use special-purpose computers optimized for their task.
Segment workload	Segment incoming work to specialized computers.
Batch requests	Combine related requests for data into groups, process as group.
Manage connections	Reduce connections between processes and computers to a minimum.
Aggregate user data	Aggregate user data from legacy applications in single data pools.
Cache	Store frequently used data in cache rather than on the disk.

Table 4.8, Page 230

TABLE 4.9	IMPROVING THE PROCESSING ARCHITECTURE OF YOUR SITE	
ARCHITECTURE IMPROVEMENT	**DESCRIPTION**
Separate static content from dynamic content	Use specialized servers for each type of workload.
Cache static content	Increase RAM to the gigabyte range and store static content in RAM.
Cache database lookup tables	Use cache tables used to look up database records.
Consolidate business logic on dedicated servers	Put shopping cart, credit card processing, and other CPU-intensive activity on dedicated servers.
Optimize ASP code	Examine your code to ensure it is operating efficiently.
Optimize the database schema	Examine your database search times and take steps to reduce access times.

Table 4.9, Page 230
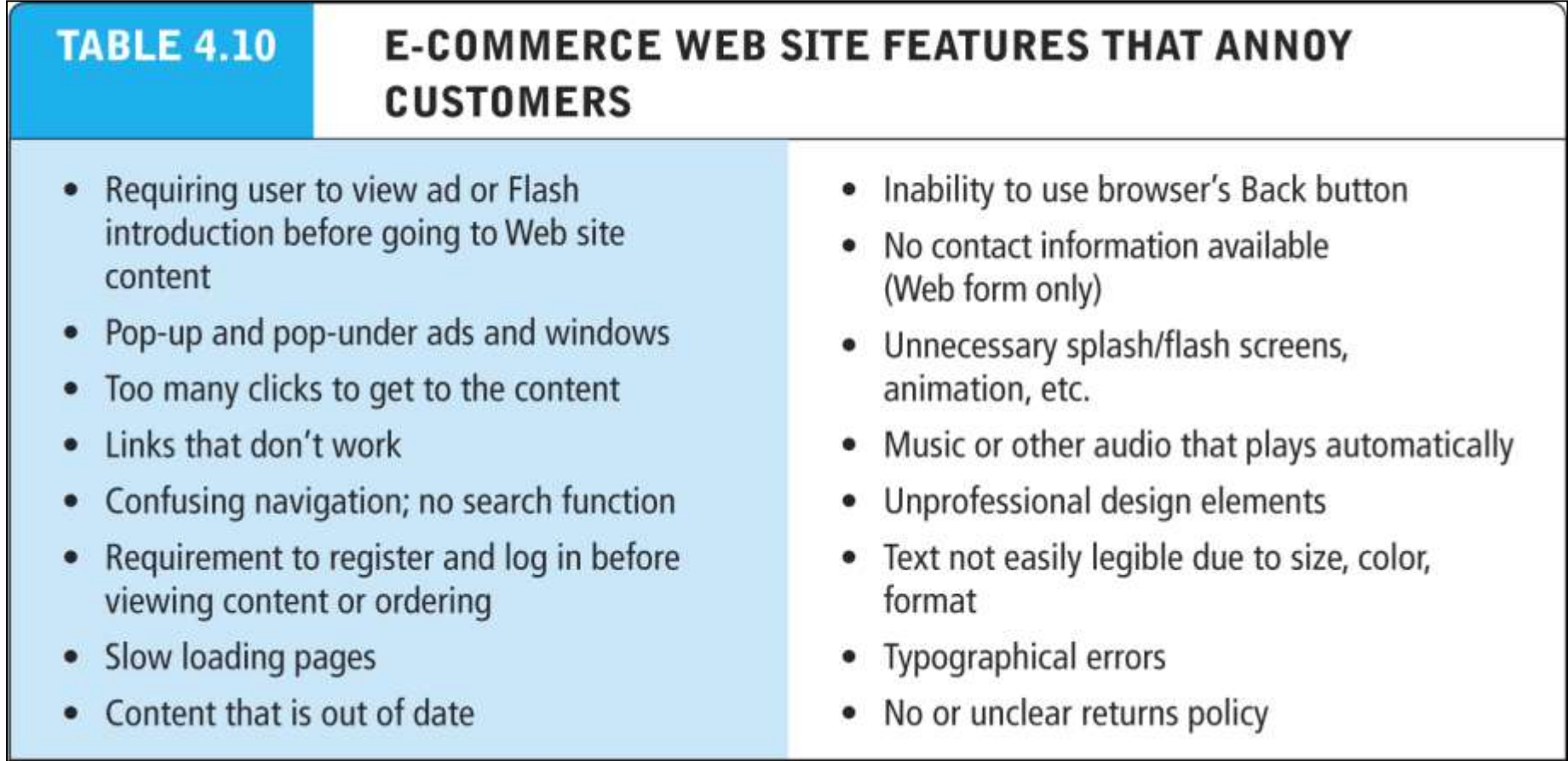
Other E-commerce Site Tools

- ## Web site design: Basic business considerations
    - ❖ Enabling customers to find and buy what they need

- ## Tools for Web site optimization
    - ❖ Search engine placement
        - Metatags, titles, content
        - Identify market niches, localize site
        - Offer expertise
        - Links
        - Search engine ads
        - Local e-commerce

TABLE 4.10   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 4.10, Page 232

TABLE 4.11	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 fool-proof 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 4.11, Page 233

Tools for Interactivity and Active Content

- **Web 2.0 design elements:**

  - ❖ Widgets, mashups

- **CGI (Common Gateway Interface)**

- **ASP (Active Server Pages)**

- **Java, JSP, and JavaScript**

- **ActiveX and VBScript**

- **ColdFusion**

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 affectively access site

Designing for Accessibility

- **Why might some merchants be reluctant to make their Web sites accessible to disabled Americans?**

- **How can Web sites be made more accessible?**

- **Should all Web sites be required by law to provide "equivalent alternatives" for visual and sound content?**

- **What additional accessibility problems do mobile devices pose?**

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 mobile presence**
  - ❖ Use systems analysis/design to identify unique and specific business objectives

TABLE 4.13	UNIQUE FEATURES THAT MUST BE TAKEN INTO ACCOUNT WHEN DESIGNING A MOBILE WEB 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.

Table 4.13, Page 243

Developing a Mobile Web Presence

- **Design considerations**
  - ❖ Platform constraints: Smartphone/tablet

- **Performance and cost**
  - ❖ Mobile Web site:
    - Least expensive
  - ❖ Mobile app:
    - Can utilize browser API
  - ❖ Native app:
    - Most expensive; requires more programming

Building a Mobile Presence

- **What are the key differences between user experience on a Web site and on a mobile device?**

- **Why would a mobile Web site or app from the same merchant need different content or functionality?**

- **In which cases would a merchant want to develop a mobile app over a mobile Web site?**

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