



Building an E-commerce Presence





Imagine Your E-commerce Presence

■ What's the idea?

- ❖ Vision
 - ❖ Mission statement
 - ❖ Target audience
 - ❖ Intended market space
 - ❖ Strategic analysis
 - ❖ Marketing matrix
 - ❖ Development timeline
 - ❖ 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 (social networks)

❖ 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

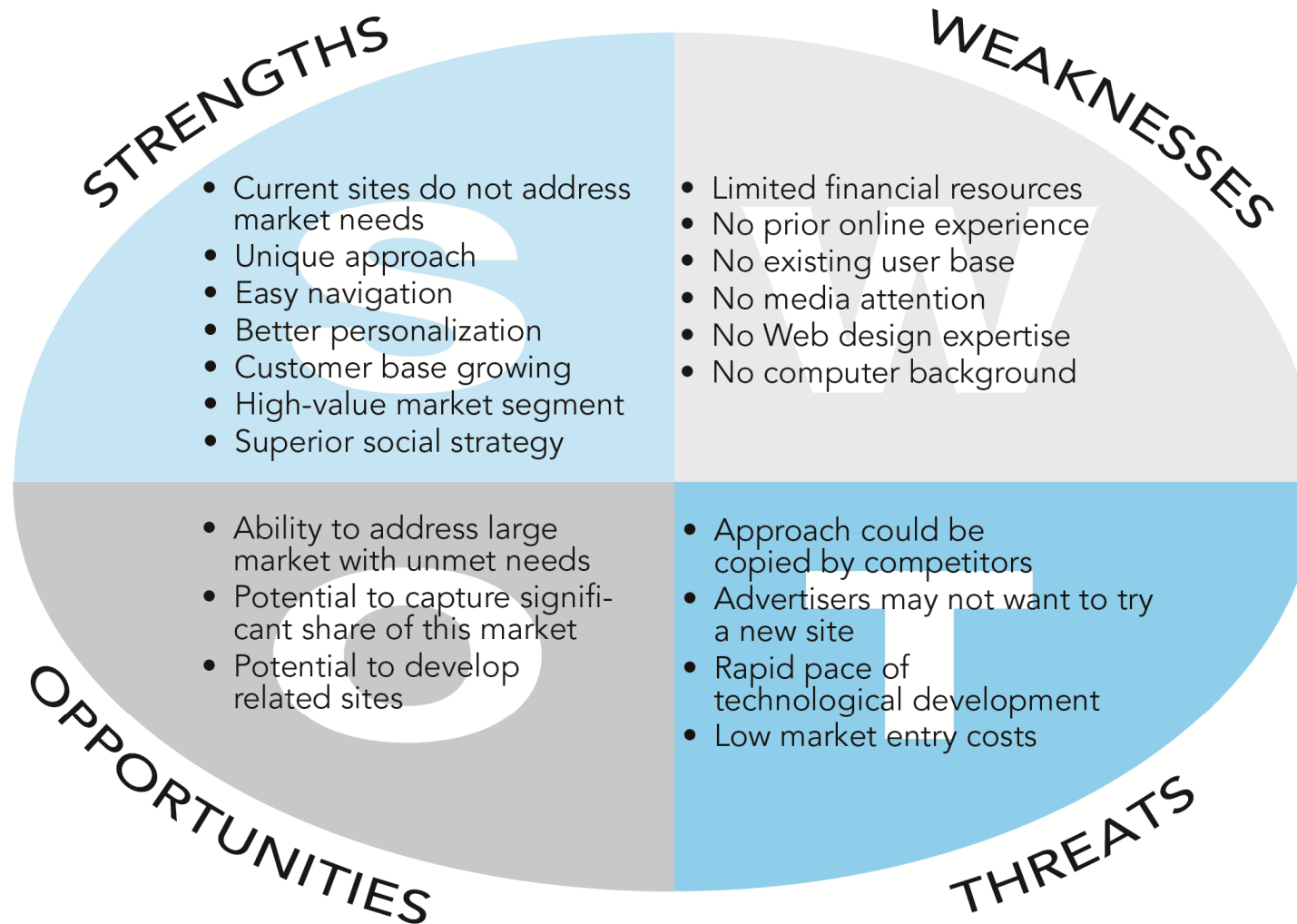


Figure 3.1, page 177

E-commerce Presence Map

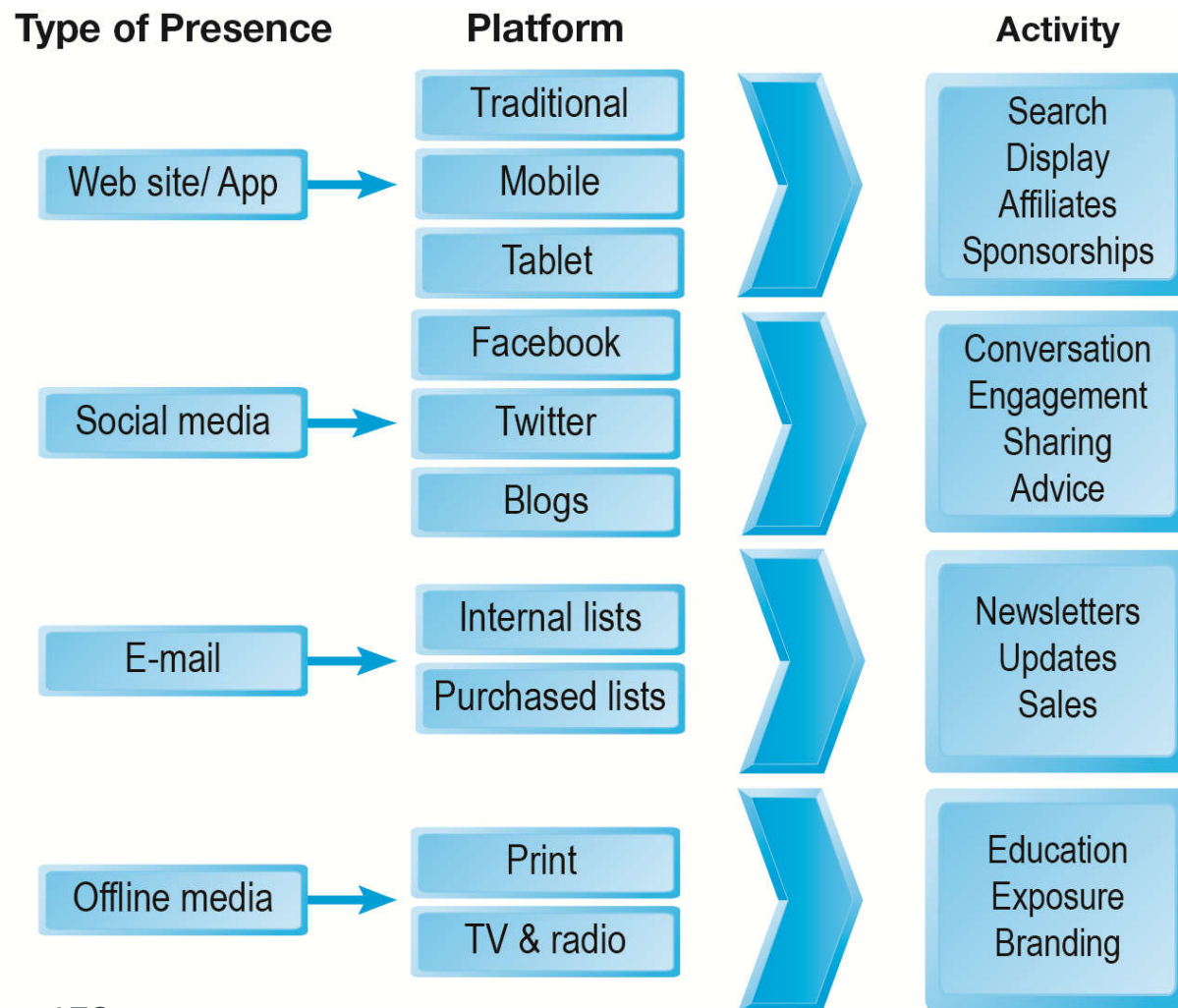



Figure 3.2, page 178




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

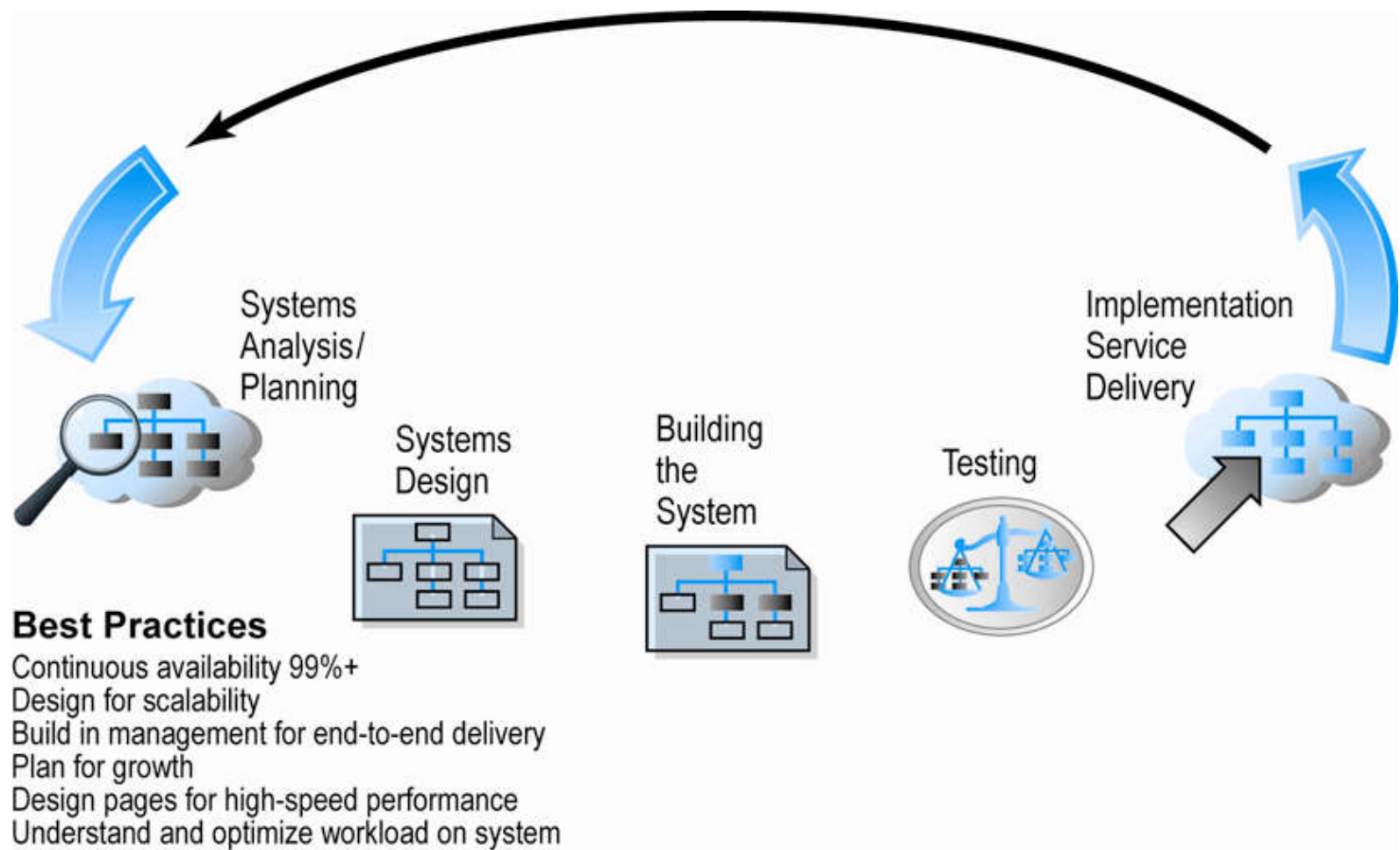


Figure 3.5, Page 182



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 3.2

SYSTEM ANALYSIS: BUSINESS OBJECTIVES, SYSTEM FUNCTIONALITIES, 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 3.2, page 183





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:

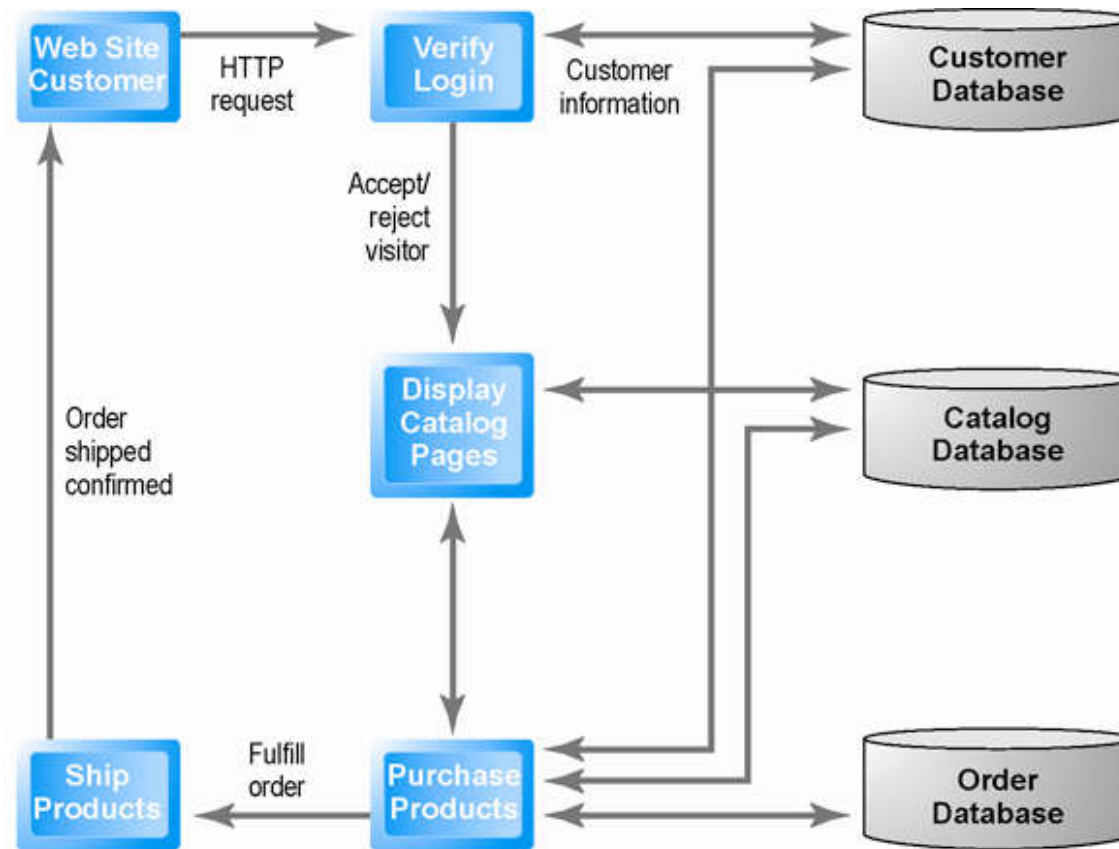
- ❖ Logical design

- Data flow diagrams, processing functions, databases

- ❖ Physical design

- Specifies actual physical, software components, models, and so on
- 

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

Physical Design for a Simple Web Site

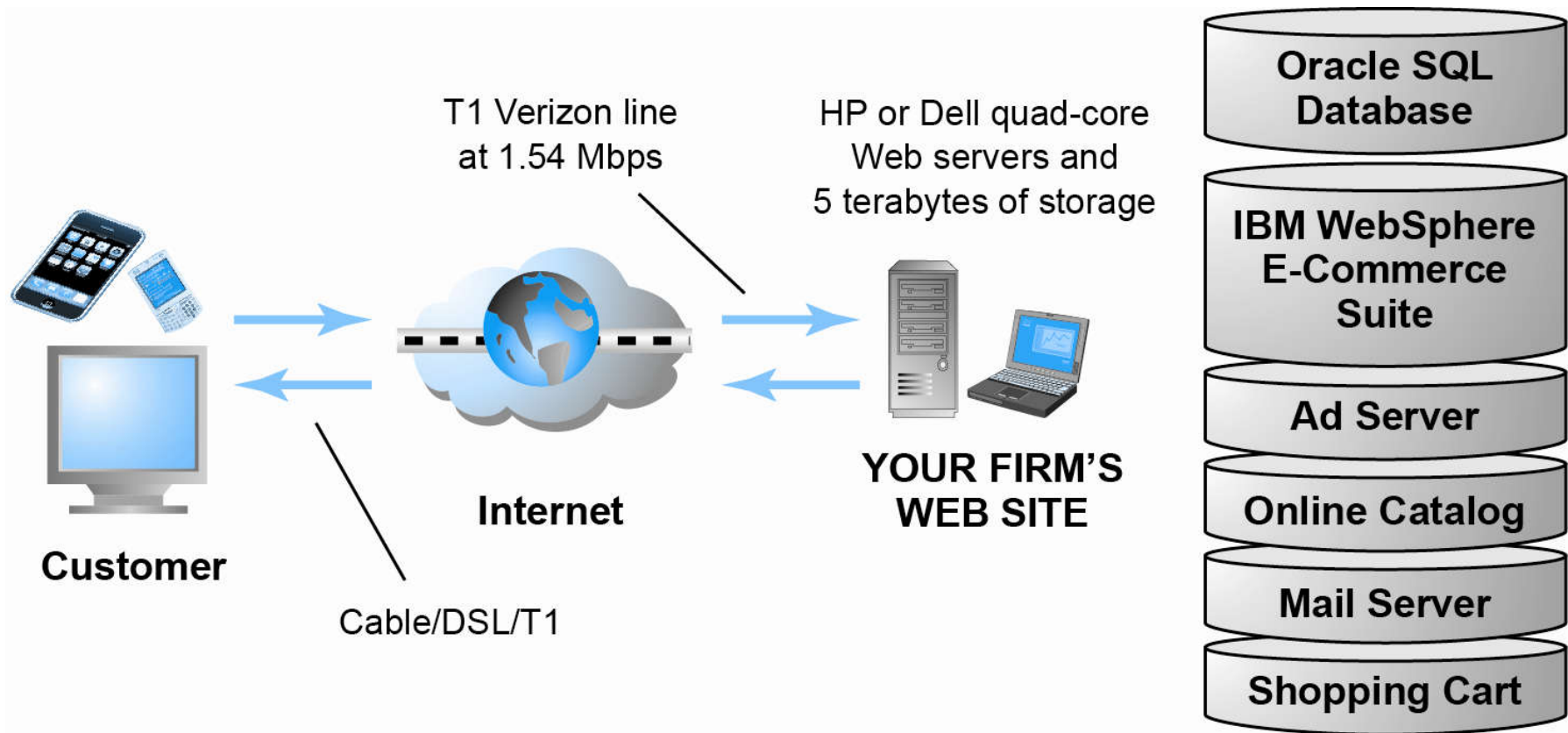



Figure 3.6 (b), Page 185



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

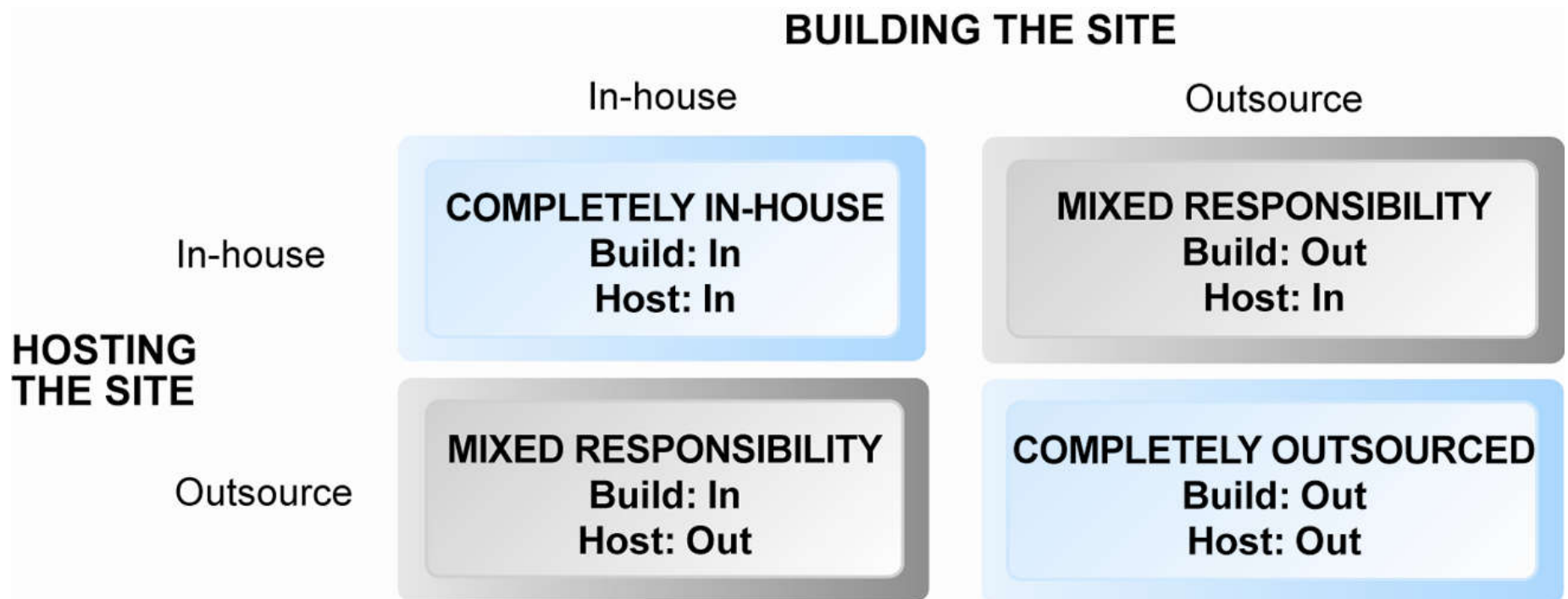



Figure 3.7 Page 186

Weebly Makes Creating Web Sites Easy

- **What value does Weebly offer to small businesses?**
 - **Are there any drawbacks to using Weebly to create an e-commerce presence?**
 - **How are service providers like Weebly changing the nature of 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
- 

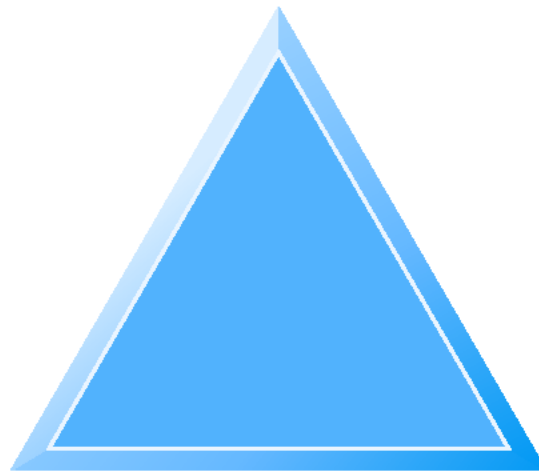
Factors in Web Site Optimization

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



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

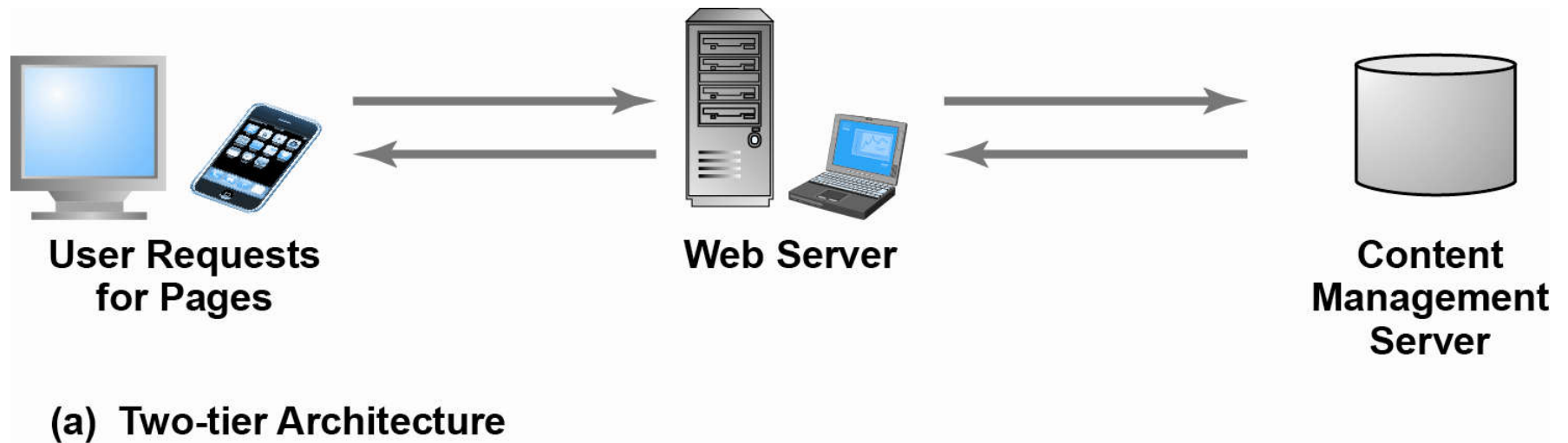


Figure 3.11(a), Page 195

Multi-Tier E-commerce Architecture



(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
- 



Dynamic Page Generation Tools


■ Dynamic page generation:

- ❖ Contents stored in database and fetched when needed

■ Common tools:

- ❖ CGI, ASP, JSP, ODBC, JDBC


■ 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, including (m-commerce)
 - ❖ 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
- 



Web Services and Open-Source Options

■ Options for small firms

- ❖ Hosted e-commerce sites
 - Offer site building tools and templates
 - Example: Yahoo's Stores Professional
- ❖ Open-source merchant server software
 - Enables you to build truly custom sites
 - Requires programmer with expertise, time





Choosing Hardware


■ **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 3.8 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 3.8, Page 207



**TABLE 3.9****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.



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
 - Buy ads
 - Local e-commerce
- 



TABLE 3.10	E-COMMERCE WEB SITE FEATURES THAT ANNOY CUSTOMERS
<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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 3.10, Page 209



**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
- 

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
 - ❖ Hybrid app
 - Runs inside native container
 - App distribution
 - Based on HTML5, CSS, Javascript
- 



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.

Table 3.13, Page 220





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
- 

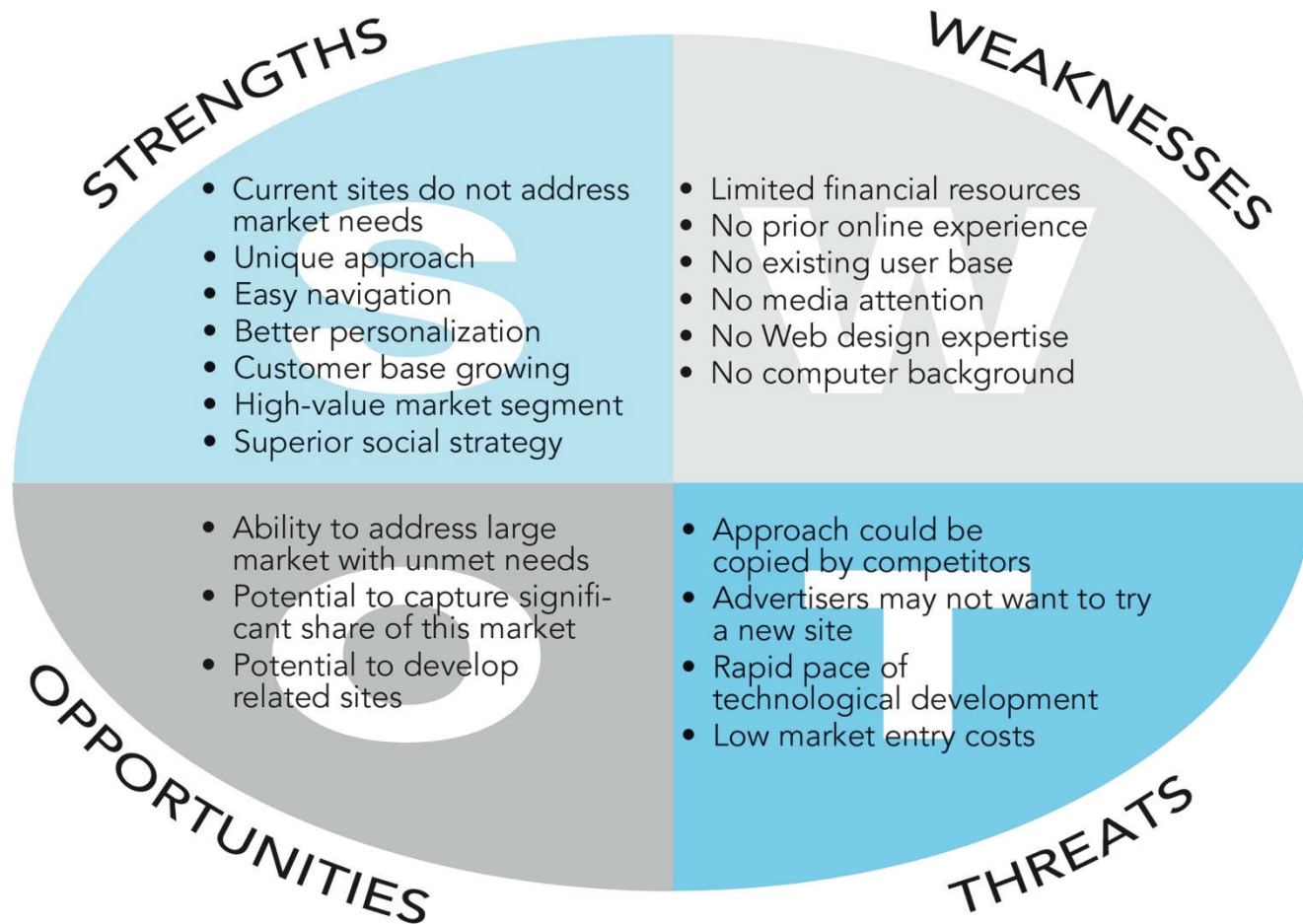
Building a Mobile Presence

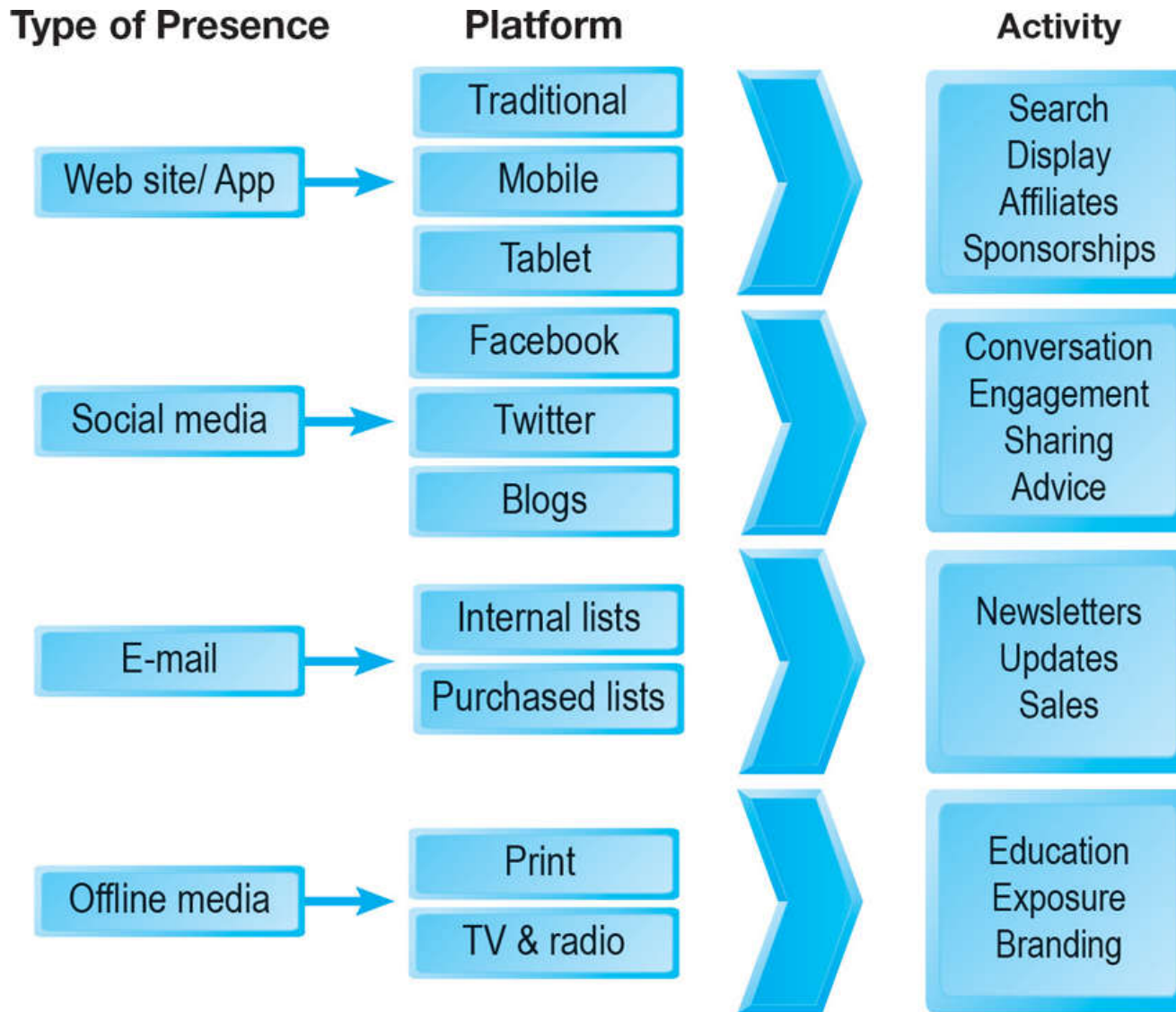
- **What are the key differences between user experience on a Web site and on a mobile device?**
 - **Why would a mobile Web site or app from the same merchant need different content or functionality?**
 - **In which cases would a merchant want to develop a mobile app over a mobile Web site?**
- 

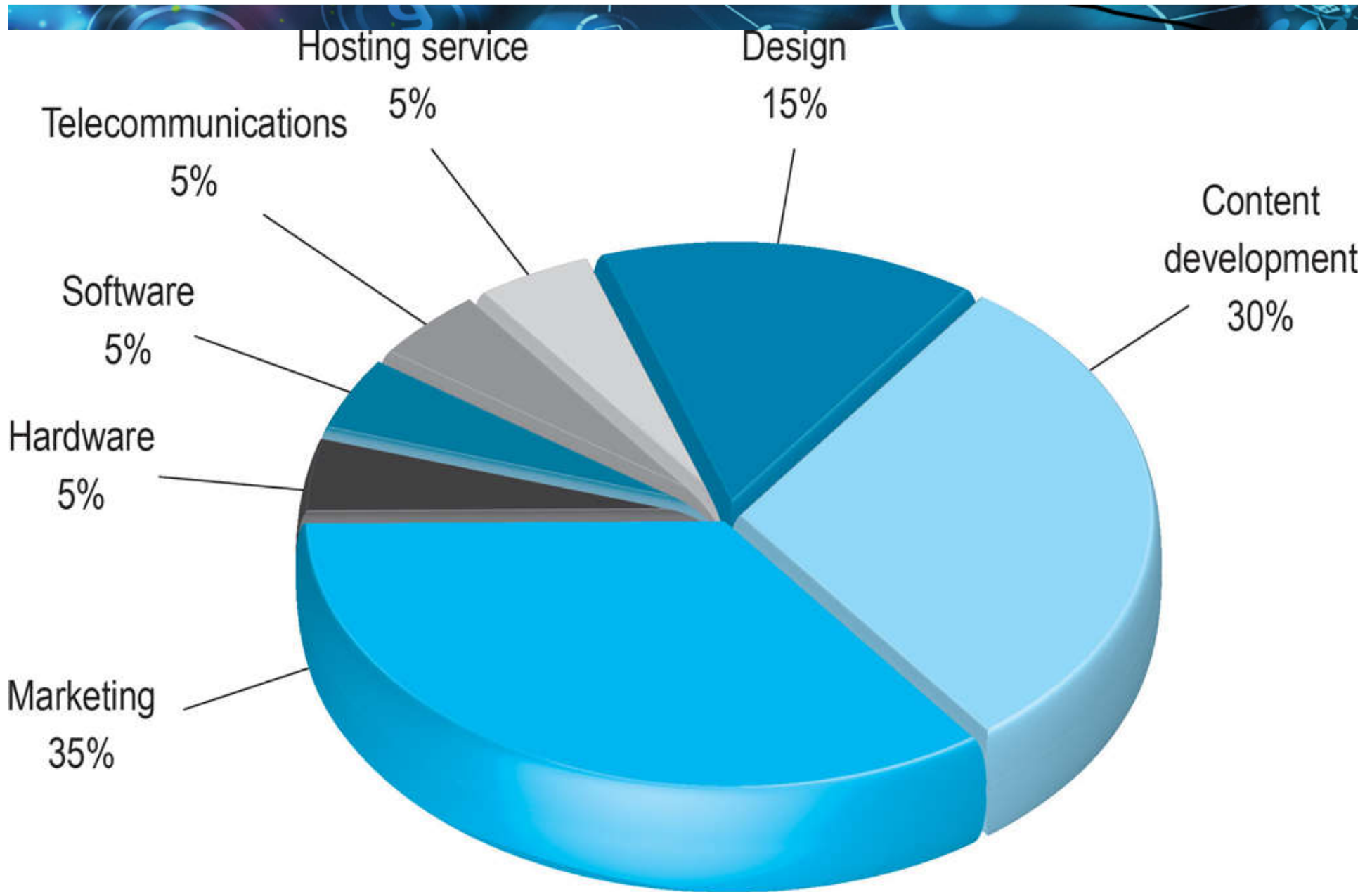


This work is provided solely for the use of instructors in teaching their courses and assessing student learning. Dissemination or sale of any part of this work (including on the World Wide Web) will destroy the integrity of the work and is not permitted. The work and materials from it should never be made available to students except by instructors using the accompanying text in their classes. All recipients of this work are expected to abide by these restrictions and to honor the intended pedagogical purposes and the needs of other instructors who rely on these materials.





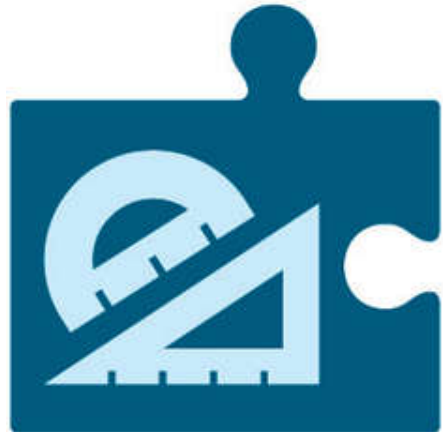
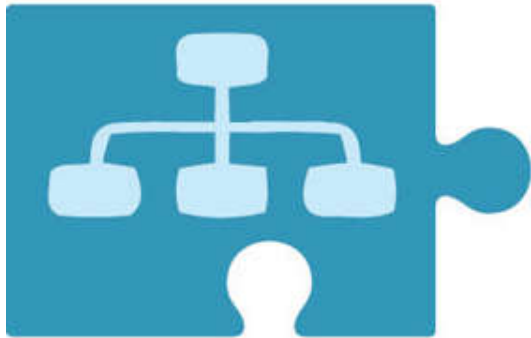




Copyright © 2015 Pearson Education, Inc.

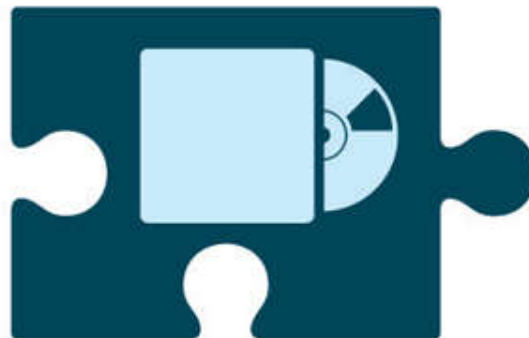


Management



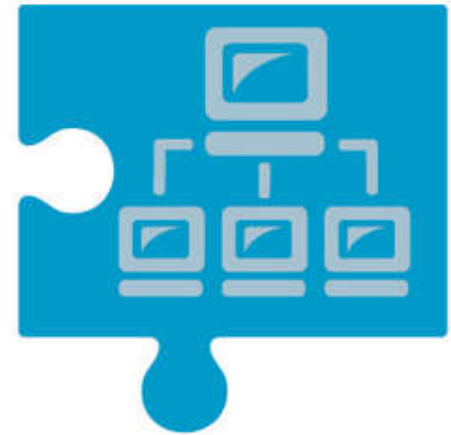
Design

Software



Telecommunications

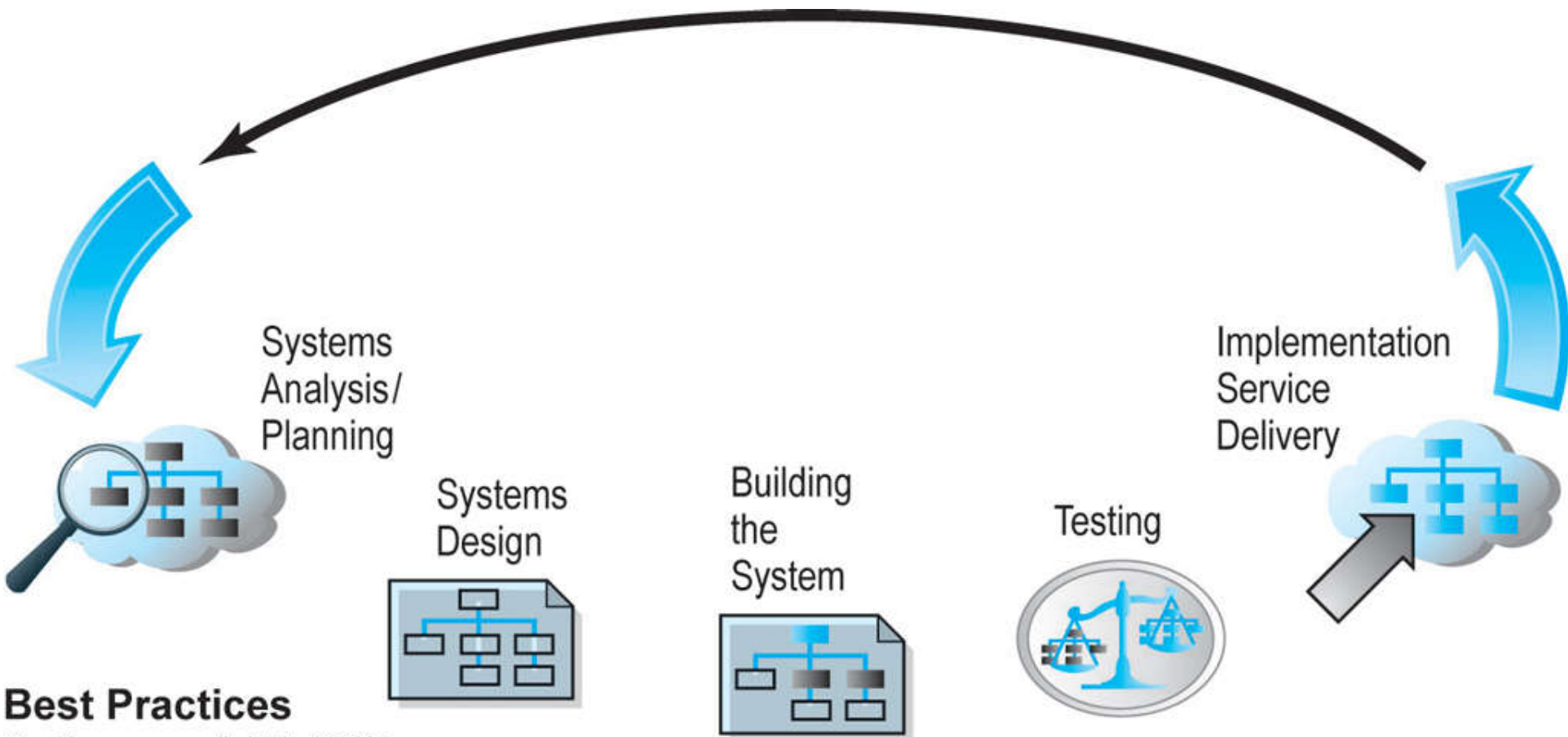
**Hardware
architecture**



Human resources

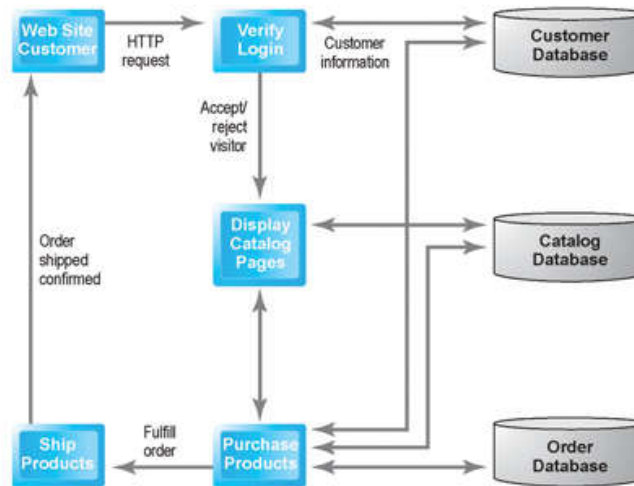
Copyright © 2015 Pearson Education, Inc.





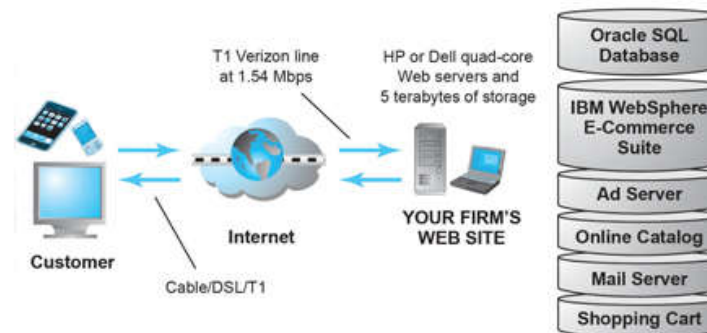
Best Practices

- 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



(a) Simple Data Flow Diagram.

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



(b) Simple Physical Design.

A physical design describes the hardware and software needed to realize the logical design.



BUILDING THE SITE

In-house

Outsource

In-house

COMPLETELY IN-HOUSE
Build: In
Host: In

MIXED RESPONSIBILITY
Build: Out
Host: In


**HOSTING
THE SITE**

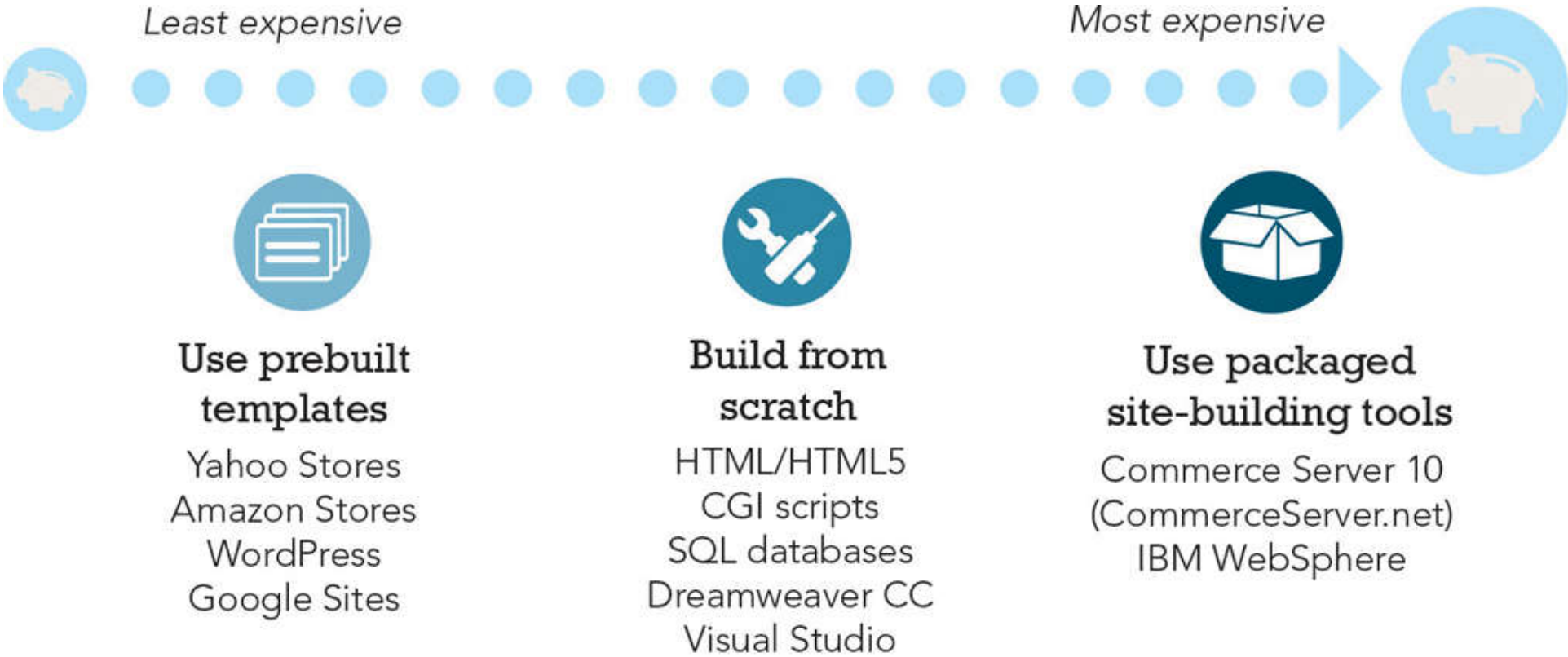
Outsource

MIXED RESPONSIBILITY
Build: In
Host: Out

COMPLETELY OUTSOURCED
Build: Out
Host: Out

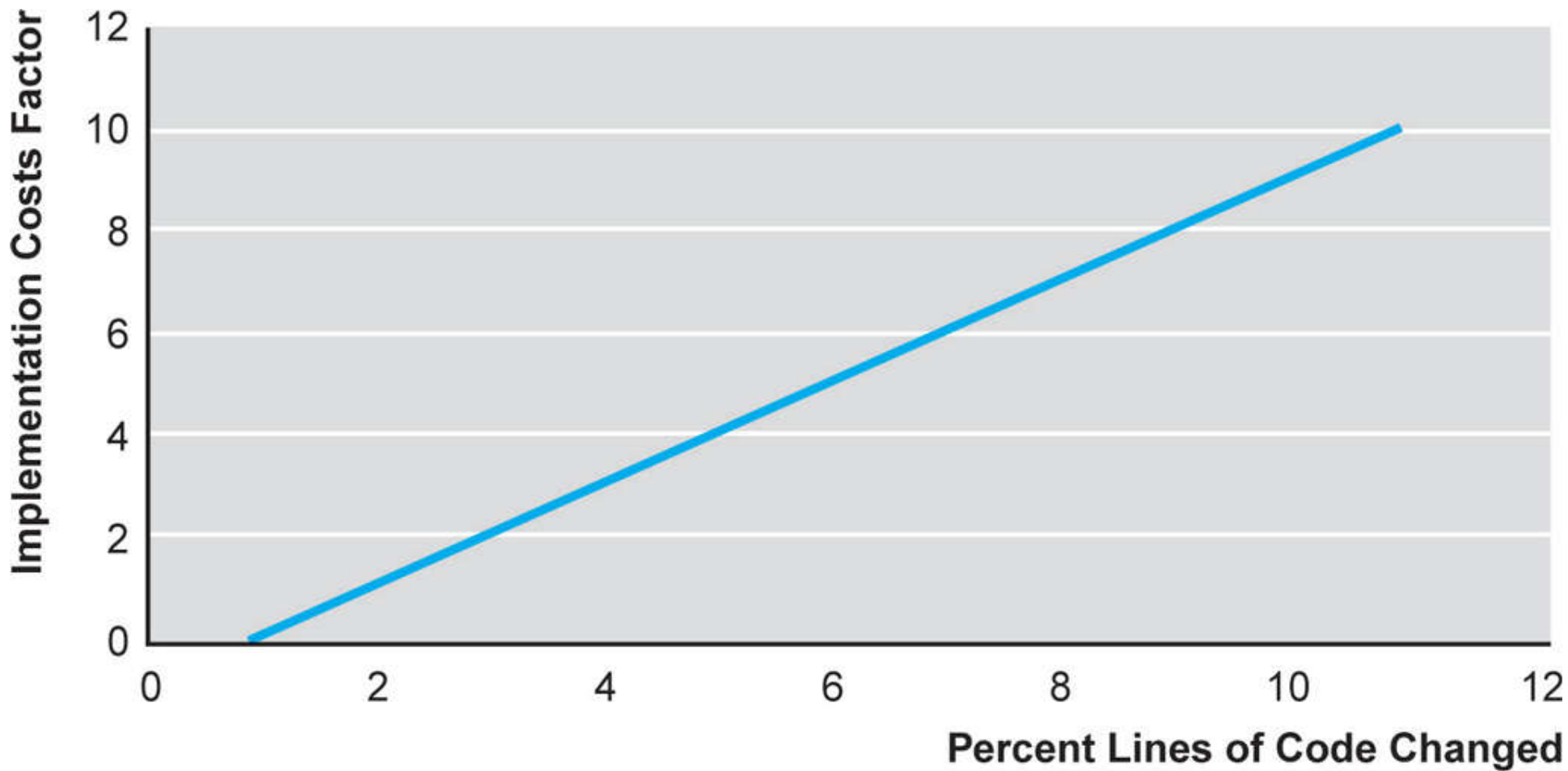
Copyright © 2015 Pearson Education, Inc.





Copyright © 2015 Pearson Education, Inc.





Copyright © 2015 Pearson Education, Inc.



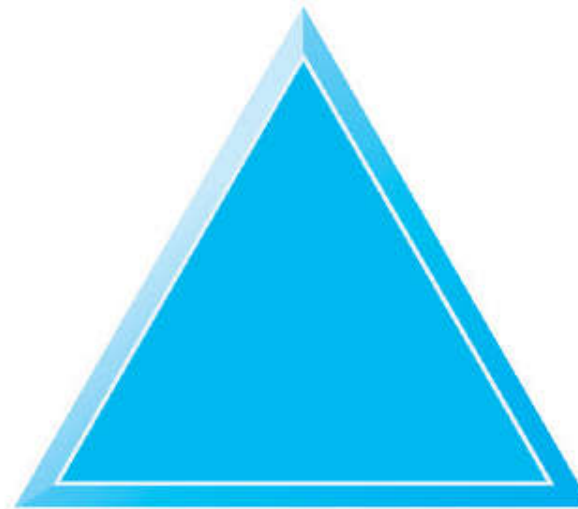


Page Delivery

Content delivery networks
Edge caching
Bandwidth

Page Generation

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

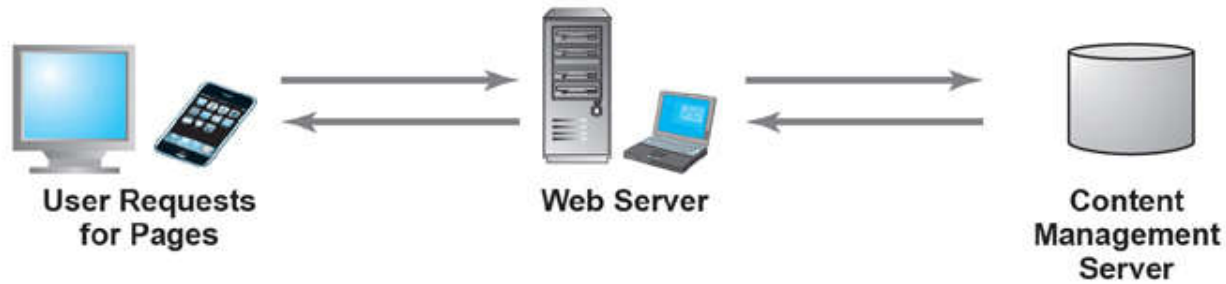


Page Content

Optimize HTML
Optimize images
Site architecture
Efficient page style

Copyright © 2015 Pearson Education, Inc.





(a) Two-tier Architecture

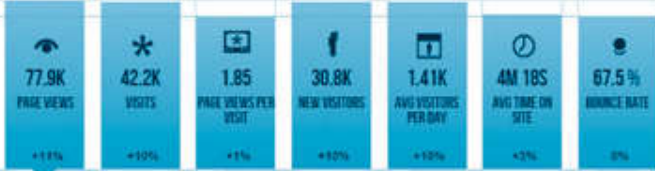
In a two-tier architecture, a Web server responds to requests for Web pages and a database server provides backend data storage.



(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.

Webtrends.com



Monday, Sep 29, 2014 3,735 Monday, Sep 01, 2014 2,056 Up 82%



Countries

153 COUNTRIES

USA	59%	+0%	CAN	3%	+0%
GBR	9%	+20%	DEU	2%	+111%
IND	4%	-1%	Other	24%	+13%



Search

Engine	Visits	Change
Google	5.79K	+12%
Google UK	1.92K	+28%
Google India	943	+0%
Bing	548	+23%
Google Canada	500	+24%



Content

Traffic Sources	Visits	Change	Entry Pages	Visits	Change	Exit Pages	Visits	Change
Unknown Referrer	20.5K	+8%	Web Analytics [...]	32.0K	+11%	Web Analytics [...]	23.6K	+12%
Organic Search	13.1K	+16%	Multi Channel D...	1.22K	+7%	Web Analytics [...]	3.42K	+10%
Referring Sites	7.50K	+4%	Online Support ...	672	-11%	Multi Channel D...	1.73K	+8%
Paid Search	773	+3%	Privacy Stateme...	577	+3500%	Company Profile...	988	+8%
Other Campaigns	99	-23%	Company Profile...	482	+0%	Global Office L...	435	+154%

