

Chapter 4:

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

Dr. N. Abdolvand

E-Business

1

Learning outcomes

- ◆ Understand the steps in developing e-commerce presence
- ◆ Explain the process that should be followed in building an e-commerce presence.
- ◆ Identify major considerations involved in choosing web server and e-commerce merchant server software
- ◆ Understand issues involved in choosing the most appropriate hardware for an e-commerce site
- ◆ Identify additional tools that can improve website performance

Dr. N. Abdolvand 2

2

Insight on Technology: Class Discussion

- ◆ 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?

Dr. N. Abdolvand 3

3

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

Dr. N. Abdolvand 4

4

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

Dr. N. Abdolvand 5

5

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

Dr. N. Abdolvand 6

6

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?

Dr. N. Abdolvand 7

7

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

Dr. N. Abdolvand 8

8

E-commerce Presence Map

Type of Presence	Platforms	Activity
Web sites	Traditional Mobile Tablet	Search Display Influencer Sponsorship
E-mail	Electronic Push-based lists	Newsletters Direct Sales
Social media	Facebook Twitter Sligo	Conversation Engagement Posting Active
Offline media	Print TV & radio	Education Exposure Branding

Figure 4.2, page 194
Dr. N. Abdolvand 9

9

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

Dr. N. Abdolvand 10

10

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

Dr. N. Abdolvand 11

11

Web Site Systems Development Life Cycle

Best Practices
Continuous availability (24x7)
Design for scalability
Build in management for end-to-end delivery
Plan to grow
Design steps for high-speed performance
Customized and optimize workflow in system

Figure 4.5, Page 199 Copyright © 2014 Pearson Education, Inc. Publishing as PrenticeHall
Dr. N. Abdolvand 12

12

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

Dr. N. Abdolvand 13

13

Business Objective	System Functionality	User Product Capabilities
Manage product information	Product catalog	Search, filter, product listing
Manage customer orders	Order processing	Product selection, ordering, checkout, tracking, return
Manage customer interaction	Customer relationship management	Site layout, user interface, user rating capability, feedback, customer support, and personalized experience
Manage customer retention	Website design	Software development, user interface design, content management
Manage customer support	Shipping and payment system	Secure credit card handling, shipping, payment options
Manage customer information	Customer database	Secure, efficient, storage, retrieval for all customers, online customer registration
Provide alternate customer support	Self-Service	Customer to product, item, payment, shipment data
Provide customer support	Website content management	Web publishing, content management, website design, website management
Understand marketing effectiveness	Site tracking and reporting system	Monitor website usage, page views, search, and purchase, identify, marketing campaign
Provide product and supplier data	Inventory management system	Product information, inventory, supplier and customer order processing, bill of material

Table 4.2, page 200
Dr. N. Abdolvand 14 Copyright © 2014 Pearson Education, Inc. Publishing as PrenticeHall

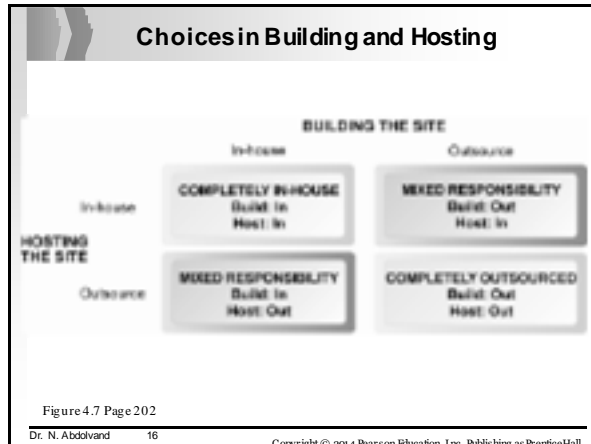
14

Build/Host Your Own vs. Outsourcing

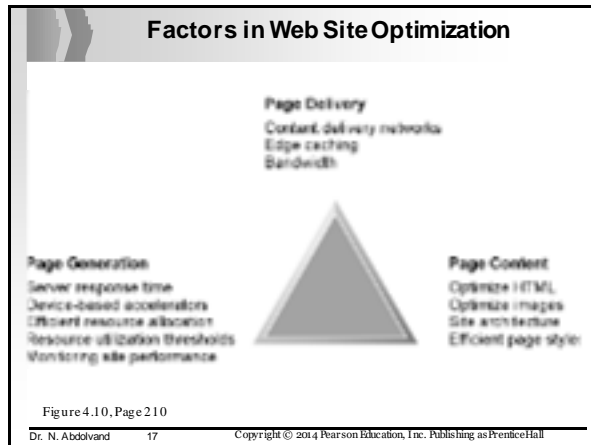
- ◆ Outsourcing: Hiring vendors to provide services involved in building site
- ◆ Build own vs. outsourcing:
 - Build your own requires team with diverse skill set; choice of software tools; both risks and possible benefits
- ◆ Host own vs. outsourcing
 - **Hosting:** Hosting company responsible for 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

Dr. N. Abdolvand 15

15



16



17

- ### 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
- Dr. N. Abdolvand 18

18

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)

Dr. N. Abdolvand 19

19

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

Dr. N. Abdolvand 20

20

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

Dr. N. Abdolvand 21

21

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

Dr. N. Abdolvand 22

22

Web Services and Open-Source Options

- ◆ Options for small firms
 - Hosted e-commerce sites
 - Offer site building tools and templates
 - Example: Yahoo's Merchant Solutions
 - Open-source merchant server software
 - Enables you to build truly custom sites
 - Requires programmer with expertise, time

Dr. N. Abdolvand 23

23

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

Dr. N. Abdolvand 24

24

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

Dr. N. Abdolvand 25

25

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**

Dr. N. Abdolvand 26

26

TECHNIQUE	APPLICATION
Use a faster computer	Deploy edge servers, presentation servers, data servers, etc.
Create a cluster of computers	Use computers in parallel to handle load.
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	Facilitate connections between processes and computers to a minimum.
Aggregate user data	Aggregate user data from legacy applications to single data pools.
Cache	Store frequently used data in cache rather than on the disk.

Table 4.8, Page 222
Dr. N. Abdolvand 27

27

ARCHITECTURE IMPROVEMENT	DESCRIPTION
Separate static content from dynamic content	Use specialized servers for each type of workload.
Cache static content	Increase RAM to the proxy to cache 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 activities on dedicated servers.
Optimize ASP code	Examine your code to ensure it is operating efficiently.
Optimize the database servers	Examine your database search times and take steps to reduce access times.

Table 4.9, Page 224
Dr. N. Abdolvand 28

28

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 engines
 - Local e-commerce

Dr. N. Abdolvand 29

29

<ul style="list-style-type: none"> • Requiring user to view ad or flash content before going to Web site content • Pop-up and pop-under ads and windows • Necessary 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 see browser's Back button • No contact information available (Web form only) • Unnecessary upgrade/look screens, warnings, etc. • Music or other audio that plays automatically • Unprofessional design elements • Unreadable, illegible due to low color contrast • Typographical errors • No or unclear return policy
--	---

Table 4.10, Page 225
Dr. N. Abdolvand 30 Copyright © 2014 Pearson Education, Inc. Publishing as PrenticeHall

30

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, all-over-the-place graphics and sounds that the user cannot control.
Legible text	Avoids backgrounds that distract text or make it illegible.

Table 4.1.1, Page 226
 Dr. N. Abdolvand 31 Copyright © 2014 Pearson Education, Inc. Publishing as PrenticeHall

31

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

Dr. N. Abdolvand 32

32

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

Dr. N. Abdolvand 33

33

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

Dr. N. Abdolvand 34

34

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 modes different from the traditional mouse and keyboard. The mobile platform is not a good data entry tool but can be a great navigation tool.

Table 4.13, Page 237
Dr. N. Abdolvand 35

35

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

Dr. N. Abdolvand 36

36



37

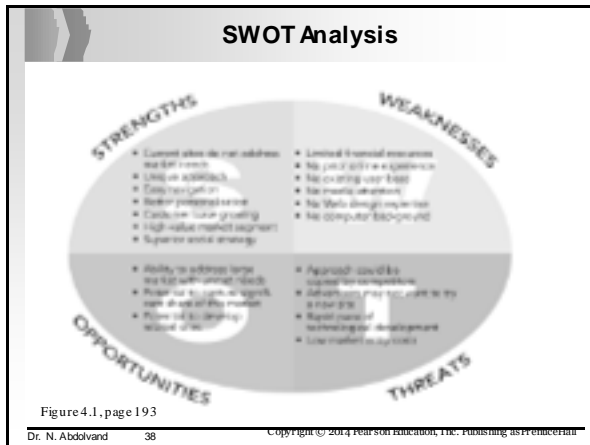


Figure 4.1, page 193

Dr. N. Abdolvand 38 Copyright © 2014 Pearson Education, Inc. Publishing as Prentice Hall

38

**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

Dr. N. Abdolvand 39

39

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

Dr. N. Abdolvand 40

40

Logical Design for a Simple Web Site

A Simple Data Flow Diagram
The data flow diagram illustrates the flow of information requests and responses in a simple Web site.

Figure 4.6 (a), Page 201
Copyright © 2004 Pearson Education, Inc. Publishing as Prentice Hall

41

Physical Design for a Simple Web Site

Figure 4.6 (b), Page 201
Copyright © 2004 Pearson Education, Inc. Publishing as Prentice Hall

42

Testing, Implementation, and Maintenance

- ◆ Testing
 - Unit testing
 - System testing
 - Acceptance testing
- ◆ Implementation and maintenance:
 - Maintenance is ongoing
 - Maintenance costs: Similar to development costs
 - Benchmarking

Dr. N. Abdolvand 43

43

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

Dr. N. Abdolvand 44

44

Two-Tier E-commerce Architecture

The diagram illustrates a two-tier architecture. On the left, a desktop computer and a smartphone are labeled 'User Requests for Pages'. In the center, a server rack is labeled 'Web Server'. On the right, a server rack is labeled 'Content Management Server'. Bidirectional arrows connect the user devices to the web server, and the web server to the content management server.

(a) Two-tier Architecture

Figure 4.11, Page 211
Dr. N. Abdolvand 45 Copyright © 2014 Pearson Education, Inc. Publishing as Prentice Hall

45

Web Server Software

- ◆ Apache
 - Leading Web server software
 - Works with UNIX, Linux operating systems
- ◆ Microsoft's Internet Information Server (IIS)
 - Second major Web server software
 - Windows-based

Dr. N. Abdolvand 46

46

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/Transport Layer Security)	Verify user name 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 engines	Including 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 213
Dr. N. Abdolvand 47

47

Tools for Interactivity and Active Content

- ◆ CGI (Common Gateway Interface)
- ◆ ASP (Active Server Pages)/ASP.NET
- ◆ Java, JSP, and JavaScript
- ◆ ActiveX and VBScript
- ◆ ColdFusion
- ◆ Web 2.0 design elements:
 - Widgets, mashups

Dr. N. Abdolvand 48

48