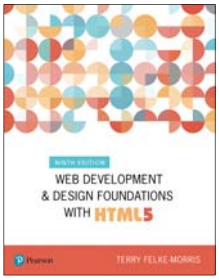
Web Development & Design Foundations with HTML5

Ninth Edition



Chapter 12

E-Commerce Overview

Learning Objectives

12.1 define e-commerce
12.2 identify benefits and risks of e-commerce
12.3 describe e-commerce business models
12.4 describe e-commerce security and encryption
12.5 define Electronic Data Interchange (EDI)
12.6 describe trends and projections for e-commerce
12.7 describe issues related to e-commerce
12.8 describe options for order and payment processing

What is E-Commerce?

- The integration of communications, data management, and security technologies to allow individuals and organizations to exchange information related to the sale of goods and services.
- Major functions of E–Commerce include:
  - the buying of goods,
  - the selling of goods, and
  - performance of financial transactions on the Internet.

E-Commerce Advantages for Businesses

- Reduced Costs
- Increased Customer Satisfaction
- More Effective Data Management
- Potentially Higher Sales

E-Commerce Advantages for Consumers

- Convenience
- Easier Comparison Shopping
- Wider Selection of Goods

E-Commerce Risks for Businesses

- Need for a robust, reliable web site
- Fraudulent transactions
- Customer reluctance to purchase online
- Increased competition

E-Commerce Risks for Consumers

- Possible Security Issues
- Possible Privacy Issues
- Purchasing from photos & descriptions
- Possible difficulty with returns

E-Commerce Business Models

- B2C – Business-to-Consumer
- B2B – Business-to-Business
- C2C – Consumer-to-Consumer
- B2G – Business-to-Government

Electronic Data Interchange (EDI)

The transfer of data between different companies using networks.

- Facilitates the exchange of standard business documents including purchase orders and invoices

EDI is not new -- In existence since the 1960s

Trading Partners

- Organizations that exchange EDI transmissions

Newer technologies

- XML and Web Services are replacing traditional EDI
- Provide opportunities to customize secure information exchange over the Internet

E-Commerce U.S. Retail Sales

What do people buy online?

1. Clothing, accessories, and footwear ($58.2 billion)
2. Furniture and home furnishings ($32.4 billion)
3. Electronics and appliances ($30 billion)
4. Sporting goods ($13.1 billion)
5. Books and magazines ($12.6 billion)
6. Toys, hobby goods, and games ($12.1 billion)
7. Office equipment and supplies ($10.6 billion)
8. Food, beer, and wine ($9.8 billion)

2015 Sales Figures
http://www2.census.gov/retail/releases/current/arts/ecommerce4541.xls

Who's on the Internet? (1 of 2)

Table 12.1 Online population

Category	Percentage That Use the Internet
Men	89%
Women	86%
Age: 18-29	99%
Age: 30-49	96%
Age: 50-64	87%
Age: Over 65	57%
Household Income: Less than $30,000	79%
Household Income: $30,000 to $49,999	90%
Household Income: $50,000 to $74,999	95%
Household Income: $75,000 or higher	98%
Education: High school graduate	81%
Education: Some college	94.1%
Education: College graduate	98%

Who's on the Internet? (2 of 2)

- Source: http://www.pewinternet.org/data-trend/internet-use/latest-stats/
- Other Demographics:
  - http://www.pewinternet.org/
  - http://www.clickz.com
  - http://www.census.gov/eos/www/ebusiness614.htm

E-Commerce Issues

- Intellectual Property
- Security
- Fraud
- Taxation
- International Commerce

E-Commerce Security

- Encryption
  - Ensures privacy within an organization and on the Internet.
  - The conversion of data into an unreadable form, called a ciphertext.
- Decryption
  - The process of converting the ciphertext back into its original form, called plaintext or cleartext, so it can be understood.
- The encryption/decryption process requires an algorithm and a key.

E-Commerce Security Encryption Types

Secure E-Commerce transactions use the encryption technologies below:

- Symmetric-key Encryption
- Asymmetric-key Encryption
- Hash Encryption

SSL (Secure Sockets Layer)

- Utilizes these encryption technologies
- Provides for secure transmission of data on the Internet.

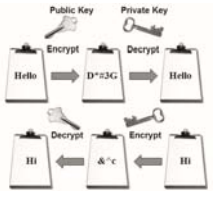
E-Commerce Security: Symmetric-Key

Symmetric-Key Encryption

- Also called single-key encryption
- Both encryption and decryption use the same key
- Both the sender and receiver must know the key before communicating using encryption.
- Advantage: speed

E-Commerce Security: Asymmetric-Key

Asymmetric-Key Encryption



- Also called public-key encryption
- There is no shared secret
- Two keys are created at the same time:
  - Public key
  - Private key
- Asymmetric-key encryption is much slower than symmetric-key encryption.

E-Commerce Security: Hash

Hash Encryption

A hash algorithm transforms a string of characters into a "digest"

- A shorter fixed-length value or key that represents the original string

One-way encryption

Used for information that will not be read or decrypted

Purpose: verify the integrity of information

Secure Sockets Layer (SSL) (1 of 2)

- A protocol that allows data to be privately exchanged over public networks
- Developed by Netscape
- Encrypts data sent between a client (usually a Web browser) and a Web server.
- Utilizes both symmetric and asymmetric keys.
- "https" protocol
- Browsers display a "lock" icon

Secure Sockets Layer (SSL) (2 of 2)

SSL provides secure communication between a client and server by using:

- Server and (optionally) client digital certificates for authentication
- Symmetric-key cryptography using a "session key" for bulk encryption
- Public-key cryptography for transfer of the session key
- Message Digests (hash encryption) to verify the integrity of the transmission

SSL & Digital Certificate

- Digital Certificate
  - A form of an asymmetric key
    - Also contains information about the certificate, the holder of the certificate, and the issuer of the certificate.
  - Used by SSL to authenticate the identity of the web server

Digital Certificate

The contents of a digital certificate include:

- The public key
- Effective date of the certificate
- Expiration date of the certificate
- Details about the Certificate Authority -- the issuer of the certificate
- Details about the certificate holder
- A digest of the certificate content

Certificate Authority

A trusted third-party organization or company that issued digital certificates.

Well-known Certificate Authorities:

Verisign

http://www.verisign.com

Thawte

http://www.thawte.com

Checkpoint 12.1

1. Describe three advantages of e-commerce for an entrepreneur just starting a business.
2. Describe three risks that businesses face when engaging in e-commerce.
3. Define SSL. Describe how an online shopper can tell that an e-commerce site is using SSL.

Order & Payment Processing

E-Commerce Payment Methods:

- Credit Card
- Stored-value Card
- Smart Card
- Digital Cash

E-Commerce Storefront Solutions

- Instant Online Storefront
  - Shopify, BigCommerce
- Off-The-Shelf Shopping Cart Software
  - Agoracart, osCommerce, ZenCart
- Custom Built Solution
  - IBM's WebSphere Commerce Suite, Microsoft's Commerce Server
  - Microsoft Visual Studio, Adobe Dreamweaver
- Semi-Custom Built Solutions on a Budget
  - Paypal order processing
  - Free shopping cart scripts

Checkpoint 12.2

1. List three payment methods commonly used on the Web.
2. Have you purchased online? If so, think of the last item that you purchased.
   a. Why did you purchase it online instead of at a store?
   b. Did you check to see if the transaction was secure? Why or why not?
   c. How will your shopping habits be different in the future?
3. Describe three types of e-commerce solutions available. Which provides the easiest entry to e-commerce? Explain.

Summary

- This chapter introduced you to basic e-commerce concepts and implementations.
- Consider taking an E-Commerce course in the future to continue your study of this dynamic and growing area of web development.

Copyright