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Electronic commerce

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Introduction to the subject guide

Electronic commerce (or e-commerce) has evolved over the years to become a major channel through which businesses can exchange goods and services, coordinate production and market to customers. By harnessing the power of the internet, electronic commerce has changed the way in which organisations conduct business. The ever-increasing sophistication of websites, intranets and extranets has led to advanced web applications being used to address the needs of customers.

Although the downturn in e-commerce activities at the end of the 20th century led to many new businesses failing, it has subsequently been followed by a second wave of e-commerce that is more international in nature, more dynamic in terms of business and revenue models, and more effective in terms of utilising internet services to address customer needs. Today organisations around the world are using e-commerce to satisfy their communication and business needs. This subject guide is designed to support you when studying the University of London BSc in Computing and Information Systems course unit Electronic Commerce.

The subject guide consists of:

- Extensive study notes on a complete course in e-commerce.
- A set of multiple choice, true / false and essay style questions on each topic covered in the subject guide.
- Sample exam papers to allow you to apply and test the skills and knowledge you have acquired.

In this introductory chapter, the following aspects of the course unit are covered:

- aims, objectives and learning outcomes
- the subject guide content and structure
- course textbook and further reading
- guide to effective study
- assignments and examination.

Aims, objectives and learning outcomes

Aims

The aim of this course is to equip you with a detailed understanding of the major issues regarding the use of electronic commerce applications within business organisations.

Objectives

This course unit focuses on the business, strategic and technical aspects of electronic commerce. It analyses the technologies used, the models designed to make use of such technologies, and the applications that have resulted from their deployment.

The objectives of this subject guide are:

- To define and develop an understanding of the nature, scope and use of electronic commerce applications.
- To define and develop an understanding of the role of internet technologies.
- To enable you to apply electronic commerce business models to real-world scenarios.
- To equip you with the necessary skills to analyse case studies and discuss important issues relating to the development of electronic commerce.
- To enable you to gain an understanding of how to design, engineer and implement electronic commerce applications.

- To equip you with an understanding of the security, legal and ethical issues related to electronic commerce.

In meeting these objectives answers are given to the following questions:

- What are the key differences between the first and second wave of e-commerce?
- What is the definition of electronic commerce and how is it used?
- What constitutes the technology infrastructure of the internet and the World Wide Web?
- What are the emerging Revenue Models and techniques for building a Web Presence?
- How are electronic commerce businesses marketing on the Web?
- What Business-to-Business Strategies are companies using to conduct electronic commerce?
- What is required to design and engineer Online Auctions, Virtual Communities, and Web Portals?
- What is required to design and engineer electronic commerce applications?
- What are the legal and ethical implications when using electronic commerce applications?
- What are the major security threats to electronic commerce businesses and their customers?
- What are the likely future scenarios for electronic commerce?

Learning outcomes

Having mastered the material in, and referenced by, this subject guide, you will be able to:

- Define and understand the nature, scope and use of a wide variety of electronic commerce applications.
- Define and understand the role of internet technologies in electronic commerce.
- Understand and apply electronic commerce business models to real-world scenarios.
- Analyse case studies and conduct online research into electronic commerce.
- Manage the design, engineering and implementation of electronic commerce applications.
- Understand and apply the security, legal and ethical issues that may arise when using internet technologies.

The subject guide

This subject guide is designed to help you learn. Like an interactive tutor, it will identify those issues that are important and the problems you will encounter as you study this course unit. This subject guide is in no way a substitute for the recommended course text-book which is detailed below. Rather, it aims to highlight particular areas of study and to provide you with supplementary study material to assist your learning.

The subject guide is divided into 10 chapters, each of which may be viewed as a distinct but inter-related area of study. Each chapter is supported by a set of student notes, short study questions, full chapter review questions and solutions. Each chapter also contains a set of discussion topics, case studies and online learning assignments.

The subject guide is divided into the following chapters:

1. Introducing electronic commerce

In this chapter, you will discover what makes electronic commerce different from more traditional forms of commerce, its advantages and disadvantages and how the international growth of the internet and the world wide web (WWW) have stimulated a global commercial environment now being exploited by firms engaged in electronic commerce.

2. Technology infrastructure: the internet and the world wide web

This chapter will give you a broad understanding of the internet technologies upon which electronic commerce, in all its forms, is based today. It will be an important foundation, since it introduces many of the concepts and ideas which will be discussed in greater detail later in the course.

3. Selling on the web: revenue models and building a web presence

In this chapter you will learn how to create an effective web presence for an electronic commerce application. It covers the ways in which online consumers can be identified and reached, the creation and maintenance of brands on the WWW and the business models used for selling products on the WWW.

4. Marketing on the web

In this chapter, you will learn how companies use the web as part of their marketing strategy - to advertise their products and services and promote their reputations. This chapter will also introduce you to some of the ways companies are making money by selling advertising on their websites.

5. Business-to-Business strategies: from electronic data interchange to electronic commerce

This chapter provides an overview regarding the purchasing, logistics and other support activities required to conduct electronic commerce. It outlines the concept of a network organisation that allows businesses to extend beyond their traditional limits in terms of how they are organised. In addition, you will also find details on the use of Electronic Data Interchange (EDI) mechanisms and how these are now being transferred to the internet. Finally, the chapter investigates the nature of supply chain management and the software packages used for business-to-business electronic commerce and supply chain management.

6. Online auctions, virtual communities, and web portals

This chapter outlines differing approaches to establishing WWW based actions and details several WWW auction strategies. This chapter also describes the notion of virtual community and explains how WWW portals may be used to attract online consumers. This chapter highlights how the web enables businesses to achieve activities that are completely new to commerce such as running auctions, creating virtual communities, and operating web portals.

7. The environment of electronic commerce: legal, ethical, and tax issues

In this chapter, you will learn about the international governing aspects of e-commerce. You will be provided with an overview of issues regarding borders, jurisdiction, and website content and how these factors affect a company's ability to conduct electronic commerce. You will also learn about legal issues that arise when the web is used in the commission of crimes, terrorist acts, and even the conduct of war. You will learn about the laws that govern e-commerce activities and the ethical issues that arise when companies conduct e-commerce transactions.

8.   Web server hardware and software

This chapter provides an overview regarding the different types of hardware and software used to design, engineer and implement electronic commerce applications. By the end of this chapter, you should have a good understanding of web server hardware and feature sets with which to develop a successful electronic commerce application, plus a broad knowledge of the tools and performance evaluation criteria on which to base decisions as to how best to maintain and manage the application.

9.   Electronic commerce software

In this chapter, you will learn that whatever the size, most e-commerce projects combine software and tools from different vendors to accomplish their goals. Even small companies rarely use products from a single source, as different software products perform different tasks or processes. This chapter is about which software is most suited to which task, and how different software packages work when integrated together.

10.   Electronic commerce security

This chapter details the security measures that can be employed to reduce or eliminate intellectual property theft. It provides an overview of how to secure client computers from attack by viruses and ill-intentioned programs and scripts downloaded in web pages. This chapter also discusses the role of secure socket layers, secure http, and secure electronic transaction protocols, in protecting electronic commerce websites. This chapter also provides an overview of why secrecy, integrity and necessity are the three core parts of any security program.

Recommended reading

The following section details the books recommended for studying this course unit.

The recommended core textbook for this course unit is:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

This book covers all the major aspects of the second wave of electronic commerce and how it is being used to change the business landscape. The book provides a detailed account of the major issues concerned with the establishment of electronic commerce business applications and explores the core aspects of deploying electronic commerce technologies in real-world situations. This is an excellent book for gaining a comprehensive understanding of electronic commerce and I strongly advise that you read this book in full and use it to accompany this subject guide.

Suggested further reading

Since this is a final year course, it is assumed that you have a familiarity with a wide breadth of ideas drawn from computing and information systems literature. Although this course unit is accompanied by a subject guide including case studies, you should read widely on the subject to gain a complete, balanced understanding of electronic commerce issues. The case studies, study questions and assignments for this course unit are demanding. They will take patience to read and sometimes will require more than one detailed reading to understand the core concepts and ideas that they are trying to portray. Students are strongly advised to read as widely as possible on the subject area of electronic commerce, not only because it is an emerging discipline, but also because many of the concepts it encompasses are challenging. The following books are suggested as further reading to broaden your understanding of the issues relating to electronic commerce.

Electronic Commerce: A Managerial Perspective (Pie) by Efraim Turban , Dave King , Jae Kyu Lee and Dennis Viehland.
Publisher: Prentice Hall; 4 edition (5 Sep 2005) , ISBN-10: 0131854615.

E-Business and E-Commerce Management by Dave Chaffey
Publisher: Financial Times/ Prentice Hall; 3 edition (19 Dec 2006) , ISBN-10: 1405847069.

E-Commerce: Business, Technology, Society by Kenneth Laudon , Carol Traver .
Publisher: Prentice Hall; 3 edition (20 April 2006), ISBN-10: 0131735160.

Electronic Commerce: Principles and Practice by Hossein Bidgoli.
Publisher: Academic Press (8 May 2003) , ISBN-10: 0120959771.

The Complete E-Commerce Book: Design, Build and Maintain a Successful Web-based Business by Janice Reynolds.
Publisher: CMP; 2 edition (30 Mar 2004) , ISBN-10: 1578203120.

Guide to effective study

The role of this subject guide is to complement the recommended textbook and further reading. This subject guide should be viewed as the 'glue' that holds these various information sources together. To study this course unit effectively it is important that you fully understand the complementary nature of this study material. Often, within the guide, you are asked to go online to read further material. Wherever possible, you should do this. This is because questions may be set in the examination paper which rely on your having read widely on the subject area. In other words, this subject guide is not meant to cover everything that the examination may contain. Keep this fact in mind at all times and do not neglect to do the reading assigned at the beginning of each chapter.

This guide is mainly concerned with summarising, highlighting or drawing attention to the points covered in a more exhaustive manner in the recommended reading. The guide can therefore help to concentrate efforts on the major points and issues.

Assignments

This subject guide is supplied with two sample assignments for you to complete. Each assignment is an opportunity for you to apply skills and knowledge acquired during study in a structured manner. Each assignment will require at least 20 hours for reading, preparation and data gathering. You will also be required to display an understanding of technical issues through practical exercises as part of each assignment. These sample assignments are provided to give you an idea of the number and type of questions your actual assignments for this course unit will include.

To achieve a good mark for your assignments, you are required to demonstrate the following:

- Critical reflection in thinking through the issues and effectively constructing appropriate arguments.

- The ability to be able to combine several ideas into a coherent whole.

- A good style of presentation, and the ability to express ideas in a clear and logical manner.

Examination papers

This subject guide is supplied with two sample examination papers. These papers are provided to give you an idea of the number and type of questions that the examination will include.

It should be noted that the sample questions provided at the end of each chapter, and the sample examination paper at the end of this guide are representative, but not comprehensive. It is possible that different kinds of questions on different topics and aspects covered in the guide and in the recommended textbook are asked in the actual examination.

Chapter 1

1   Introducing electronic commerce

Introduction

It is important that you read as widely as possible about the nature and current trends in electronic commerce. It is important that you understand how the development of electronic commerce has led to companies moving much of their business efforts to online environments. This chapter aims to introduce you to the main concepts underpinning electronic commerce today.

In this chapter, you will discover what makes electronic commerce different from more traditional forms of commerce, its advantages and disadvantages and how the international growth of the internet and the world wide web (WWW) has stimulated a global commercial environment which is now being exploited by many firms who are engaged in electronic commerce.

Student reading

It is strongly advised that you now read Chapter 1 of the recommended course text.

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you should be able to:

- Explain what electronic commerce is, and how it is experiencing a second wave of growth.
- Critically discuss why companies are concentrating on revenue models and the analysis of business processes, instead of business models, when undertaking electronic commerce initiatives.
- Explain the economic forces which have created the business environments that have enabled the second wave of electronic commerce.
- Critically analyse the use of value chains and SWOT analysis when identifying e-commerce opportunities.
- Discuss the international nature of e-commerce, and the challenges that arise in engaging on a global scale.

Subject summary

Chapter overview

The business phenomenon that we now call electronic commerce has an interesting history. From humble beginnings in the mid-1990s, electronic commerce grew rapidly until 2000, when a major downturn occurred. Many people have seen news stories about the 'dot-com boom' followed by the 'dot-com bust' or the 'dot-bomb'. In the years 2000 to 2003, many industry observers were writing obituaries for electronic commerce. Just as the unreasonable expectations for immediate success fuelled the high expectations during the boom years, overly gloomy news reports coloured perceptions during this time. Although the rapid expansion and high levels of investment of the boom years are not likely to be repeated, the second wave of electronic commerce is well under way.

The second wave of e-commerce

Electronic commerce, or e-commerce, is now entering what can be described as a second or mature wave. This wave is characterised by the international nature in which e-commerce is being conducted and the reliance on revenue models as opposed to 'good internet ideas'. The 'dot-com' bubble that burst at the end of the late 1990s has led to a revision of the approaches to establishing e-commerce initiatives. Whilst the first wave of e-commerce was dominated by US businesses and was primarily in English, it is now far more common to find e-commerce shoppers interacting with websites in their own languages.

Definition of e-commerce

Although there are many definitions and explanations of e-commerce, the following definition provides a clear distinction. The reader is advised to look at the recommended texts for their interpretations of the following:

- Electronic commerce, or e-commerce, is defined to be the process of businesses trading with other businesses and the formulation of internal processes using electronic links.

- Electronic business, or e-business, is a term often used interchangeably with e-commerce, but is more concerned with the transformation of key business processes through the use of internet technologies.

From your reading it should be apparent to you that electronic commerce is more than online shopping. A more generic definition of electronic commerce would include electronic funds transfers used by many banks as well as business to business communications using the internet, extranet and intranet networks.

Categories of e-commerce

- **Business-To-Business e-commerce**

The largest category of e-commerce is business-to-business (B2B) commerce. This involves companies conducting e-procurement, supply chain management, network alliances, and negotiating purchase transactions over the internet. Businesses use e-commerce to lower transaction costs of conducting business and to make savings in terms of time and effort when conducting business.

- **Business-To-Consumer e-commerce**

Business-to-consumer (B2C) e-commerce involves businesses introducing products and services to consumers via internet technologies. This includes companies selling software and hardware through the internet, taking orders for products that are subsequently delivered to the consumer, and providing digital services such as online magazines and search engines.

- **Business processes**

Business process refers to the use of e-commerce to tailor the internal activities of a business in order to maximise their efficiency and effectiveness. Through the use of e-commerce, businesses can fine-tune supply chains, provide advanced consumer relations management systems, and reduce transaction costs.

- **Consumer-To-Consumer e-commerce**

Consumer-to-consumer (C2C) e-commerce is concerned with the use of e-commerce by individuals to trade and exchange information with other individuals. There has been a huge growth in consumer-to-consumer auctions sites such as e-Bay and sites enabling consumers to offer goods and services to other consumers on an individual basis.

- **Business-To-Government e-commerce**

Business-to-government (B2G) e-commerce is concerned with the need for business to sell goods or services to governments or government agencies. Such activities include supplying the army, police force, hospitals and schools with products and services. Furthermore, businesses will often compete in an online environment for contracts to provide services to the public on behalf of the government. Such services may include the collection of taxes, and the supply of public services.

The table below provides a summary of the different e-commerce categories.

Category	Description	Example
Business-to-business (B2B)	Businesses sell products or services to other businesses.	Grainger.com sells industrial supplies to large and small businesses through its website.
Business-to-consumer (B2C)	Businesses sell products or services to individual consumers.	Tesco.com sells merchandise to consumers through its website.
Business processes that support buying and selling activities	Businesses and other organizations maintain and use information to identify and evaluate consumers, suppliers, and employees. Increasingly, businesses share this information in carefully managed ways with their consumers, suppliers, employees, and business partners.	Dell Computer uses secure internet connections to share current sales and sales forecast information with suppliers. The suppliers can use this information to plan their own production and can thus deliver component parts to Dell in the right quantities at the right time.
Consumer-to-consumer (C2C)	Participants in an online marketplace can buy and sell goods to each other. As businesses also utilise this type, it can be considered a type of B2C e-commerce.	e-Bay is an online commercial marketplace, often using an auction system.
Business-to-government (B2G)	Businesses sell goods or services to governments and government agencies. Can also be considered as part of B2C e-commerce.	CAL-Buy portal for businesses that want to sell online to the State of California.
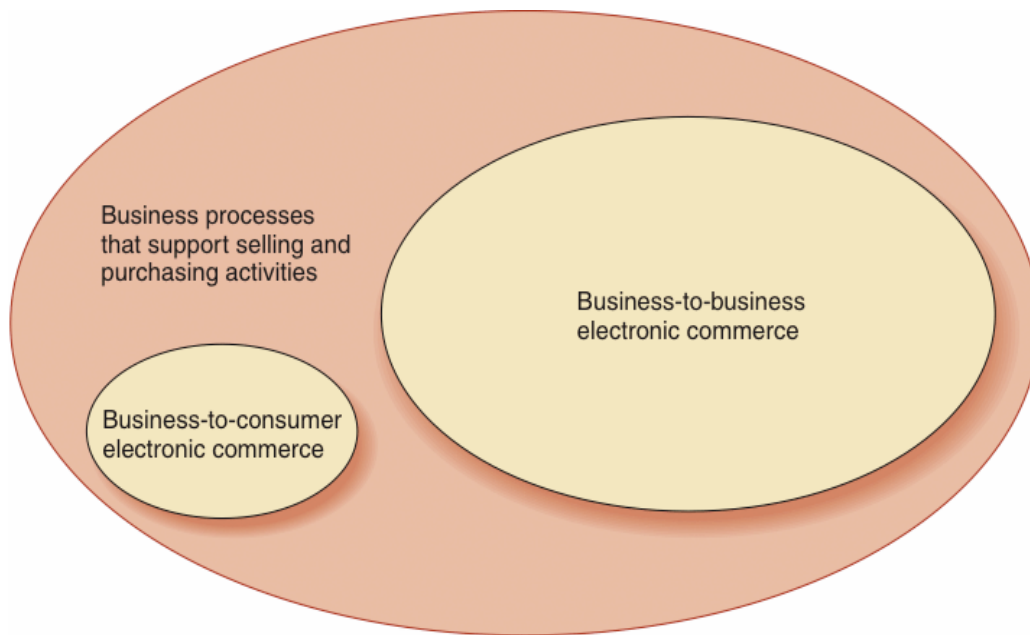
Elements of e-commerce

(Schneider 2007: p.6)

The nature of e-commerce

Three core concepts underpin the nature of e-commerce:

- The management of transactions and transaction costs through the use of online technologies and computerised networks.

- The re-engineering of business processes into logical, related and sequential activities that ensure businesses engage in transactions in the most efficient and effective manner through the use of online technologies and computerised networks.

- The use of information technologies and computerised networks to facilitate employees' tele-commuting or tele-working. Such activities enable flexible working, distributed workforces and efficient productivity paths.

Learning activity

Write a 1,000 word essay on each of the core concepts listed above. These essays should be based on the information found in Chapter 1 of the recommended text, and also Chapters 1 and 2 of the additional text.

The historical development of e-commerce

The use of networks to exchange money and transfers began in the late 1950s with the development of electronic fund transfers (EFTs). EFTs, or wire transfers, were the electronic transmission of account information over private communication networks. Such activity may be thought of as electronic trading, since businesses and individuals could update accounts and trade via EFTs.

Electronic data interchange

Electronic data interchange (EDI), whereby businesses and individuals exchange computer readable data in a standard format to other businesses, was the earliest form of e-commerce. In the late 1960s, electronic data interchange was used to reduce the amount of time and effort inputting data such as invoices, purchase orders and bills. Since this type of information often had a regular format, computer systems were designed to read these documents electronically. Formats had to be agreed, and for many industries, such as transport and shipping, which are global in nature, such a unified approach was important.

Businesses that engage in EDI are referred to as Trading Partners. The biggest users of e-commerce were traditionally government agencies and large corporations. This was due to the high cost of implementation. Until the late 1990s, EDI meant the buying of expensive computer software and hardware, and establishing of direct network connections with all trading partners. Although some companies did offer value-added networks (VANs) as systems to conduct EDI, subscribing to such VANs came at a high cost.

The dot-com boom, bust and rebirth

Between the years 1997 and 2000 over 12,000 internet related businesses were started. However, many of these companies went bust, due to not having sufficiently robust revenue models to generate enough income to sustain their business. As more and more businesses competed for a fixed number of good ideas, internet businesses became overvalued and many bad ideas were also implemented. By 2000, the internet business had started to see a downturn. Thousands of businesses went bust as a lack of advertising revenue meant they could not sustain their early promise.

Learning activity

Write 1,000 words on two or more businesses in your country which started e-commerce activities in the late 1990s and went bust by the year 2002. You should be able to find many news stories during the period 2000-2002 proclaiming the death of e-commerce in your country.

The rebirth of e-commerce

The rebirth of e-commerce has been driven by far wider and more established internet access and businesses learning from the mistakes of the past. In addition, a steady growth in the business-to-consumer and business-to-business sector has meant that sales generated via e-commerce have started to rise.

In trying to understand why the second wave of e-commerce has been so successful, it is important to understand the limitations of the first wave. The following limitations define the first wave:

The first wave of e-commerce was limited to a large degree to US businesses and was not global in nature. Large international organisations felt that the language of the internet would be English, and that consumers would naturally use US businesses who already had a presence on the WWW.

Most of the early e-businesses used English as their language of choice. They created one e-commerce site, in English, and expected consumers from other countries to use this site. This meant that many users who did not speak English, or who did not feel confident enough to buy goods and services in English, did not conduct e-commerce.

Many of the original e-commerce businesses were started with outside investor money backing good ideas. Although investors could see how the internet could be used to refine business processes and reduce transaction costs, less care was taken with understanding how these businesses could produce revenue. Often, businesses were based on the belief that advertising revenue would flood in to support their activities. In reality, the limited budgets of advertising departments and their caution in relation to the use of these budgets online meant that perceived revenue was often not realised.

Email has traditionally been unstructured in terms of how it was used by businesses. Although businesses used email for communications, they had no formal structure and could not be read by machines and therefore were still associated with the high cost of employing people to read them. Email has also been associated with the ever increasing amounts of spam and other unsolicited content.

During the late 1990s, the expected reliance on advertising as a revenue source was a major mistake by many e-businesses. The lack of alternative revenue models or an understanding of what online advertising actually yielded in terms of returns meant that many e-businesses were left with no revenue streams.

Learning activity

Choose two successful online businesses, whose revenue are not based on advertising, and write 1,000 words to describe each of them.

The second wave

The key characteristics of the second wave of e-commerce can be understood to be based on internationalisation and widening participation.

Many businesses have realised that the internet is a global marketplace and have begun to provide global e-commerce presences. Businesses have begun to produce websites in local languages which are customised to local markets in terms of the content they provide.

Online businesses are now more often established with their own funds and capital. Great effort and care is taken in devising revenue models and identifying appropriate revenue streams. There is an emphasis not on who will supply us with revenue, but how are we going to generate revenue. Businesses are willing to be flexible in terms of how revenue is generated, and believe that reacting to current trends is the key to establishing a successful online presence.

There has been an explosion in the number of internet users worldwide, and it is fair to say that most countries in the world now have internet access, if not always at the same level of quality. However, many internet users worldwide now have access to broadband connections, and these have meant that digital content such as video and music can be sold and exchanged online.

There is a much greater emphasis on the use of customised email strategies. Businesses now use email for formulating deep relationships with consumers and ensuring that consumers are contacted in a timely manner.

Businesses today use a multitude of sophisticated advertising approaches that are integrated with their e-business activities. They have developed new strategies for the sale of distributed products with advertising attached.

The main differences between the first and second waves of e-commerce are summarised in the table below.

First Wave	Second Wave
Dominant influence of U.S. businesses. Extensive use of the English language	Global enterprises in many countries are participating in electronic commerce.
Internet technologies were slow. Most consumers connected to the internet using dial-up modems.	The increase in broadband connections in homes is a key element. Although these connections are more expensive, they are up to 20 times faster and can alter the way people use the web.
Electronic mail was used as a tool for relatively unstructured communication.	Customized e-mail strategies are now integral to consumer contact.
Over-reliance on advertising as a revenue source of many failed dot-com businesses.	Some categories of online advertising, such as employment services (job wanted ads) are growing rapidly and are replacing traditional advertising outlets.
Many new companies started with outside investor money	Established companies fund electronic commerce initiatives with their own capital

Business models, revenue models, and business processes

A business model can be thought of as a set of business processes that are combined to yield a profit. In the first wave of e-commerce, it was thought that a good business model would yield significant sales and market dominance. However, the idea that the key to success was simply to copy the business model of a successful dot-com business led to many business failures.

Traditional commerce and business processes

Traditional commerce can broadly be defined as the exchange of valuable objects or services between at least two parties. Such activity includes all of the processes that each party undertakes to complete the transaction. The earliest form of traditional commerce is the barter system.

The activities which most businesses engage in as they conduct commerce are called business processes.

Classic business processes include:

- transferring money and information
- placing of orders for products
- sending of invoices to consumers
- delivery of goods.

It is clear today that some products are more suited to the internet than others. This is because the merchandising skills related to these products transfer more easily to the web. Products that are well suited are: commodity products such as books, CDs, and DVDs. These products are hard to distinguish from the same products or services from other sellers. Their features are standardised and well known by potential buyers.

Other products that are well suited to e-commerce include software which can be downloaded easily via the web, and the sale and purchase of services such as tickets and travel services. The web is an

excellent medium for connecting potential buyers of services to supplier. Consumers can initiate many of the business processes required to complete sales and purchasing activities via a company's website.

The web appears to support the sale and purchase of insurance and investment products, and provides an excellent infrastructure for online banking.

The table below outlines products that are well suited to e-commerce, those that are well suited to traditional commerce, and those that are suited to a combination of traditional and electronic commerce strategies.

Well Suited to Electronic Commerce	Suited to a Combination of Electronic and Traditional Commerce Strategies	Well Suited to Traditional Commerce
Sale/purchase of books and CDs	Sale/purchase of automobiles	Sale/purchase of impulse items for immediate use
Online delivery of software	Online banking	Small-denomination purchases and sales
Sale/purchase of travel services	Roommate-matching services	Sale/purchase of high-value jewellery and antiques
Online shipment tracking	Sale/purchase of residential real estate	
Sale/purchase of investment and insurance products		

A key factor in determining whether a product is well suited to electronic commerce or not will be its shipping profile. A product's shipping profile is the collection of attributes that affect how easily that product can be packaged and delivered. A high value-to-weight ratio can help by making the overall shipping cost a small fraction of the selling price. An airline ticket is an excellent example of an item that has a high value-to-weight ratio. Products that are consistent in size, shape, and weight can make warehousing and shipping much simpler and less costly. However, the shipping profile is only one factor. Expensive jewellery has a high value-to-weight ratio, but many people are reluctant to buy it without first examining it in person. There may be an exception if the jewellery is sold with a generous return policy under a well-known brand name.

Advantages of electronic commerce

All the advantages of electronic commerce for businesses can be summarized in one statement:

> Electronic commerce can increase sales and decrease costs. Advertising done well on the web can get even a small firm's promotional message out to potential consumers in every country in the world. A firm can use electronic commerce to reach narrow market segments that are geographically scattered. The web is particularly useful in creating virtual communities that become ideal target markets for specific types of products or services. A virtual community is a gathering of people who share a common interest, but instead of this gathering occurring in the physical world, it takes place on the internet.

The table below lists some key advantages of e-commerce:

Advantages:	◆ A business can reduce the costs of handling sales inquiries, providing price quotes, and determining product availability by using electronic commerce in its sales support and order-taking processes. ◆ Electronic commerce provides buyers with a wider range of choices than traditional commerce. ◆ Electronic commerce provides buyers with an easy way to customize the level of detail in the information they obtain about a prospective purchase. ◆ Electronic payments of tax refunds, public retirement, and welfare support cost less to issue and arrive securely and quickly when transmitted over the internet. ◆ Electronic payments can be easier to audit and monitor than payments made by cheque, providing protection against fraud and theft losses. ◆ Electronic commerce can also make products and services available in remote areas.

Disadvantages of electronic commerce

Some businesses are less suitable for electronic commerce. Such businesses may be involved in the selling of items which are perishable or high-cost, or which require inspection before purchasing. Most of the disadvantages of electronic commerce today, however, stem from the newness and rapidly developing pace of the underlying technologies. These disadvantages will disappear as electronic commerce matures and becomes more available to and accepted by the general population.

The table below lists some of the key disadvantages of e-commerce:

Disadvantages:	◆ Return-on-investment is difficult to calculate. ◆ Many firms have had trouble recruiting and retaining employees with the technological, design, and business process skills needed to create an effective electronic commerce presence. ◆ Difficulty of integrating existing databases and transaction-processing software designed for traditional commerce into the software that enables electronic commerce. ◆ Many businesses face cultural and legal obstacles to conducting electronic commerce.

Economic forces and electronic commerce

Economists use a formal definition of market that includes two conditions: first, that the potential sellers of a good come into contact with potential buyers, and second, that a medium of exchange is available. This medium of exchange can be currency or barter.

Transaction costs are the total of all costs that a buyer and seller incur as they gather information and negotiate a purchase-sale transaction.

When transaction costs are high, businesses may form organizations to replace market-negotiated transactions. These organizations are generally hierarchical and include strong supervision and worker-monitoring elements. The practice of an existing firm replacing one or more of its supplier markets with its own hierarchical structure for creating the supplied product is called vertical integration. This practice is often facilitated by the use of internet technologies to connect these suppliers with the firm.

Value chains in electronic commerce

A value chain is a way of organizing the activities that each strategic business unit undertakes to design, produce, promote, market, deliver, and support the products or services it sells. In addition to these primary activities, supporting activities, such as human resource management and purchasing, are included when modelling a business's value chain.

Examples of primary activities of a business may include identifying consumers, purchasing materials, manufacturing products, and marketing and selling these products. Additionally, the activities of delivering a product and providing aftersales services are primary activities. Secondary activities include financing and administrating the business, developing human resources, and providing technical support.
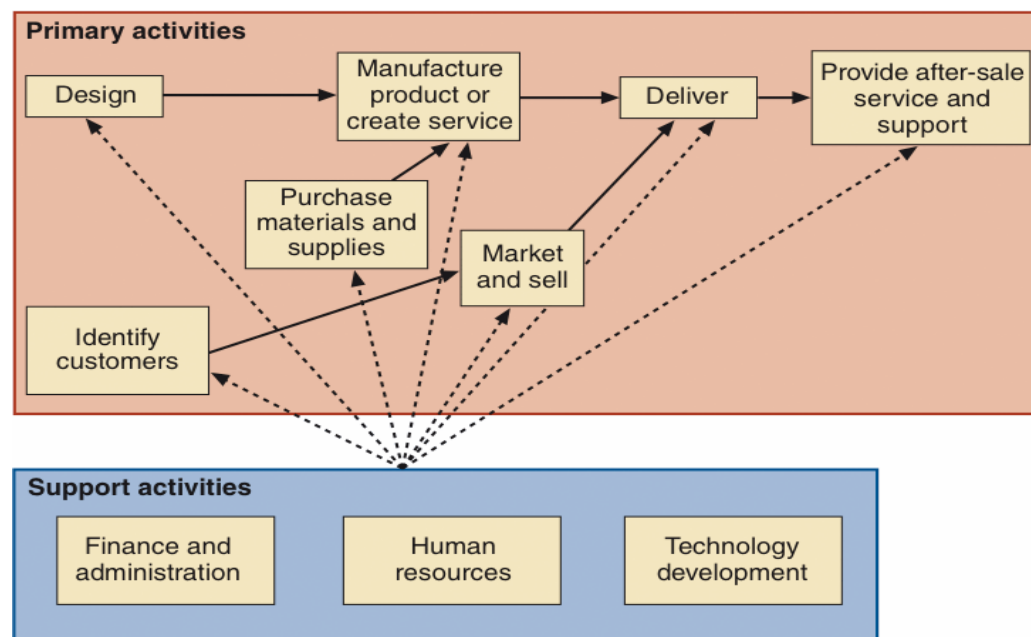
Value chain for a strategic business unit

(Schneider 2007: p.27)

Industry value chains

Michael Porter, an American academic in the field of management and economics, identifies the importance of examining where the strategic business unit fits within its industry. Porter uses the term 'value system' to describe the larger stream of activities into which a particular business unit's value chain is embedded. However, many subsequent researchers and business consultants have used the term 'industry value chain' when referring to value systems.

SWOT analysis: evaluating business unit opportunities

SWOT analysis is an examination of a businesses Strengths, Weaknesses, Opportunities and Threats.

As they examine their industry value chains, many businesses are finding that they can use electronic commerce and internet technologies to reduce costs, improve product quality, reach new consumers or suppliers, and create new ways of selling existing products. For example, a software developer who releases annual updates to programs might consider removing the software retailer from the distribution channel for software updates by offering to send the updates through the internet directly to the consumer. This change would modify the software developer's industry value chain and would provide

an opportunity for increasing sales revenue (the software developer could retain the margin a retailer would have added to the price of the update), but it would not appear as part of the software developer business unit value chain. By examining elements of the value chain outside the individual business unit, managers can identify many business opportunities, including those that can be exploited using electronic commerce.

Strengths	Weaknesses
• What does the company do well? • Is the company strong in its market? • Does the company have a strong sense of purpose and the culture to support that purpose?	• What does the company do poorly? • What problems could be avoided? • Does the company have serious financial liabilities?
Opportunities	**Threats**
• Are industry trends moving upward? • Do new markets exist for the company's products/services? • Are there new technologies that the company can exploit?	• What are competitors doing well? • What obstacles does the company face? • Are there troubling changes in the company's business environment (technologies, laws, and regulations)?

SWOT analysis questions

(Schneider 2007: p.30)

International nature of electronic commerce

It is important for all businesses to establish trusting relationships with their consumers. Companies with established reputations in the physical world often create trust by ensuring that consumers know who they are. These businesses can rely on their established brand names to create trust on the web. New companies that want to establish online businesses face a more difficult challenge because a kind of anonymity exists for companies trying to establish a web presence.

Most companies now realize that the only way to do business effectively in other cultures is to adapt to those cultures. The phrase "think globally, act locally" is often used to describe this approach. The first step that a web business usually takes to reach potential consumers in other countries, and thus in other cultures, is to provide local language versions of its website. This may mean translating the website into another language or regional dialect. Researchers have found that consumers are far more likely to buy products and services from websites in their own language, even if they can read English well. Only 370 million of the world's 6 billion people learned English as their native language.

An important element of business trust is anticipating how the other party to a transaction will act in specific circumstances. That is one reason why companies with established brands can build online businesses more quickly and easily than a new company without a reputation. The brand conveys some expectations about how the company will behave. For example, a potential buyer might like to know how the seller would react to a claim by the buyer that the seller misrepresented the quality of the goods sold. Part of this knowledge derives from the buyer and seller sharing a common language and common customs. Business partners ideally have a common legal structure for resolving disputes. The combination of language and customs is often called culture. Most researchers agree that culture varies across national boundaries and, in many cases, varies across regions within nations. All companies must be aware of the differences in language and customs that make up the culture of any region in which they intend to do business.

Businesses that successfully meet the challenges posed by trust, language, and culture issues still face the challenges posed by variations and inadequacies in the infrastructure that supports the internet throughout the world. Internet infrastructure includes the computers and software connected to the internet and the communications networks over which the message packets travel. In many countries other than the United States, the telecommunications industry is either government owned or heavily regulated by the government. In many cases, regulations in these countries have inhibited the development of the telecommunications infrastructure or limited the expansion of that infrastructure to a size that cannot reliably support internet data packet traffic.

More than half of all businesses on the web turn away international orders because they do not have the processes in place to handle such orders. Some of these companies are losing millions of dollars worth of international business each year. This problem is global; not only are U.S. businesses having difficulty reaching their international markets, but businesses in other countries are having similar difficulties reaching the U.S. market.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

_____ 1. IBM defines electronic business as "the transformation of key business processes through the use of internet technologies."

_____ 2. Business-to-consumer electronic commerce occurs when a person sells an item through a web auction site to another person.

_____ 3. In some cases, business processes use traditional commerce activities very effectively, and technology cannot improve upon them.

_____ 4. A product that has a strong brand identity is easier to sell over the web than an unbranded item.

_____ 5. Electronic commerce provides buyers with an easy way to customize the level of detail in the information they obtain about a prospective purchase.

_____ 6. Electronic payments can be easier to audit and monitor than payments made by cheque.

_____ 7. Economists use a formal definition of a market that includes two conditions: first, that the potential sellers of a good come into contact with potential buyers; and second, that a medium of exchange is available.

_____ 8. Nobel laureate Ronald Coase reasoned that when transaction costs were low, businesspeople would form organizations to replace market-negotiated transactions.

_____ 9. Sellers and buyers in commodity markets experience significant transaction costs.

_____ 10. A small-denomination item is a product or service that is hard to distinguish from the same product or services provided by other sellers.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____11. The group of logical, related, and sequential activities and transactions in which businesses engage are often collectively referred to as business ____.
  a. services
  b. processes
  c. logistics
  d. communications

____12. Some researchers define a fourth category of electronic commerce called ____, which includes individuals who buy and sell items among themselves.
  a. C2C
  b. B2B
  c. C2B
  d. B2C

____ 13. Electronic funds transfers are also called ____.
  a. wire transfers
  b. business transfers
  c. money transfers
  d. telephone transfers

____14. A(n) ____ is a set of processes that combine to yield a profit.
  a. value system
  b. industry value chain
  c. shipping profile
  d. business model

____15. ____ transactions are not well suited to electronic commerce because no standard method for transferring small amounts of money on the web has become generally accepted.
  a. E-procurement
  b. Commodity items
  c. Local
  d. Low-denomination

____16. Which of the following will never lend themselves to electronic commerce?
  a. Greeting cards
  b. High value diamonds
  c. Books
  d. Cigars

____17. ____ organizations are particularly well suited to technology industries that are information-intensive.
  a. Network
  b. Retailing
  c. Hierarchical
  d. Manufacturing

____18. As more people participate in a network, the value of the network to each participant increases. This is known as the ____.
  a. law of diminishing returns
  b. network effect
  c. listing effect
  d. fax effect

____19. Manuel Castells has predicted that ____ will become the organizing structure for all social interactions among people.
  a. economic networks
  b. free enterprises
  c. hierarchical layers
  d. value systems

____20. In the mid-1990s, ____ used a SWOT analysis to create a strong business strategy that has helped it become a strong competitor in its industry value chain.
  a. HP Computer
  b. Acer Computer
  c. Dell Computer
  d. NEC Computer

Essay questions

21. What types of business processes are well suited to electronic commerce?

22. Discuss the importance of transaction costs.

23. List the primary and support activities that are implemented in strategic business unit value chains.

24. When conducting SWOT analysis, what are some of the questions that one should ask to identify strengths and weaknesses?

25. Describe the three categories of electronic commerce that are most commonly used.

Chapter 2

2 Technology infrastructure: the internet and the world wide web

Introduction

The relentless advance of the internet, and its surrounding technologies, has driven a significant shift in how organisations communicate in the last thirty years. The internet's advancing technological infrastructure, in particular the emergence of network-based computing, facilitates the fast-growing realm of the economic sphere – e-commerce.

The internet – essentially, a global network of computers - is now a primary medium for marketing, advertising, publishing, software distribution, real-time communications, radio, film, television and digital video broadcasting.

The world wide web (WWW) emerged in the 1990s, and its architect, considered to be Tim Berners-Lee, also invented HTML, its accompanying Hypertext Mark-up Language, which was added to the growing global network for navigation. Current technology also support multimedia playback of sound, graphics and moving images.

Companies conducting business on the web must adapt and accept the inevitable evolution and development of its technology. These developments effect hardware and software, and can also change consumer behaviour, in particular the way consumers interact with the company. This in turn will influence company revenue and profile.

This chapter will give you a broad understanding of the internet technologies upon which electronic commerce, in all its forms, is based today. It will be an important foundation, since many of the concepts and ideas which will be discussed in greater detail later in the course are introduced in this chapter.

Student reading

It is strongly advised that you now read Chapter 2 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Discuss the origin, growth, and current structure of the internet.
- Explain how packet-switched networks are combined to form the internet.
- Discuss in detail how internet protocols and internet addressing work.
- Critically discuss the history and use of markup languages on the web, including SGML, HTML, and XML.
- Explain how HTML tags and links work on the world wide web.
- Assess the differences among internets, intranets, and extranets.

- Discuss the different options for connecting to the internet, including cost and bandwidth factors.
- Discuss Internet2 and the Semantic Web.

Subject summary

Chapter overview

This chapter is about the history of the internet and the world wide web, and how these technologies emerged from research projects and grew to be the supporting infrastructure for electronic commerce today. It also describes the protocols, programs, languages, and architectures that support the internet and the web.

In order for electronic commerce to exist, a number of technologies must first be in place. Both the internet and the WWW require support from database software, network switches and hubs, encryption hardware and software, multimedia structures and a way to integrate each of these technologies. This chapter analyses each of the technologies that electronic commerce relies upon for technological support.

The internet and the world wide web

A computer network is any technology that allows people to connect computers to each other. The internet is a global computer network, to which new computers are connected on a daily basis. This computer network - the internet - is the basic technology structure underlying all electronic commerce.

Of the millions of people who use the internet every day, only a small percentage of them really understand how it works. The internet is a large system of interconnected computer networks that span the globe. The part of the internet known as the world wide web, or, more simply, the web, is a subset of the computers on the internet that are connected to each other in a specific way, that makes them and their contents easily accessible to each other. The web is operated by an easy-to-use standard interface. This is its most important asset, as it is this which renders it accessible to the majority of users who are not computer experts.

Timeline:	♦ **Origins of the internet:** 1969: researchers in the Advanced Research Projects Agency (ARPA) Defence Department used the network model developed by its researchers to connect four computers—one each at the University of California at Los Angeles, SRI International, the University of California at Santa Barbara, and the University of Utah—into a network called the ARPANET. The ARPANET was the earliest of the networks that eventually combined to become what we now call the internet. ♦ **New Uses for the internet:** 1972: E-mail was born when Ray Tomlinson, a researcher who used the network, wrote a program that could send and receive messages over the network. This new method of communicating became widely used very quickly. In addition, the first e-mail mailing lists - an e-mail address that forwards any message it receives to any user who has subscribed to it - also appeared on these networks. In 1979, a group of students and programmers at Duke University and the University of North Carolina started User's News Network – Usenet, which allows anyone who connects to the network to read and post articles on a variety of subjects. ♦ **Commercial Use of the internet:** 1989: the National Science Foundation (NSF) permitted two commercial e-mail services, MCI Mail and CompuServe, to establish limited connections to the internet for the sole purpose of exchanging e-mail transmissions with users of the internet. These connections allowed members of the research and education communities on the internet to send e-mail directly to MCI

	Mail and CompuServe addresses, and – most important historically – allowed commercial enterprises to send e-mail directly to internet addresses.
	◆ **Growth of the internet:** 1995: The privatization of the internet was substantially completed when the NSF turned over the operation of the main internet connections to a group of privately owned companies. The new structure of the internet was based on four network access points (NAPs) located in San Francisco, New York, Chicago, and Washington, D.C., each operated by a separate telecommunications company. As the internet grew, more companies opened more NAPs in more locations. These companies, known as network access providers, sell internet access rights directly to larger consumers and indirectly to smaller firms and individuals through other companies, called internet service providers (ISPs).

Emergence of the world wide web

The WWW is software that runs on computers that are connected to the internet. The network traffic generated by web software is currently the largest single category of traffic on the internet, outpacing e-mail, file transfers, and other data transmission traffic.

The Development of Hypertext:	◆ **1945:** Vannevar Bush, who was director of the U.S. Office of Scientific Research and Development, wrote an article in *The Atlantic Monthly* speculating that engineers would eventually build a machine that he called the Memex, a memory extension device that would store all of an individual's books, records, letters, and research results on microfilm.
	◆ **1960s:** Ted Nelson described a similar system in which text on one page links to text on other pages – which he called hypertext. Douglas Engelbart created the first experimental hypertext system on one of the large computers of the 1960s – and also invented the computer mouse.
	◆ **1987:** Ted Nelson published Literary Machines, a book in which he outlined, a global system for online hypertext publishing and commerce, called project Xanadu.
	◆ **1989:** Tim Berners-Lee proposed a hypertext development project with the intention of providing data-sharing functionality. Over the next two years, Berners-Lee developed the code for a hypertext server program and made it available on the internet.

Packet-switching networks

A local area network (LAN) is network of computers located close together (for example, in the same building). Networks of computers that are connected over greater distances are called wide area networks (WANs).

An individual packet of information travels from one network to another through routing computers – the computers through which the packet travels determine the best route for getting the packet to its destination. Routing computers, router computers, routers, or gateway computers act as the gateway from a LAN or WAN to the internet. They decide how best to forward each packet, as they are located at the border between the organization and the internet. The programs on router computers that determine the best path on which to send each packet contain rules called *routing algorithms*. The programs apply their routing algorithms to information they have stored in routing tables or configuration tables.

The internet also has routers which handles packet traffic along the internet's main connecting points. These routers and the telecommunications lines connecting them are collectively referred to as the internet backbone. These routers are very large computers that can each handle more than 50 million packets per second! They are often known as *backbone routers*.
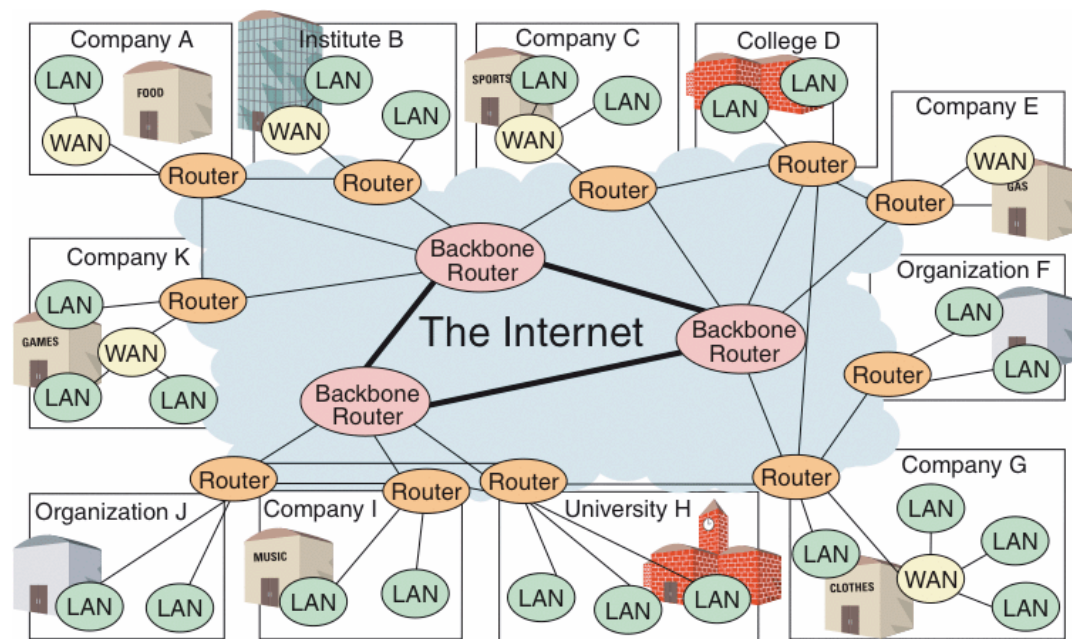
Router-based architecture of the internet

(Schneider 2007: p. 61)

Transmission control protocol/internetworking protocol (TCP/IP)

The collection of rules for formatting, ordering, and error-checking data sent across a network is called a protocol. This open architecture philosophy was developed for the evolving ARPANET (which later became the core of the internet) and included the use of a common protocol for all computers connected to the internet.

The set of communication protocols and applications used to communicate between computers on the internet is called TCP/IP. This set of protocols define the rules by which packets are created, connections are made and information is transported between computers on the internet. This set of protocols was first developed by Vincent Cerf and Robert Kahn in the early 1970s.

TCP is the protocol that defines how each message is de-assembled into packets before transmission and also specifies how such packets are re-assembled into a message or file once they arrive. IP specifies the rules that govern how packets are routed from their source computer across the internet to a destination computer.

IP addresses and domain names

The version of IP that has been in use for the past 20 years on the internet is *Internet Protocol version 4*, abbreviated IPv4. It uses a 32-bit number to identify the computers connected to the internet. This address is called an IP address. Computers do all of their internal calculations using a base 2 (binary) number system in which each digit is either a 0 or a 1, corresponding to a condition of either off or on.

When a router breaks a message into packets before sending it onto the internet, the router marks each packet with both the source IP address and the destination IP address of the message. To make them easier to read, IP numbers (addresses) appear as four numbers separated by periods. This notation system is called dotted decimal notation. An IPv4 address is a 32-bit number, so each of the four numbers is an 8-bit In most computer applications, an 8-bit number is called a byte; however, in networking applications, an 8-bit number is often called an octet. In binary, an octet can have values

from 00000000 to 11111111; the decimal equivalents of these binary numbers are 0 and 255, respectively.

The Internet Engineering Task Force (IETF) worked on several new protocols that could solve the limited addressing capacity of IPv4 (there are only 2^{32} different addresses available), and in 1997, approved Internet Protocol version 6 (IPv6) as the protocol that will replace IPv4. The new IP is being implemented gradually because the two protocols are not directly compatible.

Due to concern that users might find the dotted decimal notation difficult to remember, the founders of the internet created an alternative addressing method that uses words. In this system, an address such as www.thomson.com is called a *domain name*. Domain names are sets of words that are assigned to specific IP addresses and can contain two or more word groups separated by periods. The rightmost part of a domain name is the most general, as you move to the left, each part of the domain name becomes more specific.

Webpage request and delivery protocols

Web client computers run software called web client or web browser software, which sends requests for webpage files to other computers, called *web servers*. A web server computer runs software called web server software. Web server software receives requests from many different web clients and responds by sending files back to those web client computers. Now the web client computer's web client software renders those files into a *webpage*. Thus, the purpose of a web server is to respond to requests for web pages from web clients. Thus client / server architecture is when client computers running web client software combine with server computers running web server software.

Other internet protocols

Electronic mail (e-mail) sent across the internet must also be formatted according to a common set of rules. Most organizations use a client/server structure to handle e-mail. The organization has a computer called an e-mail server and its software is devoted to storing, forwarding and general handling of e-mail. People in the organization might use a variety of e-mail client software programs, to read and send e-mail. These programs include Microsoft Outlook, Netscape Messenger, Pegasus Mail, Qualcomm Eudora, and many others. The e-mail client software communicates with the e-mail server software on the e-mail server computer to send and receive e-mail messages. The various types of email protocols include:

- Simple Mail Transfer Protocol (SMTP) which specifies the format of e-mail messages

- Post Office Protocol (POP) which is responsible for the retrieval of e-mail and attachments from mail server computers (special computers responsible for storing electronic mail connected to the internet).

- Interactive Mail Access Protocol (IMAP) which defines how an e-mail client program requests mail from a mail server and determines which messages are selected for download. IMAP also allows users to create and manipulate mail boxes on mail servers.

Unsolicited commercial e-mail (UCE)

Unsolicited commercial e-mail (UCE), also known as *spam* or bulk mail, is electronic junk mail and can include solicitations, advertisements, or e-mail chain letters. Spam has become a major concern within internet technology. To an individual and a company, the negative effects of spam include time wasting and inefficient use of computer disk space, as well as consuming large amounts of internet capacity. If one person sends a useless e-mail to a million other people, that unsolicited mail consumes internet resources for a few moments that would otherwise be available to other users.

Markup languages and the web

Web pages can include many elements, such as graphics, photographs, sound clips, and even small programs that run in the web browser. These elements are stored on the web server as separate files. The most important parts of a webpage, however, are the structure of the page and the text that makes up the main part of the page. The page structure and text are stored in a text file that is formatted, or marked up, using a *text markup language*. A text markup language specifies a set of tags that are inserted into the text. These markup tags, also called tags, provide formatting instructions that web client software can understand. The web client software utilises the instructions as it renders the text and page elements contained in the other files into the webpage that appears on the screen of the client computer.

♦ **Standard Generalized Markup Language (SGML):** Used for many years by the publishing industry to create documents that needed to be printed in various formats and that were revised frequently. In addition, SGML is also a *meta language* - a language that can be used to define other languages. SGML offers user-defined tags, is non-proprietary and platform independent.

♦ **Hypertext Markup Language:** HTML includes tags in an electronic document that define the format and style of text elements. The tags in an HTML document are interpreted and used by the web browser to format the display of the text enclosed by the tags. The web organizes interlinked pages of information residing on sites around the world. Hyperlinks on web pages form a "web" of those pages. Versions of HTML released by the W3C after 1997 include an HTML tag called the object tag and also include support for Cascading Style Sheets. Web designers can embed scripting language code on HTML pages by using the object tag.

♦ **Extensible Markup Language (XML)**: XML is referred to as a meta language since users can create their own markup elements, thus extending its usefulness. Note that XML includes data management capabilities that HTML cannot provide. XML differs from HTML in two important respects. First, XML is not a markup language with defined tags. It is a framework within which individuals, companies, and other organizations can create their own sets of tags. Second, XML tags convey the meaning (the semantics) of the information included within them without specifying how text appears on a webpage.

♦ **HTML and XML Editors**: Web designers can create HTML documents in any general-purpose word processor or text editor. However, by using one of the special-purpose HTML editors, web designers may be able to create web pages much more easily. There are many freeware, shareware, and commercial HTML editors available for download on the internet, for example CoffeeCup, HomeSite, and CuteHTML. XML files, like HTML files, can be created in any text editor. However, programs designed to make the task of designing and managing XML files easier are also available, such as Epic Editor, TurboXML, XMetal, and XML Spy.
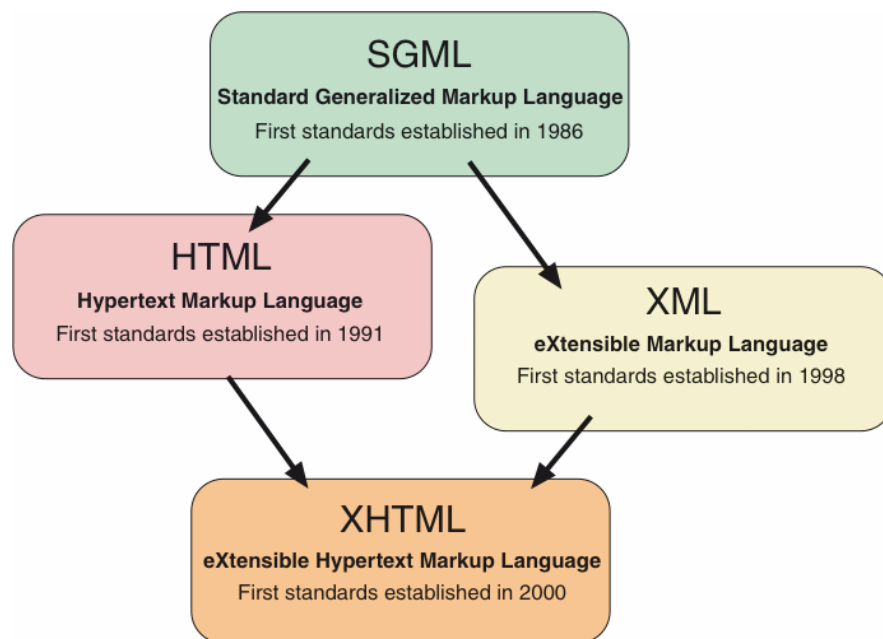
Development of markup languages

(Schneider 2007: p.69)

Not all TCP/IP networks need to connect to the internet. Many companies build *intranets* which are an interconnected network (or internet), usually using the TCP/IP protocol set, that do not extend beyond their organizational boundaries. An *extranet* is an intranet that has been extended to include specific entities outside the boundaries of the organization, such as business partners, consumers, or suppliers. The infrastructure for a private network should include a TCP/IP network, WWW authoring software, WWW server hardware and software, WWW clients and a firewall server. Benefits of a private network include minimising cost (since many of these requirements are probably in place at a firm already using electronic commerce), increasing time efficiency, and making relevant internal information more easily accessible.

Internet connection options

As we have learned, the internet is a set of interconnected networks. A corporation or individual cannot become part of the internet without a telephone connection or a connection to a LAN or intranet. Larger firms that provide internet access to other businesses are *called Internet Access Providers* (IAPs) or *Internet Service Providers* (ISPs), and they usually offer several connection options. Following is a brief description, including the advantages and disadvantages, of current connection choices.

Connectivity overview

ISPs enable several different ways to connect to the internet. The most common connection options are voice-grade telephone line, various types of broadband connections, leased line, and wireless. *Bandwidth* is one of the major distinguishing factors between various ISPs and their connection options. Bandwidth is the amount of data that can travel through a communication line per unit of time. The higher the bandwidth, the faster data files travel and the faster web pages appear on your screen.

Voice-grade telephone connections

The most common way to connect to an ISP is through a modem connected to your local telephone service provider. POTS, (Plain Old Telephone Service) use existing telephone lines and an analogue modem to provide a bandwidth of between 28 and 56 Kbps. Some telephone companies offer a higher grade of service called Digital Subscriber Line (DSL) protocol.

Broadband connections

Broadband services are connections that operate at speeds of greater than about 200 Kbps. One of the newest technologies that uses the DSL protocol to provide service in the broadband range is Asymmetric Digital Subscriber Line (ADSL, usually abbreviated DSL). It provides transmission bandwidths from 100 to 640 Kbps upstream and from 1.5 to 9 Mbps (million bits per second) downstream. For businesses, a high-speed DSL (HDSL) connection service can provide more than 768 Kbps of *symmetric* bandwidth.

Leased-line connections

Very high bandwidth is available to large organizations that need to connect hundreds or thousands of individual users to the internet. NAPs use T1 and T3 lines. NAPs and the computers that perform routing functions on the internet backbone also use technologies such as frame relay and Asynchronous Transfer Mode (ATM) connections and optical fibre (as opposed to copper wire) connections with bandwidths determined by the class of fibre optic cable used. An OC3 (optical carrier 3) connection provides 156 Mbps, an OC12 provides 622 Mbps, an OC48 provides 2.5 gbps (gigabits, or 1 billion bits per second), and an OC192 provides 10 gbps.

Wireless Connections

In recent years, companies such as DirecPC, DIRECWAY, and StarBand, have started to offer satellite internet connections that do not require a POTS modem connection for uploads. These connections use a microwave transmitter for internet uploads. This transmitter provides upload speeds as high as 150 Kbps. Initially, the installation charges were much higher than for other residential internet connection services because a professional installer was needed to carefully aim the transmitter's dish antenna at the satellite. As the accuracy of the antennas improved, some of these companies now offer a self-installation option that drastically reduces the initial cost. However, many are still affected by its limitations. For example, in North America the antennas must have a clear line of sight into the south-western sky. This requirement can make these services unusable for many people living in large cities or on the wrong side of an apartment building.

Learning activity

Do some research to find out about the different kinds of internet connection services which are available in your own area. What are the benefits of these different services and what are the costs?

Internet2

Internet2 is an experimental test bed for new networking technologies that is separate from the original internet. At the high end of the bandwidth spectrum, a group of network research scientists from nearly 200 universities and a number of major corporations joined together in 1996 to recapture the original enthusiasm of the ARPANET with an advanced research network. When the National Science Foundation turned over the internet backbone to commercial interests in 1995, many scientists felt that they had lost a large, living laboratory. Internet2 is the replacement for that laboratory. It has achieved bandwidths of 10 gbps and more on parts of its network.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____1. E-mail was born in 1972 when a researcher wrote a program that could send and receive messages over the network.

____2. In 1989, the NSF permitted two commercial e-mail services, MCI Mail and CompuServe, to establish limited connections to the internet for the sole purpose of exchanging e-mail transmissions with users of the internet.

____3. The web is software that runs on computers that are connected to the internet.

____4. A domain name is a set of words assigned to specific IP addresses.

____5. IMAP is a newer e-mail protocol that performs the same basic functions as POP, but includes additional features.

____6. HTML is a meta language because users can create their own markup elements that extend the usefulness of XML.

____7. XML is a markup language with defined tags.

____8. The internet provides a high degree of security in its basic structure.

____9. Asymmetric connections provide the same bandwidth for each direction.

____10. The Internet2 project is focused mainly on technology development.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____11.   HTML was developed by ____.
            a.   ARPANET   c.   Ted Nelson
            b.   NSF   d.   Tim Berners-Lee

____12.   When packets leave a network to travel on the internet, they must be translated into a standard format. ____ usually perform this translation function.
            a.   Switches   c.   Routers
            b.   Bridges   d.   Routing algorithms

____13.   ____ travel from computer to computer along the interconnected networks until they reach their destinations.
            a.   Routers   c.   Switches
            b.   Packets   d.   Bridges

_____ 14.	Routers and the telecommunications lines connecting them are collectively referred to as _____.
  a.	backbone routers	c.	an asynchronous backbone
  b.	internet routers	d.	the internet backbone

_____ 15.	IPv6 uses a(n) _____ number for addresses.
  a.	32-bit	c.	128-bit
  b.	56-bit	d.	256-bit

_____ 16.	The _____ numbering system uses 16 digits.
  a.	hexadecimal	c.	binary
  b.	decimal	d.	ASCII

_____ 17.	The rightmost part of a domain name is called a(n) _____.
  a.	top-level domain	c.	category
  b.	URL	d.	government-level domain

_____ 18.	The early versions of _____ allowed webpage designers to create text-based electronic documents with headings, title bar titles, bullets, lines, and ordered lists.
  a.	HTTP	c.	SGML
  b.	HTML	d.	XML

_____ 19.	The _____ tag is used to create hyperlinks in a web document.
  a.	head	c.	title
  b.	anchor	d.	ol

_____ 20.	A(n) _____ is an interconnected network, usually one that uses the TCP/IP protocol set, and does not extend beyond the organization that created it.
  a.	internet	c.	intranet
  b.	extranet	d.	ARPANET

Essay questions

21.	As an individual packet travels from one network to another, the computers through which the packet travels determine the best route for getting the packet to its destination. Describe this process.

22.	Identify the four key rules for message handling.

23.	What is the difference between TCP and IP?

24.	What is the difference between a public network and a private network?

25.	What are the advantages of Bluetooth technology?

Chapter 3

3 Selling on the web: revenue models and building a web presence

Introduction

This chapter is about the about the various models used by web businesses today to generate revenue. Such models include: web catalogue, advertising-supported, advertising-subscription mixed, and fee-based. These approaches can work for both business-to-consumer (B2C) and business-to-business (B2B) electronic commerce. Many companies create one website to handle both B2C and B2B sales. Some businesses use the same revenue model for both types of sales, despite creating separate sites (or separate pages within one site) for B2C and B2B e-commerce.

In this chapter you will learn how to create an effective web presence for an electronic commerce application. The chapter covers the ways in which online consumers can be identified and reached, the creation and maintenance of brands on the WWW and the business models used for selling products on the WWW.

Student reading

It is strongly advised that you now read Chapter 3 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Discuss relative approaches for constructing revenue models.
- Critically analyse how some companies move from one revenue model to another to achieve success.
- Discuss the revenue strategy issues that companies face when selling on the web.
- Compare and contrast alternative approaches to creating an effective business presence on the web.
- Explain the main issues associated with website usability.
- Discuss alternative approaches to effective communication with consumers on the web.

Subject summary

Chapter overview

This chapter gives an overview regarding how a business may establish an effective WWW presence. It addresses the issue of how to assess user needs and meet user expectations regarding functionality and usability of the website. New marketing approaches for the WWW are outlined, and the nature of communication on the WWW is explored.

Establishing an effective WWW presence is vital for any company wishing to conduct electronic commerce. A WWW presence represents a company's public image on the internet. It is important that such a presence conveys the right image to all the major stakeholders. These include consumers, suppliers, stockholders, and the general public. The growth of the internet has increased the importance of establishing a company's WWW presence – it may be the only point of contact which a consumer has with a company. Furthermore, if a company does not have a physical location, for example high street retail outlets, then its presence on the internet also represents its presence in the real world.

Revenue models

A useful way to think about electronic commerce implementations is to consider how they can generate revenue. However, it is important to remember that not all electronic commerce initiatives have the goal of providing revenue; some are undertaken to reduce costs or improve customer service.

Web catalogue revenue models

In this revenue model, the seller establishes a brand image, and then uses the strength of that image to sell through printed catalogues mailed to prospective buyers. Buyers place orders by mail or by calling a telephone number provided. This revenue model, which is often called the mail order or catalogue model, has proven to be successful for a wide variety of consumer items, including clothing, computers, electronics, household goods, and gifts.

When a company of this type wishes to enter the e-commerce market, they transfer or supplement their catalogue with an online version. When the catalogue model is expanded in this way, it is often called the *web catalogue revenue model*.

Digital content revenue models

The web is a new and highly efficient distribution mechanism for firms that own written information (words or numbers) or rights to that information. For example, LexisNexis began as a legal research tool, and it has been available as an online product for years. Today, LexisNexis offers a variety of information services, including legal information, corporate information, government information, news, and resources for academic libraries.

One of the first academic organizations to make the transition to electronic distribution on the web was (not surprisingly) the Association for Computer Machinery (ACM). The ACM Digital Library offers subscriptions to electronic versions of its journals to its members and to library and institutional subscribers. Academic publishing has always been a difficult business in which to make a profit because the base of potential subscribers is so small. Even the most highly regarded academic journals often have fewer than 2000 subscribers. To break even, academic journals must often charge each subscriber hundreds or even thousands of dollars per year. Electronic publishing eliminates the high costs of paper, printing, and delivery, and makes dissemination of research results more efficient and less expensive.

Advertising-supported revenue models

Most television channel output is enabled by an advertising-supported revenue model. Broadcasters provide free programming to an audience along with advertising messages. The advertising revenue is sufficient to support the operations of the network and the creation or purchase of the programs. Many observers of the web in its early growth period believed that the potential for internet advertising was tremendous. Web advertising grew from essentially zero in 1994 to $2 billion in 1998. However, web advertising was flat or declining in the years 2000 through 2002. Since then, web advertising has once again started to grow, but at much slower rates than in the early years of the web.

The overall success of online advertising has been hampered by two major problems. First, no consensus has emerged on how to measure and charge for site visitor views. It has been difficult for web advertisers to develop a standard for advertising charges because interaction with the web can be measured in a multiple of complex ways. Interaction with a website may be measured in terms of number of visitors, number of unique visitors, number of click-throughs, and other attributes of visitor behaviour.

In addition to the number of visitors or page views, *stickiness* is a critical element in creating a presence that attracts advertisers. If a website is sticky, people will spend more time on it, visit it often and bookmark it (add it to their list of favourite websites).

Learning activity

What do you think makes a website *sticky*? Consider the websites that you have bookmarked or listed as favourites. Why do you favour these websites compared with others that may contain similar material?

As most successful advertising on the web is targeted at very specific groups, the second problem is that very few websites have a sufficient number of visitors to interest large advertisers. The set of characteristics that marketers use to group visitors is called demographic information. This includes personal information such as address, age, gender, income level, type of job held, hobbies and religion.

Advertising-subscription mixed revenue models

In an advertising-subscription mixed revenue model, which has been used for many years by traditional print newspapers and magazines, subscribers pay a fee and accept some level of advertising. On websites that use the advertising-subscription revenue model, subscribers are typically subjected to much less advertising than they are on advertising-supported sites. Firms have had varying levels of success in applying this model and a number of companies have moved to or from this model over their lifetimes.

Two of the world's most distinguished newspapers, *The New York Times* and *The Wall Street Journal*, use a mixed advertising-subscription model. *The New York Times* version is mostly advertising supported, but the newspaper has experimented in recent years with charging fees for access to various parts of its site. In 2005, *The New York Times* began charging a fee for access to its Op Ed and news columns. The newspaper also charges for access to its premium crossword puzzle pages. *The New York Times* also provides a searchable archive of articles dating back to 1996 and charges a small fee for viewing any article older than one week. *The Wall Street Journal's* mixed model is weighted more heavily to subscription revenue. The site allows non-subscriber visitors to view the classified ads and certain stories from the newspaper, but most of the content is reserved for subscribers who pay an annual fee for access to the site. Visitors who already subscribe to the print edition are offered a reduced rate on subscriptions to the online edition.

Fee-for-transaction revenue models

In the fee-for-transaction revenue model, businesses offer services and charge a fee based on the number or size of transactions they process. Some of these services lend themselves well to operating on the web - companies can offer much of the personal service formerly provided by human agents, as the website can offer visitors similar information they would have previously heard from one of the company's phone operatives. If consumers are willing to enter transaction information into website forms, these sites can provide options and execute transactions much less expensively than traditional transaction service providers. The removal of an intermediary, such as a human agent, from a value chain is called *disintermediation*. The introduction of a new intermediary, such as a fee-for-transaction website, into a value chain is called *reintermediation*.

Fee-for-service revenue models

Companies are offering an increasing variety of services on the web for which they charge a fee. These are neither broker services nor services for which the charge is based on the number or size of transactions processed. The fee is based on the value of the service provided. These fee-for-service revenue models range from games and entertainment to financial advice and the professional services of accountants, lawyers, and physicians.

Revenue models in transition

Success on the web depends upon being willing and able to change and develop business structures as both technology and attitudes develop. Many companies have gone through transitions in their revenue models as they learn how to do business successfully on the web. As more people use the web to buy goods and services, and as the behaviour of those web users changes, companies often find that they must change their revenue models to meet the needs of those new and changing web users. Here are some examples:

Subscription to advertising-supported model

Microsoft founded its *Slate* magazine website as an upscale news and current events publication. Although *Slate* drew a wide readership and received acclaim for its incisive reporting and excellent writing, it was unable to draw a sufficient number of paid subscribers. At its peak, *Slate* had about 27,000 subscribers generating annual revenue of $500,000, which was far less than the cost of creating the content and maintaining the website. *Slate* is now operated as an advertising-supported site.

Advertising-supported to advertising-subscription mixed model

After operating for several years as an advertising-supported site, *Salon.com* now offers an optional subscription version of its site. The subscription offering was motivated by the company's inability to raise the additional money from investors that it needed to continue operations.

Advertising-supported to fee-for-services model

Xdrive Technologies opened its original advertising-supported website in 1999. Xdrive offered free disk storage space online to users. The users saw advertising on each page and had to provide personal information that allowed Xdrive to send targeted e-mail advertising to them. Its offering was very attractive to web users who had begun to accumulate large files, such as MP3 music files, and wanted to access those files from several computers in different locations.

After two years of offering free disk storage space, Xdrive found that it was unable to pay the costs of providing the service with the advertising revenue it had been able to generate. It switched to a subscription-supported model and began selling the service to business users as well as individuals.

Advertising-supported to subscription model

Northern Light was founded in August 1997 as a search engine with a twist. In addition to searching the web, it searched its own database of journal articles and other publications to which it had acquired

reproduction rights. Northern Light's revenue model was a combination of the advertising-supported model used by most other web search engines plus a fee-based information access service.

In January 2002, Northern Light decided that the advertising revenue it was earning from the ads it sold on search results pages was insufficient to justify continuing to offer that service. It stopped offering public access to its search engine and converted to a new revenue model that was primarily subscription supported. Northern Light's main revenue source in its new model is from annual subscriptions sold to large corporate clients.

Multiple transitions

Encyclopædia Britannica began its online expansion with two web-based offerings. The *Britannica Internet Guide* was a free web navigation aid that classified and rated information-laden websites. It featured reviews written by Britannica editors who also selected and indexed the sites. The company's other website, *Encyclopædia Britannica Online*, was available for a subscription fee or as part of the Encyclopædia Britannica CD package. Britannica used the free site to attract users to the paid subscription site.

By 1999, disappointed by low subscription sales, Britannica converted to a free, advertiser-supported site at no cost to the public. However, on the first day, the new site, *Britannica.com*, had over 15 million visitors, forcing Britannica to shut down for two weeks to upgrade its servers.

The Britannica.com site then offered the full content of the print edition in searchable form, plus access to the *Merriam-Webster's Collegiate Dictionary* and the *Britannica Book of the Year*. After two years of trying to generate a profit using this advertising-supported model, Britannica faced declining advertising revenues. In 2001, Britannica returned to a mixed model in which it offered free summaries of encyclopaedia articles and free access to the *Merriam-Webster's Collegiate Dictionary* on the web, with the full text of the encyclopaedia available for a subscription fee of $50 per year or $5 per month.

Learning activity

Suppose you have been employed by the owner of www.Dictionary.com to explore revenue generating alternatives. Currently the site is using an advertising supported revenue model. The company wishes you to consider each of the other revenue models and the potential of strategic alliances that might make sense for this site. Write a report of about 500 words in which you summarize your research and state your recommendations.

Revenue strategy issues

In this section, you will learn about some issues that arise when companies implement the various revenue models described, and how companies deal with those issues as they arise.

Channel conflict and cannibalisation

Companies that have existing sales outlets and distribution networks often worry that their websites will take away sales from those outlets and networks. For example, Levi Strauss & Company sells its Levi's jeans and other clothing products through department stores and other retail outlets. The company began selling jeans to consumers on its website in mid-1998. Many of the department stores and retail outlets that had been loyally selling Levi's products for many years and generating guaranteed revenue from their sale complained to the company that the website was now competing with them. In January 2000, Levi Strauss decided to stop selling products on its own website.

Such a *channel conflict* can occur whenever sales activities on a company's website interfere with its existing sales outlets. The problem is also called *cannibalisation* because the website's sales consume sales that would be made in the company's other sales channels.

Strategic alliances and channel distribution management

When two or more companies join forces to undertake an activity over a long period of time, they are said to create a strategic alliance. Companies form strategic alliances for many purposes. An increasing number of businesses are forming strategic alliances to sell on the web.

Creating an effective web presence

In the physical world, businesses have always created a presence by building stores, factories, warehouses, and office buildings. An organization's presence is the public image it conveys to its stakeholders. The stakeholders of a firm include its consumers, suppliers, employees, stockholders, neighbours, and the general public. Many companies tend not to worry much about the image they project until they grow to a significant size - until then, they are too focused on just surviving to spare the effort. On the web, presence can be much more important. Many consumers and other stakeholders of a web business know the company only through its web presence. Creating an effective web presence can be critical even for the smallest and newest firms operating on the web.

Identifying web presence goals

On the web, businesses and other organizations have the luxury of building their websites intentionally to create distinctive presences. Often, a firm's physical location needs to satisfy so many other business priorities before it can concentrate on conveying a good presence. However, online, a potential customer needs to interact with a firm's website to access their goods or services, so the website helps instantly create a first impression of the business. A good website design can provide many image-creation and image enhancing features very effectively - it can serve as a sales brochure, a product showroom, a financial report, an employment ad, and a consumer contact point. Each entity that establishes a web presence should decide: which task they wish their website to accomplish; which features the website can provide; and which of those features are the most important to include. Goals associated with the establishment of an effective WWW presence include:

- Creating a website that is attractive to many visitors.
- Creating a website with a positive image that is consistent with a company's established brand.
- Creating a website to reinforce already held positive images regarding a company.

However, businesses must not forget what online users want in return. In the early days of the internet many companies failed to recognise that consumers wanted the same level of reassurance when conducting electronic commerce that they got from dealing with real companies in the real world. Often details were not placed on websites regarding contacting the companies and prospective consumers often found that emailed queries did not receive a reply. This situation led to a loss of trust between online shoppers and companies. For such trust to be re-established companies wishing to create a WWW presence should include:

- A detailed history of the company including its aims, objectives and personnel.
- A mission statement outlining the strategic objectives of the company and how these objectives will be met.
- A brief statement of the financial position of the company and also its product portfolio.
- Several methods for contacting the organisation. These methods should include traditional communication channels such as a telephone number and postal addresses.

What is crucial for companies to remember is that consumers require an unrestricted online dialogue with a firm and its other stakeholders. It is imperative that companies provide meaningful ways for two-way communication to take place between themselves and their consumers.

Website usability

Research indicates that few businesses accomplish all of their goals for their websites in their current web presences. Even sites that succeed in achieving most of these goals often fail to provide sufficient interactive contact opportunities for site visitors. Most firms' websites give the general impression that the firm is too important and its employees are too busy to respond to inquiries. One of the main benefits to e-commerce consumers is the ability to quickly compare businesses offering similar services. If a consumer has a frustrating experience on one firm's website, within seconds they will go to another and the firm has lost a customer. Therefore it is beneficial for businesses to consider usability testing.

Usability testing is when a website is evaluated in terms of how easy it is to navigate to a particular piece of information. Usability testing can also be used to establish whether a particular feature on a website is easy to understand and efficient to use. Companies often aim to limit the amount of clicks required to access a particular piece of information to a set number such as three. A group of test users are then asked to navigate through the site to establish, for example, whether more than three clicks are required to access a product or service. If they are, the navigation path to that product or service is redesigned. Although usability testing will vary from website to website the following rules should be adhered to:

- A website should be designed around how visitors will want to travel through it, rather than around a company's organisational structure.
- A website should be designed to allow quick and easy access to as much information as possible.
- A website should not contain over exaggerated marketing claims or unproved comparisons between products offered on the website and those available elsewhere.
- So that it is accessible to various levels of browser software, the website should be designed so that browser software from older computers using slower connections can take advantage of its content - even if it means making multiple versions of the website.
- When designing a website, navigation and user controls should have a clear and consistent design - and where possible be supported by visual clues. It is also advisable to test the website using various colour combinations for text and graphics.

Meeting the needs of website visitors

Businesses that are successful on the web realize that every visitor to their websites is a potential consumer. People who visit a website seldom arrive by accident; they are there for a reason. However, the reasons people do visit may vary considerably – and this needs to be remembered when building the site. Thus, an important concern for businesses crafting web presences is the variation in visitor characteristics.

Although there are many reasons why visitors come to websites it is clear that a policy that aims to cater for different stakeholders is an effective policy. Companies must aim to have websites that are highly flexible, providing text and graphic versions that support frame based browsers and multiple information file formats. It is also important that the website allows users to access multiple levels of detail and information.

Trust and loyalty

When consumers buy any product from a seller, they are also buying an element of service. A seller can create value in a relationship with a consumer by nurturing consumers' trust and developing it into loyalty. Recent studies by business researchers have found that a 5 percent increase in consumer loyalty (measured for example in terms of the proportion of returning consumers) can yield profit increases ranging from 25 percent to 80 percent. Thus establishing customer loyalty can vastly increase revenue.

When a consumer has an experience with a seller who provides good service, that consumer begins to trust the seller. When a consumer has multiple good experiences with a seller, that consumer feels loyal to the seller. Thus, the repetition of satisfactory service can build consumer loyalty that helps prevent a consumer from seeking alternative sellers who offer lower prices. They may also recommend the seller to other potential customers.

Rating electronic commerce websites

Two companies routinely review electronic commerce websites for usability, consumer service, and other factors. Many people have found these review sites to be useful as they decide which sites to patronize. Unfortunately, one of the sites, *Gomez.com*, no longer publishes most of its scorecards for electronic commerce sites. It now sells the information it gathers to the companies that operate the websites and offers suggestions for improvements. *BizRate.com* provides a comparison shopping service and offers links to sites with low prices and good service ratings for specific products.

Consumer-centric website design

Putting the consumer at the centre of all site designs is called a *consumer-centric* approach to website design. Web designers can follow consumer-centric guidelines when creating a website that is intended to meet the specific needs of *consumers*, as opposed to all website visitors. These guidelines include the following:

Consumer-Centric Guidelines:	◆ Design the site around how visitors will navigate the links, not around the company's organizational structure. ◆ Allow visitors to access information quickly. ◆ Avoid using inflated marketing statements in product or service descriptions. ◆ Avoid the use of business jargon and terms that visitors might not understand. ◆ Build the site to work for visitors who are using the oldest browser software on the oldest computer connected through the lowest bandwidth connection—even if this means creating multiple versions of web pages. ◆ Be consistent in use of design features and colours. ◆ Make sure that navigation controls are clearly labelled or otherwise recognizable. ◆ Test text visibility on smaller monitors. ◆ Check to make sure that colour combinations do not impair viewing clarity for colour-blind visitors. ◆ Conduct usability test research by having potential site users navigate through several versions of the site.

Connecting with consumers

An important element of a corporate web presence is communicating with site visitors who are consumers or potential consumers. In this section, you will learn how websites can help firms identify and successfully connect to consumers.

The nature of communication on the web

In business, there are two general ways of identifying and reaching consumers: personal contact and mass media. These two approaches are often called communication modes because they each involve a characteristic way (or mode) of conveying information from one person to another (or communicating). In the personal contact model, the firm's employees individually search for, qualify, and contact potential consumers. This personal contact approach to identifying and reaching consumers is sometimes called prospecting. In the mass media approach, firms prepare advertising and promotional materials about the firm and its products or services. They then deliver these messages to potential consumers by broadcasting them on television or radio, printing them in newspapers or magazines, posting them on highway billboards, or mailing them.

An effective website is a combination of the mass media and personal contact models.
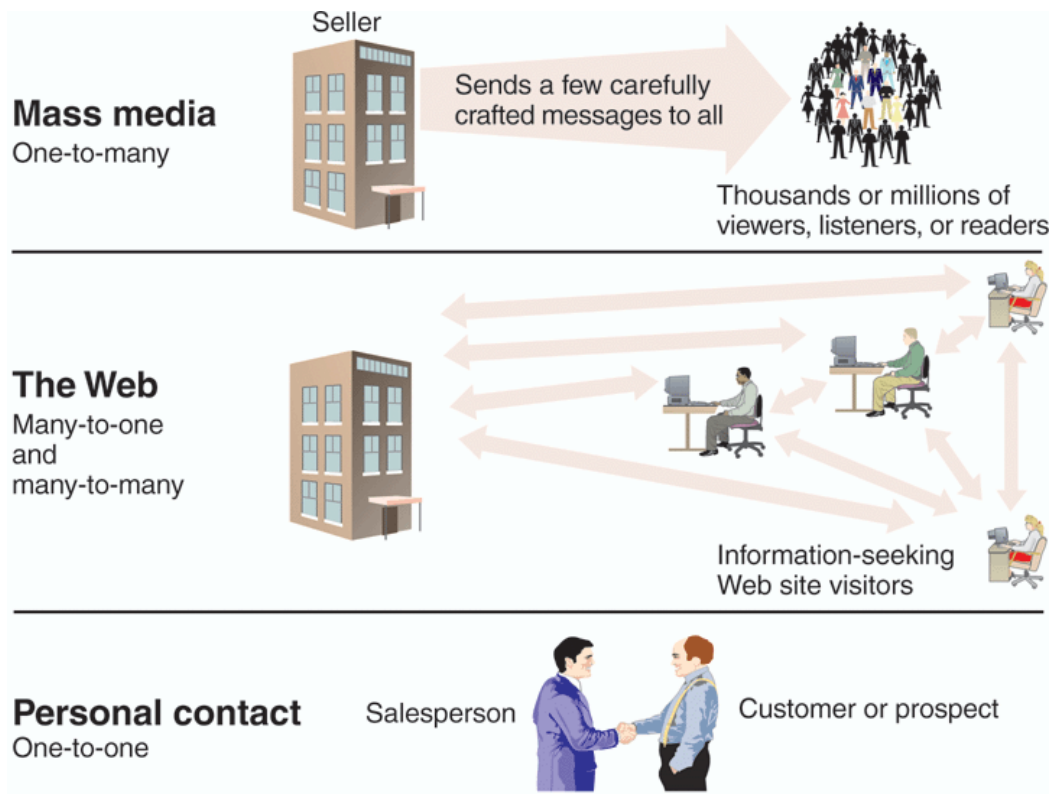
Business communication models

(Schneider 2007: p. 153)

Learning activity

Find a website that you think is successful in creating an effective web presence. Why do you think this website is good? Now find a website that in your opinion is not creating an effective web presence. What are the problems with this website and how could they be resolved?

Measuring website effectiveness

In traditional commerce, there are many different established methods for measuring how effective businesses are when communicating with potential consumers. Approaches include estimates of audience size, response rate, enquiry rate and sales. However, in e-commerce, such measurements are far more difficult to establish. This is because people may visit a site for many different reasons. The visitor is in control over which messages are viewed as they choose which links to follow. Recently, however, several different methods have been used to determine the amount of traffic generated by a website. These measurements include:

- A *visit* is defined to be when a user requests a page from a website. Further pages requested by the user over a given period of time (i.e. five minutes) are counted as part of the visit.
- A *trial visit* is defined to be the first time a user loads a website. After this initial visit all other visits are referred to as *repeat visits*.
- An *advertising view* is defined as being when a page is loaded that contains an advertisement or promotional banner.
- The *click through rate* is defined by the number of times an advertisement is clicked in order to view further details of the product or service being advertised.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. Most web catalogue retailers do not have return policies that allow consumers to return unused merchandise for any reason.

____ 2. Consumer service is usually not a problem for most electronic commerce sites.

____ 3. Firms who own intellectual property or rights to that property have not embraced the web as an efficient distribution mechanism.

____ 4. Most successful advertising on the web is targeted to very specific groups.

____ 5. People spend less time at a sticky website and are thus exposed to very little advertising.

____ 6. Websites that specialize in providing only classified advertising do not have profit potential.

____ 7. Any product that is likely to be useful after the original buyer uses it provides the potential for a classified advertising site.

____ 8. People who visit a website usually arrive by accident.

____ 9. Gift retailers on the web use the advertising-supported revenue model.

____ 10. A large number of websites have sufficient numbers of visitors to attract large advertisers.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. One problem that the web presents for clothing retailers of all types is that ____.
   a.   consumers are unwilling to buy clothing on-line
   b.   colour settings on computer monitors vary widely
   c.   the web catalogue revenue model is not flexible
   d.   online retail sales are not cost effective

____ 12. The ____ of a website is its ability to keep visitors at the site and to attract repeat visitors.
   a.   image   c.   stickiness
   b.   presence   d.   usability

____ 13. Network television in the United States uses the ____ revenue model.
   a.   advertising-supported   c.   fee-for-service
   b.   advertising-subscription mixed   d.   information sales

____ 14. A website that offers insurance policy information, comparisons, and sales is ____.
   a.   YouDecide.com   c.   EBSCO
   b.   Orbitz   d.   Northern Light

40

_____ 15. The _____ is an industry group that tracks computer and video game use.
  a.   Consumers Union   c.   ICANN
  b.   ACM   d.   Entertainment Software Association

_____ 16. _____ have been one of the main forces preventing U.S. professionals from extending their practices on the web.
  a.   Catalogue models   c.   Fulfilment managers
  b.   State laws   d.   Stakeholders

_____ 17. One of the best ways to accommodate a broad range of visitor needs is to build _____ into the website's interface.
  a.   flexibility   c.   conflict
  b.   virtual models   d.   presence

_____ 18. Online banks that have _____ features allow visitors to view all of their bills.
  a.   demographic information   c.   account aggregation
  b.   reintermediation   d.   bill presentment

_____ 19. An effective _____ can be critical even for the smallest and newest firms operating on the web.
  a.   E-zine   c.   disintermediation
  b.   virtual model   d.   web presence

_____ 20. A key goal for many not-for-profit organizations is _____.
  a.   account aggregation   c.   bill presentment
  b.   information dissemination d.   cannibalization

Essay questions

21. An effective site is one that creates an attractive presence that meets the objectives of the business or organization. List at least five common objectives.

22. List at least five reasons why people visit websites.

23. List five goals that businesses should meet when constructing a website, so that it successfully conveys an integrated image and offers information to potential consumers.

24. What are the guidelines that must be followed by web designers when creating a website that is intended to meet the specific needs of consumers?

25. What is the difference between the personal contact model of communicating on the web and the mass market approach?

Chapter 4

4 Marketing on the web

Introduction

In this chapter, you will learn how companies use the web as part of their marketing strategy - to advertise their products and services and promote their reputations. Marketing has influenced all aspects of the commercial market; increasingly, companies classify consumers into groups and create targeted messages for each group. The web has created even smaller targeted groups - in some cases, just one consumer at a time can be targeted. New research into the behaviour of website visitors has even suggested ways in which websites can respond to visitors who arrive at a site with different needs at different times. This chapter will also introduce you to some of the ways companies are making money by selling advertising on their websites.

Student reading

It is strongly advised that you now read Chapter 4 of the recommended course text:

Electronic Commerce
Gary Schneider,
7th ed Paperback, 624 pages
Course Technology, 2007
ISBN: 1418837032

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Discuss when to use product-based and consumer-based marketing strategies.
- Explain how to communicate with different market segments.
- Discuss consumer relationship intensity and the consumer relationship life cycle.
- Evaluate the use and methods of advertising on the web.
- Evaluate the use of e-mail marketing.
- Discuss technology-enabled consumer relationship management.
- Compare and contrast alternative approaches to creating and maintaining brands on the web.

Subject summary

Chapter overview

Marketing mix is the term most companies use to describe the combination of elements they use to achieve their goals for selling and promoting their products and services. When a company decides which elements it will use, it calls that particular marketing mix its *marketing strategy*. As you learned in Chapter 3, companies - even those in the same industry - try to create unique presences in their markets. A company's marketing strategy is an essential tool which interacts with its web presence to convey the company's message to both current and potential consumers.

The four Ps of marketing:

- **Product:** The physical item or service that a company is selling.
- **Price:** The amount the consumer pays for the product.
- **Promotion:** Includes any means of spreading the word about the product. the internet provides many varied possibilities for communicating with existing and potential consumers.
- **Place:** The need to have products or services available in many different locations.

Communicating with different marketing strategies

Identifying groups of potential consumers is just the first step in selling to those consumers. An equally important component of any marketing strategy is the selection of communication media to carry the marketing message.

As an online firm does not have a physical presence, media selection can be critical. The only contact a potential consumer might have with an online firm could well be the image it projects through the media and through its website. The challenge for online businesses is to convince consumers to trust them even though they do not have an immediate physical presence.

Trust and media choice

The web acts as an intermediate step between mass media and personal contact, but it is a very broad step. Using the web to communicate with potential consumers offers many of the advantages of personal contact selling - and many of the cost savings of mass media.

Companies can use the web to capture some of the benefits of personal contact, yet avoid some of the costs inherent in that approach. Most experts agree that it is better to make use of the trust-based model of personal contact when selling on the web, rather than to adopt the mass marketing approach. The development of e-commerce occurred during a particular financial context - rising consumer expectations and reduced product differentiation - leading to increased competition and a splintering of mass markets. The result of this was a reduction in the effectiveness of mass media advertising. Thus, the internet provided a new vehicle for achieving high levels of consumer-focused marketing strategies. Its technology suits market diversity and consumer demand.
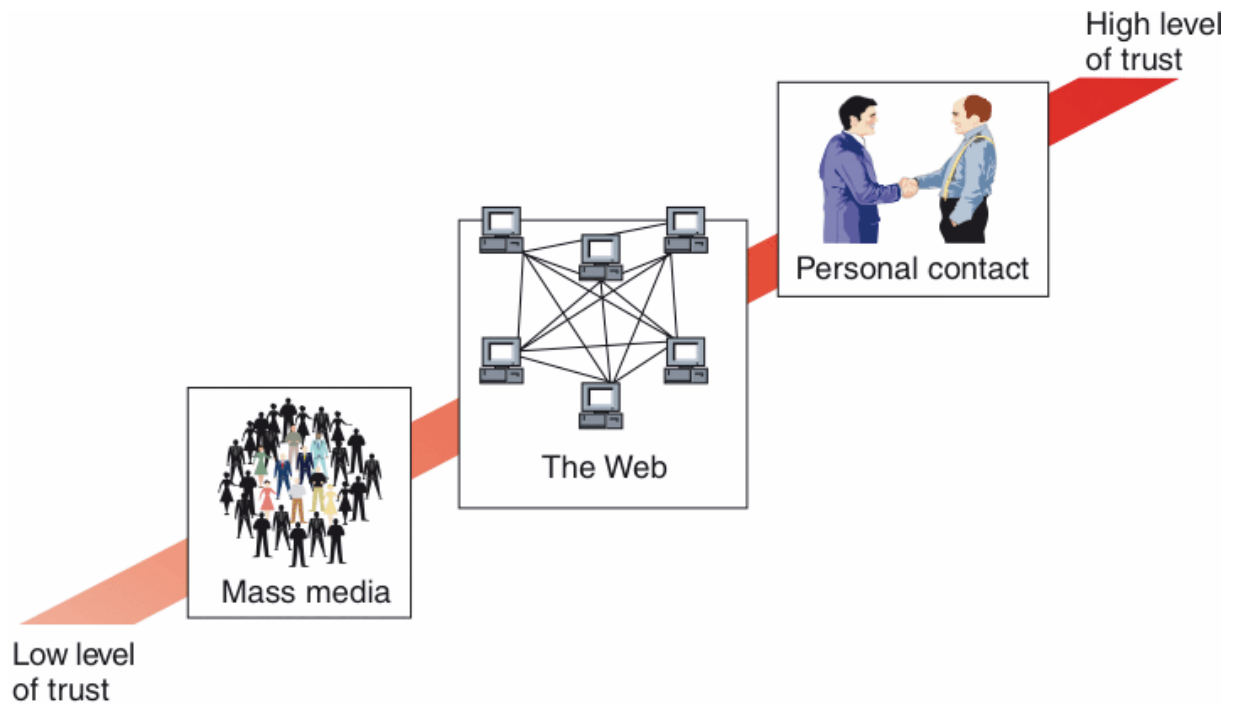
trust in three information dissemination models

(Schneider 2007: 172)

Market segmentation

The response to the decrease in advertising effectiveness was to identify specific portions of their markets and target them with specific advertising messages. This practice, called *market segmentation*, divides the pool of potential consumers into segments. Segments are usually defined in terms of demographic characteristics such as age, gender, marital status, income level, and geographic location. Thus, for example, unmarried men between the ages of 19 and 25 might be one market segment. Other forms of market segmentation are:

- **Micromarketing:** Practice of targeting very small market segments.
- **Geographic segmentation**: Firms divide their consumers into groups by where they live or work.
- **Demographic segmentation**: Uses information about age, gender, family size, income, education, religion, or ethnicity to group consumers.
- **Psychographic segmentation**: Marketers try to group consumers by variables such as social class, personality, or their approach to life.

Market segmentation on the web

The web gives companies an opportunity to present different store environments online. For example, if you visit the home pages of Steve Madden and Talbots, you will find that both pages are well designed and functional. However, they are each directed to different market segments. The Steve Madden site is targeted at young, fashion-conscious buyers. The site uses a wide variety of typefaces, bold graphics, and photos of brightly coloured products to convey its tone. The emphasis is to make an exciting high fashion statement that visitors of the target group can identify with. In contrast, the Talbots site is rendered in a more muted, conservative style. The site is designed for older, more established buyers. The messages emphasized are stability, home life, and the trademark Talbots red doors. These images appeal to a market segment of people looking for classics instead of the latest trends.

Offering consumers a choice on the web

As an example of a very successful e-commerce company, Dell is a useful case to study. Its website offers consumers a number of different ways to do business with the company. Its USA home page includes links for each major group of consumers it has identified, including home, small business, medium and large business, government, education, and health care. Once the site visitor has selected a consumer category, specific products and product categories are available as links.

Beyond market segmentation: consumer behaviour and relationship intensity

Segmentation using consumer behaviour

The development of the web follows – and in some cases, drives - developments within marketing, and has led to increasingly complex and effective marketing strategies. *Behavioural segmentation* is the creation of separate experiences for consumers based on their behaviour. When the behavioural segmentation is based on things that happen at a specific time or occasion, behavioural segmentation is sometimes called *occasion segmentation*.

Marketing researchers are just beginning to study how and why people prefer different combinations of products, services, and website features and how these preferences are affected by their modes of interaction with the site. Market research has found that people want websites to offer a range of interaction possibilities from which they can select to meet their needs. Remember that a particular person might visit a particular website at different times and might search for different interactions each time. Customizing visitor experiences to match the site usage behaviour patterns of each visitor or type of visitor is called *usage-based market segmentation*. Researchers have begun to identify common patterns of behaviour and to categorize those behaviour patterns. One set of categories that marketers use today includes browsers, buyers, and shoppers.

Consumer relationship intensity and life-cycle segmentation

One goal of marketing is to create strong relationships between a company and its consumers. The reason that one-to-one marketing and usage-based segmentation are so valuable is that they help to strengthen companies' relationships with their consumers. Good consumer experiences can help create an intense feeling of loyalty toward the company and its products or services. Researchers have identified several stages of loyalty as consumer relationships develop over time.

Five-stage model of consumer loyalty

- **Awareness:** Consumers who recognize the name of the company or one of its products are in the awareness stage of consumer loyalty.
- **Exploration:** In this stage potential consumers learn more about the company or its products.
- **Familiarity:** Consumers who have completed several transactions and are aware of the company's policies regarding returns, credits, and pricing flexibility are in this stage.
- **Commitment:** After experiencing a considerable number of highly satisfactory encounters with a company, some consumers develop a fierce loyalty or strong preference for the products or brands of that company.
- **Separation:** Over time, the conditions that made the relationship valuable might change. The consumer might be severely disappointed by changes in the level of service (either as provided by the company or as perceived by the consumer) or product quality.
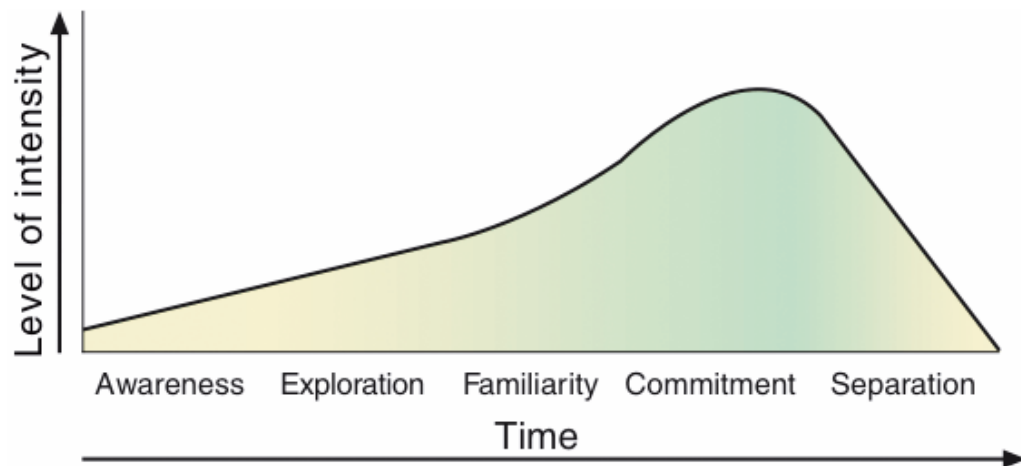
Five stages of customer loyalty

(Schneider 2007: 180)

Acquisition, conversion, and retention of consumers

In e-commerce, new visitor acquisition varies according to the revenue model adopted by the company. For example, an advertising-supported site is interested in attracting as many visitors as possible to the site and then keeping those visitors at the site for as long as possible. In this way, the site displays the maximum amount of advertising messages to its visitors, which is how the site earns a profit. On the other hand, for sites that operate a web catalogue model, charge a fee for services, or that are supported by subscriptions, attracting visitors to the site is only the first step in the process of turning those visitors into consumers. The total amount of money that a site spends, on average, to draw one visitor to the site is called the *acquisition cost*.

The second step that a web business wants to take is to convert the first-time visitor into a consumer. This is called a *conversion*. For advertising-supported sites, the conversion is usually considered to happen when the visitor registers at the site, or, in some cases, when a registered visitor returns to a site several times. For sites with other revenue models, the conversion occurs when the site visitor buys a good or service or subscribes to the site's content. The total amount of money that a site spends, on average, to induce one visitor to make a purchase, sign up for a subscription, or (on an advertising-supported site) register, is called the *conversion cost*.

Consumer acquisition, conversion, and retention: the funnel model

A funnel is a good analogy for the operation of a marketing strategy because almost every marketing strategy starts with a large number of prospects and converts fewer and fewer of those prospects into serious prospects, consumers, and finally, loyal consumers.

Funnel model of customer acquisition, conversion, and retention

(Schneider 2007: p. 184)

Advertising on the web

Most advertising on the web uses *banner ads*. A banner ad is a small rectangular object on a webpage that displays a stationary or moving graphic and includes a hyperlink to the advertiser's website. Banner ads are versatile advertising vehicles. Their graphic images can help increase awareness, and users can click them to open the advertiser's website and learn more about the product. Thus, banner ads can serve both informative and persuasive functions.

Banner ads

♦   **Banner ads:** There are three different ways companies arrange for other websites to display their banner ads. The first is to use a banner exchange network. The second way is to find websites that appeal to one of the company's market segments and then pay those sites to carry the ads. A third way is to use a banner-advertising network.
♦   **Measuring banner ad cost and effectiveness:** When a company purchases mass media advertising, it pays a dollar amount for every thousand people in the estimated audience. This pricing metric is called cost per thousand and is often abbreviated CPM.

Other web ad formats

The steady decline in the effectiveness of banner ads has prompted advertisers to explore other formats for web ads. One of these formats is the *pop-up ad*. A pop-up ad is an ad that appears in its own window when the user opens or closes a webpage. The window in which the ad appears does not include the usual browser controls. The only way to dismiss the ad is to click the small close button in the upper-right corner of the window's frame. Other ad formats are:

- **Pop-behind ad:** A pop-up ad that is followed very quickly by a command that returns the focus to the original browser window.
- **Interstitial ad:** When a user clicks a link to load a page, the interstitial ad opens in its own browser window, instead of the page that the user intended to load.
- **Rich media ads** (**active ads**): Generate graphical activity that "floats" over the webpage itself instead of opening in a separate window.

Sites sponsorships

Some websites offer advertisers the opportunity to sponsor all or parts of their sites. These site sponsorships give advertisers a chance to promote their products, services, or brands in a more subtle way than by placing banner or pop-up ads on the sites (although some sponsorship packages include a certain number of banner and pop-up ads).

Effectiveness of online advertising

After years of experimenting with a variety of online advertising formats, the effectiveness of online advertising remains difficult to measure. A major problem is the lack of a single industry standard measuring service, such as the service that the Nielsen ratings provide for television broadcasting or the Audit Bureau of Circulations procedures provide for the print media. In 2003, the Interactive Advertising Bureau (IAB) and the Institute of Practitioners in Advertising (IPA) created a joint task force to review four media measurement systems (Nielsen//NetRatings, ComScore, Hitwise, and RedSheriff) and recommend one as the single standard or devise an alternative measurement system. The task force has announced that it is currently considering only ComScore and Nielsen//NetRatings.

E-mail marketing and permission marketing

A key element in any e-mail marketing strategy is to obtain consumers' approvals before sending them any e-mail that includes a marketing or promotional message.

Many businesses are finding that they can maintain an effective dialog with their consumers by using automated e-mail communications. Sending one e-mail message to a consumer can cost less than one cent if the company already has the consumer's e-mail address. Purchasing the e-mail addresses of people who ask to receive specific kinds of e-mail messages adds between a few cents and a dollar to the cost of each message sent. Another factor to consider is the conversion rate. The conversion rate of an advertising method is the percentage of recipients who respond to an ad or promotion. Conversion rates on requested e-mail messages range from 10 percent to over 30 percent. These are much higher than the click-through rates on banner ads, which are currently under 0.5 percent and decreasing.

Combining content and advertising

One strategy for getting e-mail accepted by consumers and potential consumers, is to combine content with an advertising e-mail. Many companies have found this to be a successful marketing approach. Offering articles and news stories that are of interest to a specific market segment is a good way to increase acceptance of e-mail.

Outsourcing e-mail processing

Many companies find that the number of consumers who opt-in to information-laden e-mails can grow rapidly. The job of handling e-mail lists and mass-mailing software can quickly outgrow the capacity of the company's information technology staff. A number of companies offer e-mail management services, and most small or medium-size companies outsource their e-mail-processing operations. An e-mail management company will typically manage an e-mail campaign for a cost of between 1 and 2 cents per valid e-mail address.

Technology-enabled consumer relationship management

The nature of the web, with its two-way communication features and traceable connection technology, allows firms to gather much more information about consumer behaviour and preferences than they can gather using micromarketing approaches. Now, companies can measure large amounts of informative data regarding navigational choices, as consumers and potential consumers gather information and make purchasing decisions. The information that a website can gather about its visitors (which pages were viewed, how long each page was viewed, the sequence, and similar data) is called a *clickstream*.

Technology-enabled relationship management has become possible when promoting and selling on the web. This occurs when a firm obtains detailed information about a consumer's behaviour, preferences, needs, and buying patterns. The firm then uses that information to set prices, negotiate terms, tailor promotions, add product features, and otherwise customize its entire relationship with that consumer.

CRM as a source of value in the marketspace

For years, businesses have viewed information as a part of the value chain's supporting activities, but they have not considered how information itself might be a source of value. In the marketspace, firms can use information to create new value for consumers. Many electronic commerce websites today offer consumers the convenience of an online order history, recommendations based on previous purchases, and show current information about products in which the consumer might be interested.

Creating and maintaining brands on the web

A brand name which is known and respected can present a powerful statement to potential consumers. It represents quality, value, and other desirable qualities in one recognizable element. Branded products are easier to advertise and promote, because each product carries the reputation of the brand name. Companies have developed and nurtured their branding programs in the physical marketplace for many years. Consumer brands such as Ivory soap, Walt Disney entertainment, Maytag appliances, and Ford automobiles have been developed over many years with the expenditure of tremendous amounts of money. However, the value of these and other trusted major brands far exceeds the cost of creating them.

Elements of branding:

- **Product differentiation**: The first condition that must be met to create a product or service brand.
- **Relevance:** The degree to which the product offers utility to a potential consumer.
- **Perceived value:** A key element in creating a brand that has value.

Emotional branding vs. rational branding

Companies have traditionally used emotional appeals in their advertising and promotion efforts to establish and maintain brands. One branding expert, Ted Leonhardt, has described "brand" as "an emotional shortcut between a company and its consumer." These emotional appeals work well on television, radio, billboards, and in print media, because the ad targets are in a passive mode of information acceptance. However, emotional appeals are difficult to convey on the web because it is an active medium controlled to a great extent by the consumer. Many web users are actively engaged in such activities as finding information, buying airline tickets, making hotel reservations, and obtaining weather forecasts. These users are busy people who will rapidly click away from emotional appeals. As an alternative, rational branding is based on the principle of value exchange in which goods and services are exchanged between the company and prospective consumers in payment for prospective consumers viewing advertising. Rational branding is a popular strategy for WWW marketers to create and maintain brands online.

Brand leveraging strategies

There are many other ways to build brands on the web. One method that is working for well-established websites is to extend their dominant positions to other products and services, a strategy called *brand leveraging*. Yahoo! is an excellent example of a company that has used brand-leveraging strategies. Yahoo! was one of the first directories on the web. It added a search engine function early on in its development and has continued to maintain its leading position by acquiring other web businesses and expanding its existing offerings. Yahoo! acquired GeoCities and Broadcast.com, and entered into an extensive cross-promotion partnership with a number of Fox entertainment and media companies. Thus it used its influence in the market to highlight to its users services offered by other companies it had teamed up with. Yahoo! continues to lead its two nearest competitors, Excite and Go.com, in ad revenue by adding features that web users find useful and that increase the site's value to advertisers.

Brand consolidation strategies

Brand consolidation takes brand leverage one stage further and actively twins two or more companies together, usually to a specific target market. This was pioneered by Della & James, an online bridal registry that is now doing business as part of WeddingChannel.com. Although a number of national department store chains, such as Macy's, had established online registries for their own stores, Della & James created a single registry that connected to several local and national department and gift stores, including Crate&Barrel, Gump's, Neiman Marcus, Tiffany & Co., and Williams-Sonoma. The logo and branding of each participating store are featured prominently on the WeddingChannel.com site. The founders identified an opening for a market intermediary because specific research showed that the average couple engaged to be married registers at three different stores. Thus, WeddingChannel.com provides a valuable consolidating activity for registering couples and their wedding guests that no store operating alone could provide.

Costs of branding

It is much easier to transfer an existing brand to the web, or use the web to maintain an existing brand, rather than creating an entirely new brand on the web. This has proved to be much more difficult – and expensive. In 1998, a large number of companies spent significant amounts of money on building new brands on the web. According to studies by the Intermarket Group, each of the top 100 electronic commerce sites spent an average of $8 million in that one year to create and build their online brands. Two of the brands that battled it out at the top of the spending bracket included Amazon.com, which spent $133 million, and BarnesandNoble.com, which spent $70 million. Most of this spending was for television, radio, and print media - not for online advertising. Online brokerages E*TRADE and Ameritrade Holding were also among the top five in that first year of major brand building on the web, spending $71 million and $44 million, respectively.

Learning activity

Think of a traditional company (i.e., not an internet based company) that has a strong brand image. Look at the website(s) owned by this company and write 1,000 words discussing how the company has transferred their brand image onto the internet.

Affiliate marketing strategies

Affiliate marketing is when one firm includes details, descriptions, reviews, ratings, or other information about another company's product on its (the affiliate firm) website. The consumer will be able to click on the information and go straight to the other firm's site to buy the product. For every visitor who follows a link from the affiliate's site to the seller's site, the affiliate site receives a commission.

One of the more interesting marketing tactics made possible by the web is *cause marketing*, which is an affiliate marketing program that benefits a charitable organization (and, thus, supports a "cause"). In cause marketing, the affiliate site is created to benefit the charitable organization. When visitors click a link on the affiliate's webpage, a donation is made by a sponsoring company. The page that loads after the visitor clicks the donation link carries advertising for the sponsoring companies. Research demonstrates that the click-through rates on these ads are much higher than the typical banner ad click-through rates.

Viral marketing strategies

Viral marketing uses satisfied customers to tell potential customers about products or services they have enjoyed using. Much as affiliate marketing uses websites to spread the word about a company, viral marketing approaches use individual consumers to do the same thing. It is called viral marketing because it reaches increasing numbers of consumers in the same way that a virus multiplies and spreads.

Search engine positioning and domain names

Research demonstrates that potential consumers find websites in many different ways. Some site visitors are referred by a friend. Others are referred by an affiliate marketing partner of the site. Some see the site's URL in a print advertisement or on television. Others arrive after typing a URL that is similar to the company's name. But many site visitors are directed to the site by a search engine or directory website.

Search engines and web directories

Search engines are websites that help people find what they are looking for in the vast cyberspace arena. Search engines contain three major parts. The first part, called a spider, a crawler, or a robot (or simply bot), is a program that automatically searches the web to find web pages that might be interesting to people. When the spider finds web pages that might interest search engine site visitors, it collects the URL of the page and information contained on the page. This information might include the page's title, key words included in the page's text, and information about other pages on that website. In addition to words that appear on the webpage, website designers can specify additional key words in the page that are hidden from the view of website visitors, but that are visible to spiders. These key words are enclosed in an HTML tag set called meta tags. The word "meta" is used for this tag set to indicate that the key words describe the content of a webpage and are not themselves part of the content.

The spider returns this information to the second part of the search engine to be stored. The storage element of a search engine is called its index or database. The index checks to see if information about the webpage is already stored. If it is, it compares the stored information to the new information and determines whether to update the page information. The index is designed to allow fast searches of its very large amount of stored information.

The third part of the search engine is the search utility. Visitors to the search engine site enter a term – part of a word, a word, or words - they wish to search, and the search utility takes those terms and finds entries for web pages in its index that match those search terms. The search utility is a program in itself: it creates a webpage which appears to the visitor as a list of links to URLs. The visitor can then click the links to visit those sites.

Paid search engine inclusion and placement

As the internet continues to grow rapidly, the amount of potential information matching a search term can seem daunting to a visitor – and exasperating to a business if their company does not appear high on the list. An increasing number of search engine sites have started making the task easier—but for a price. These search engine sites offer companies a paid placement which is the option of purchasing a top listing on results pages for a particular set of search terms. This is also called a sponsorship or a search term sponsorship; however, note that these search term sponsorships are not the same thing as

the general site sponsorships you learned about earlier in this chapter. The rates charged vary tremendously depending on the desirability of the search terms to potential sponsors.

Website naming issues

Obtaining identifiable names to use on the web can be an important part of establishing a web presence that is consistent with the company's existing image in the physical world. Companies that have a well-established brand name or reputation in a particular line of business usually want the URLs for their websites to reflect that name or reputation.

Misnaming websites can lead to customer frustration and eventual customer loss. Two airlines that started their online businesses with troublesome domain names have both now purchased more suitable domain names. Southwest Airlines' domain name was www.iflyswa.com until it purchased www.southwest.com. Delta Air Lines' original domain name was www.delta-air.com. After several years of complaints from confused consumers who could never remember to include the hyphen, the company purchased the domain name www.delta.com.

Companies often buy more than one domain name. Some companies buy additional domain names to ensure that potential site visitors who misspell the URL will still be redirected (through the misspelled URL) to the intended site. For example, Yahoo! owns the name Yahow.com. Other companies own many URLs because they have many different names or forms of names associated with them.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. In the four Ps of marketing, the issue of place is the need to have products or services available in many different locations.

____ 2. In a virtual world, companies can convey a large part of their message by the way they construct buildings and design their floor space.

____ 3. Using the web to communicate with potential consumers offers many of the cost savings of mass media but none of the advantages of personal contact selling.

____ 4. Mass media offers the highest level of trust.

____ 5. Media selection is critical for an online firm because it does not have a physical presence.

____ 6. The benefits of acquiring new visitors are the same for web businesses with different revenue models.

____ 7. A banner ad is a small rectangular object on a webpage that displays a stationary or moving graphic without a hyperlink to the advertiser.

____ 8. Emotional branding works well on the web.

____ 9. The web expands the types of communication channels available.

____ 10. Companies often buy more than one domain name.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. The costs of inducing consumers to return to a website and buy again are called ____.
   a.   CPMs   c.   retention costs
   b.   acquisition costs   d.   conversion costs

____ 12. A(n) ____ coordinates ad sharing so that other sites run one company's ad while that company's site runs other exchange members' ads.
   a.   banner exchange network   c.   banner replacement network
   b.   banner discount network   d.   banner link network

____ 13. ____ relationship management occurs when a firm obtains detailed information about a consumer's behaviour, preferences, needs, and buying patterns and uses that information to set prices, negotiate terms, tailor promotions, add product features, and otherwise customize its entire relationship with that consumer.
   a.   Technology-enabled   c.   Product-based
   b.   Communication-enabled   d.   Relationship-based

____ 14. The information that a website can gather about its visitors is called a(n) ____.
      a.   clickstream   c.   marketing mix
      b.   ad view   d.   occasion segmentation

____ 15. ____ is the first condition that must be met to create a product or service brand.
      a.   Product differentiation   c.   Relevance
      b.   Perceived value   d.   Permission marketing

____ 16. Companies have traditionally used ____ appeals in their advertising and promotion efforts to establish and maintain brands.
      a.   permitted   c.   rational
      b.   perceived   d.   emotional

____ 17. ____ appeals work well on television, radio, and in printed media, because the ad targets are in a passive mode of information acceptance.
      a.   Emotional   c.   Rational
      b.   Perceived   d.   Permitted

____ 18. Companies that use ____ branding offer to help web users in some way in exchange for their viewing an ad.
      a.   emotional   c.   rational
      b.   perceived   d.   permitted

____ 19. ____ relies on the cognitive appeal of the specific help offered, not on a broad emotional appeal.
      a.   Rational branding   c.   Cognitive branding
      b.   Emotional branding   d.   Market appeal

____ 20. When visitors click a link on the affiliate's webpage, a donation is made by a(n) ____ company.
      a.   advertising   c.   not-for-profit
      b.   marketing   d.   sponsoring

Essay questions

21. When would you use a product-based marketing strategy?

22. When does technology-enabled relationship management occur?

23. Brands can lose their value if the environment in which they have been successful changes. Show how this is possible by giving an example.

24. A study conducted by McKinsey & company examined the online behaviour of 50,000 active internet users and identified six different groups. Provide a brief description of the following categories: Simplifiers, Surfers, Connectors, and Sportsters.

25. Identify and describe the three techniques used by companies to arrange for other websites to display their banner ads.

Notes

Chapter 5

5 Business-to-business strategies: from electronic data interchange to electronic commerce

Introduction

This chapter will demonstrate how companies use electronic commerce to improve their business to business strategies; from their primary - purchasing and logistics activities - to all of their support activities. This work is vital to businesses as it can potentially reduce costs and increase efficiency. As e-commerce becomes more widespread, these elements are becoming more finely tuned and are developing all the time. Internet technologies are now becoming commonplace in businesses, so the potential for synergy has increased. Many of these synergies are forming the basis for second-wave electronic commerce opportunities. You will learn about a number of these second-wave opportunities in this chapter.

Student reading

It is strongly advised that you now read Chapter 5 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Outline the strategies that businesses use to improve purchasing, logistics, and other support activities.
- Explain how electronic data interchange works in practice.
- Describe how businesses have moved some of their electronic data interchange operations to the internet.
- Discuss supply chain management and how businesses are using internet technologies to improve it.
- Describe electronic marketplaces and portals and how they make purchase-sale negotiations easier and more efficient.

Subject summary

Chapter overview

This chapter provides an overview regarding the purchasing, logistics and other support activities required to conduct electronic commerce. It outlines the concept of a network organisation that allows businesses to extend beyond their traditional limits in terms of how they are organised. In addition, you will also find details of the use of EDI mechanisms and how these are now being transferred to the internet. Finally, the chapter investigates the nature of supply chain management and the software packages used for business-to-business electronic commerce and supply chain management.

Purchasing, logistics, and support activities

Flexibility is the emerging characteristic of many areas of e-commerce, including the business activities of purchasing, logistics, and support strategies. These strategies are changing all the time – what works this year may not work next year. Fortunately, economic organizations are evolving from the hierarchical structures used since the Industrial Revolution to new, more flexible network structures. Developing technology reflects and supports potentially vast changes to business network structures. In many cases, companies can reduce transaction and other costs when they use internet and web technologies to carry out business processes.

Purchasing, logistics and support activities can benefit very significantly from using electronic commerce. The bid/order processing time can be reduced, as well as the paper work costs. Lower transaction costs are also realised because electronic commerce can provide a wider range of supply alternatives and the competition puts a downward pressure on purchase prices. Frequently, the process is more convenient to use and requires a smaller number of employees. On the supplier's side, electronic commerce makes production planning easier by reducing the lag time between bids and accepted orders.

Purchasing activities

Purchasing activities include identifying vendors, evaluating vendors, selecting specific products, placing orders, and resolving any issues that arise after receiving the ordered goods or services. These issues might include late deliveries, incorrect quantities, incorrect items, and defective items. By monitoring all relevant elements of purchase transactions, purchasing managers can play an important role in maintaining and improving product quality and reducing cost.

The key purchasing activities include:

- Identifying and evaluating prospective suppliers.
- Specifying products.
- Placing orders.
- Resolving issues after receiving the goods or services.

There are many specialised websites that exist to offer high levels of product knowledge. Such websites can be used to evaluate products, contrast services offered and compare prices charged.
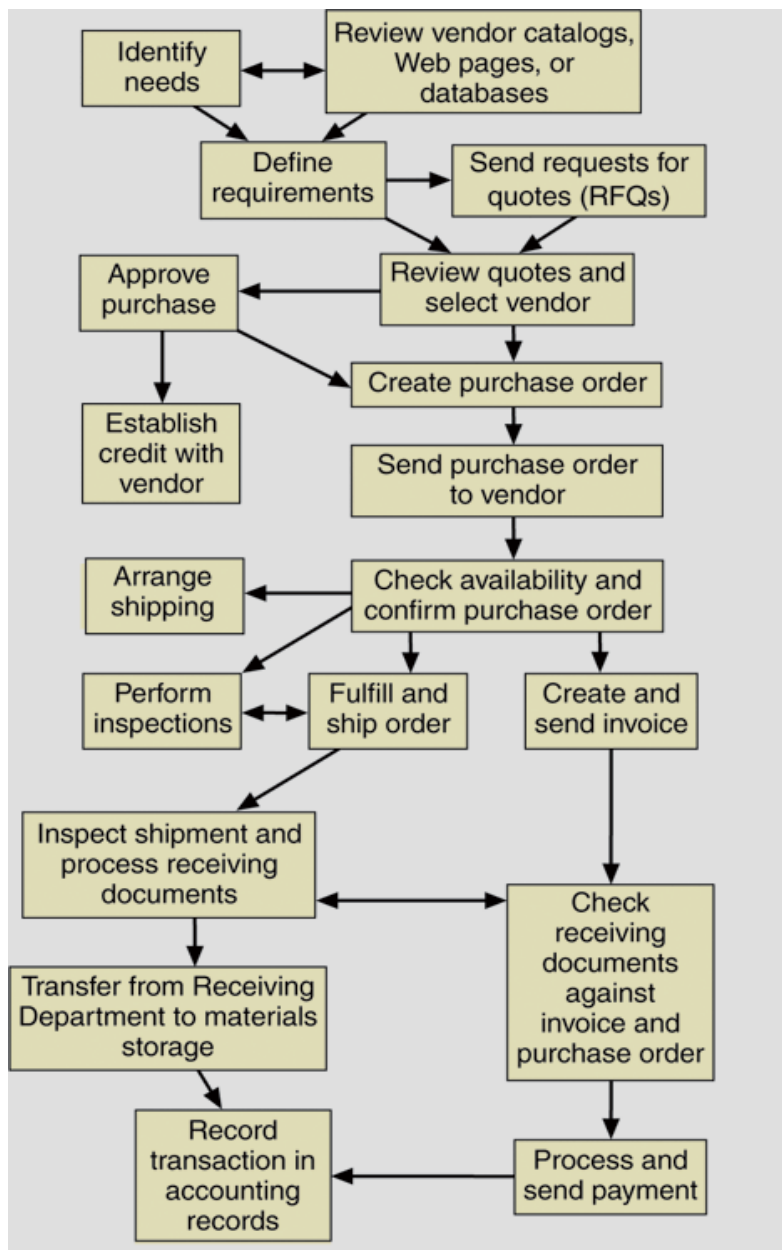
Steps in a typical business purchase process

(Schneider 2007: p.221)

Direct vs. indirect materials purchasing

In business, there is a distinction between direct and indirect materials. Direct materials are those that become part of the finished product in a manufacturing process. Steel manufacturers, for example, consider the iron ore that they buy to be a direct material. As the cost of direct materials is usually a very large part of the cost of the finished product, the procurement process for direct materials is an important part of any manufacturing business. Large manufacturing companies, such as auto manufacturers, engage in two types of direct materials purchasing. In the first type, called *replenishment purchasing* (or contract purchasing), the company negotiates long-term contracts for most of the materials that it will need. For example, an auto manufacturer estimates how many cars it will make during a year and contracts with two or three steel mills to supply most of the steel it will need to build those cars. By negotiating the contracts in advance and guaranteeing the purchase, the auto manufacturer obtains low prices and good delivery terms. Of course, actual demand never matches

expected demand perfectly. If demand is higher than the auto company's estimate, it must buy additional steel during the year. These purchases are made in a loosely organized market that includes steel mills, warehouses, speculators (who buy and sell contracts for future delivery of steel), and companies that have excess steel that they purchased on contract (in other words, demand for their products was lower than they had anticipated). This market is called a spot market, and buying in this market, the second type of direct materials purchasing, is called *spot purchasing*. Indirect materials are all other materials that the company purchases, including factory supplies such as sandpaper, hand tools, and replacement parts for manufacturing machinery.

Logistics activities

Logistics is concerned with providing the right goods in the right quantities at the right time. In order for this to be achieved, effective management must take place during the inbound movement of material and supplies and the outbound movement of finished goods and services.

Efficient logistics activities have been the goal of every commercial trader since commercial trading began. Therefore, logistics management is a vital support activity for both the sales and the purchasing activities in a company. Businesses need to ensure that the raw materials they buy from vendors and use to create their products arrive when needed - and that the products they sell to consumers are delivered on time. Another critical element of logistics is the management of materials as they pass through different production phases: for example, from the raw materials storage area, through their production processes, on to finally becoming finished goods.

Logistics activities include managing the inbound movements of materials and supplies - and the outbound movements of finished goods and services. Thus, receiving, warehousing, controlling inventory, scheduling and controlling vehicles, and distributing finished goods are all logistics activities. Clearly, web and internet technologies provide an increasing number of opportunities to manage these activities more effectively. They can lower transaction costs, and also provide constant connectivity between firms and departments engaged in logistics management.

Learning activity

Consider a parcel delivery service whose main point of contact with its clients is via its website. Draw a flowchart (similar to the one on page 62) which outlines all of the steps which take place from the time the client initially accesses the website to the time when the parcel is delivered.

Support activities

Every business needs supporting activities to interact and underpin every area of its production. As with logistic activities, internet technology can greatly inform and facilitate this essential business practice. Support activities include the general categories of finance and administration, human resources, and technology development. Finance and administration includes activities such as making payments, processing payments received from consumers, planning capital expenditures, and budgeting and planning to ensure that sufficient funds will be available to meet the organization's obligations as they become due. The operation of the computing infrastructure of the organization is also an administration activity. Human resources activities include hiring, training, and evaluating employees; administering benefits; and complying with government regulations, legislation, and legal obligations. Technology development can include a wide variety of activities, depending on the nature of the business or organization. It can include networking research scientists into virtual collaborative workgroups, posting research results, publishing research papers online, and providing connections to outside sources of research and development services.

E-government

Government agencies are increasingly utilising the internet to enable the smooth running of their activities. Although governments do not typically sell products or services to consumers, they perform many functions for their stakeholders. Many of these functions can be enhanced by the use of electronic commerce. Governments also operate businesslike activities; for example, they employ people, buy supplies from vendors, and distribute benefit payments of many kinds. They also collect a variety of taxes and fees from their constituents. The use of electronic commerce by governments and government agencies to perform these functions is often called *e-government*.

Network model of economic organization

One trend that is becoming clear in purchasing, logistics, and support activities is the shift away from hierarchical structures toward network structures. This transition mirrors and is aided by the development of e-commerce. The traditional purchasing model had one hierarchically structured firm negotiating purchase terms with several similarly structured supplier firms - playing each supplier against the others. As is typical in a network organization, more businesses are now giving their Procurement Departments new tools to negotiate with suppliers, including the possibility of forming strategic alliances. For example, a buying firm might enter into an alliance with a supplier to develop a new technology that will reduce overall product costs. The technology development might be done by a third firm using research conducted by a fourth firm. When a network model works at its best, each network participant benefits the production of other participants in the network.

Creating network organisations

Electronic commerce is driving a trend away from hierarchical organisations towards networked organisations in purchasing, logistics and support activities. Highly specialised firms of all sizes can now trade with one another or form partnership arrangements very efficiently on the WWW.

Electronic data interchange

Electronic data interchange (EDI) is a computer-to-computer transfer of business information between two businesses that uses a standard format of some kind. EDI has a longer history than the internet but has been greatly aided by its development. The two businesses that are exchanging information are trading partners. Firms that exchange data in specific standard formats are said to be EDI compatible. The business information exchanged is often transaction data; however, it can also include other information related to transactions, such as price quotes and order-status inquiries.

Information transfer arrangements between businesses has historically been a paper trail of printed purchase orders, invoices, cheques, remittance advices and other commercial documents. Only firms with a high volume of transactions in common could justify computerising their inter-company transfers. Information transfer over telephone lines was more efficient - however only larger firms with a high volume of common transactions could afford the hardware and translation programs required. Digitised information coded in a common format can be economically and efficiently transferred over the internet, intranets or extranets between trading partners. The full realisation of these EDI efficiencies and economies of scale require standards that can be used by all companies in all industries.

Early business information interchange efforts:

- **1950s** - Companies began to use computers to store and process internal transaction records.
- **1960s** – Businesses that engaged in large volumes of transactions with each other had begun exchanging transaction information on punched cards or magnetic tape.
- **1968** - A number of freight and shipping companies joined together to form the Transportation Data Coordinating Committee (TDCC), which was asked to explore ways to reduce the paperwork burden that faced shippers and carriers.

Emergence of broader EDI standards

Across the board agreement of acceptable EDI standards has been a complex journey. After a decade of fragmented attempts at setting broader EDI standards, a number of industry groups and several large companies decided to mount a major effort to create a set of cross-industry standards for electronic components, mechanical equipment, and other widely used items. The American National Standards Institute (ANSI) has been the coordinating body for standards in the United States since 1918. ANSI does not set standards itself, but it has created a set of procedures for the development of national standards and it accredits committees that follow those procedures.

How EDI works

Although the basic idea behind EDI is straightforward, its implementation can be complicated, even in fairly simple business situations. For example, consider a company that needs a replacement for one of its metal-cutting machines. The two figures below demonstrate the steps involved in making this purchase using a paper-based system, and then reveals how the process would change using EDI.
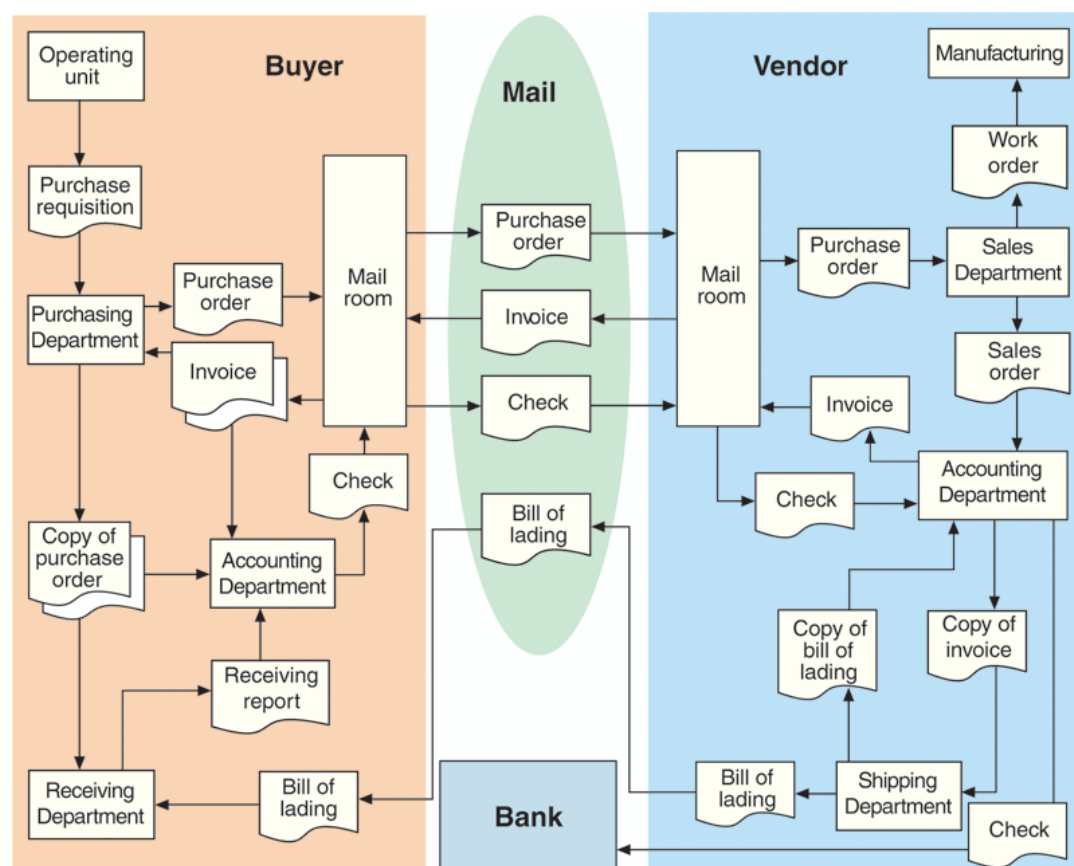
Information flows in a paper-based purchasing process

(Schneider 2007: p. 234)
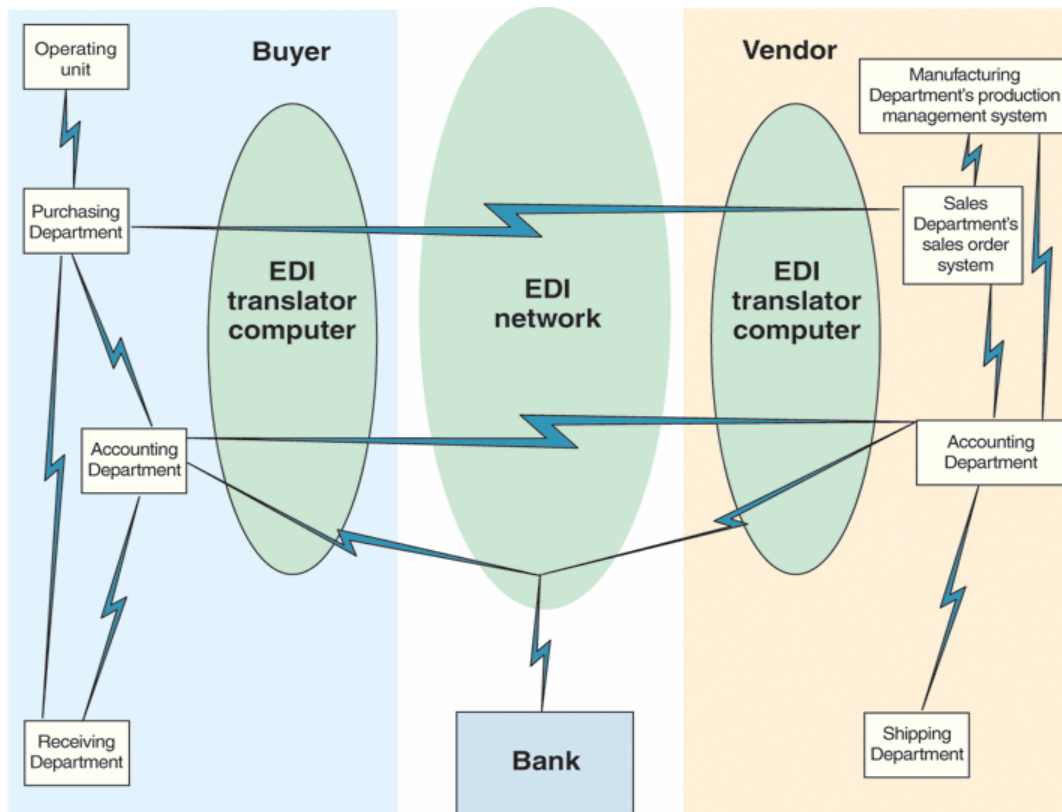
Information flows in an EDI purchasing process

(Schneider 2007: 235)

Value-added networks

EDI networks and translation processes can be executed by trading partners in various ways. Each of these ways is defined by one of two basic approaches: either direct connection or indirect connection. Direct connection EDI requires each business in the network to operate its own on-site EDI translator computer. These EDI translator computers are then connected directly to each other using modems and dial-up telephone lines or dedicated leased lines. However, this choice can be problematic. The dial-up option can present difficulties when consumers or vendors are located in different time zones, and when transactions are time sensitive or high in volume. The dedicated leased-line option can become very expensive for businesses that must maintain many connections with consumers or vendors. Trading partners that use different communications protocols can make either of the direct connection methods difficult to implement.

The indirect connection EDI approach is so-called because the trading partners pass messages through a value-added network (VAN) instead of connecting their computers directly to each other. A value-added network (VAN) is a company that provides communications equipment, software, and skills needed to receive, store, and forward electronic messages that contain EDI transaction sets. To use the services of a VAN, a company must install EDI translator software that is compatible with the VAN. Often, the VAN supplies this software as part of its operating agreement.

To send an EDI transaction set to a trading partner, the VAN consumer connects to the VAN using a dedicated or dial-up telephone line and then forwards the EDI formatted message to the VAN. The VAN logs the message and delivers it to the trading partner's mailbox on the VAN computer. The trading partner then dials in to the VAN and retrieves its EDI-formatted messages from that mailbox.

Advantages of using a value added network (VAN)

The advantages of using a VAN include an audit log, which provides an independent record of transactions for the user, and an automatic compliance check to ensure that its user transaction set is in the appropriate format. In addition, the VAN can provide translation between different transaction sets used by the trading partners. The users only need to support the VAN's singular communication protocol instead of the various protocols used by the trading partners.

However, companies need to consider the cost implications before implementing the use of a VAN. Initially it may appear more cost effective than direct connection EDI. Nevertheless, the enrolment fee, maintenance fees and transaction charges, as well as the investment in translator software, must be matched against the expected benefits to the firm. Many vendors have been forced into bearing the costs of participating in EDI to satisfy the needs of a few large consumers. Recently, firms began looking towards the internet as a communications medium that may be capable of overcoming some of the disadvantages of traditional EDI.

EDI on the internet

Some business economists believe the internet could be a potential replacement for the expensive leased lines and dial-up connections used to support both direct and VAN-aided EDI. As an enabling technology, the internet could give smaller firms the opportunity to supply large consumers who are demanding EDI capability from their vendors. The major barrier to conducting EDI over the internet is the overall concerns about security and the internet's general inability to provide audit logs as well as third party verification of message transmission and delivery. Internet security protocols such as SHTTP and various encryption schemes have mitigated the former concern; however the latter continues to be an issue.

Open architecture of the internet

The development of the internet included a number of firms providing internet EDI, or web EDI services in the mid-1990s. Companies that originally provided traditional VAN services now offer EDI on the internet, along with a number of new companies that entered the market with their internet EDI services. EDI on the internet is called internet EDI or web EDI. It is also called open EDI because the internet is an open architecture network. Many of the new EDI offerings go beyond traditional EDI and help trading partners accomplish information interchanges that are more complex than the EDI standard transaction sets.

Financial EDI

EDI is currently undergoing a period of growth and flexibility, offering beneficial interchange solutions to many trading partners. However, some elements of EDI can still be difficult to transfer to web technology. The EDI transaction sets that provide instructions to a trading partner's bank are called financial EDI (FEDI). All banks have the ability to perform electronic funds transfers (EFTs), which are the movement of money from one bank account to another. The bank accounts involved in EFTs may be consumer accounts or the accounts that banks keep on their own behalf with each other. When EFTs involve two banks, they are executed using an automated clearing house (ACH) system, which is a service that banks use to manage their accounts with each other. In the United States, banks can use the ACH operated by the U.S. Federal Reserve Banks or one of the private ACHs operated by a group of banks or a separate company. EDI-capable banks are banks that are equipped to exchange payment and remittance data through VANs. Some banks also offer VAN services for nonfinancial transactions. These banks are called value-added banks (VABs).

Supply chain management using internet technologies

The aim of supply chain management is to achieve a higher-quality or lower-cost product at the end of the chain. Supply chain management is the management of integration activities between a company's supply management and logistics departments, often involving multiple participants.

Value creation in the supply chain

Originally, supply chain management focused on very specific elements in a supply chain, to identify areas which could be processed more efficiently, with the ultimate goal of reducing cost. However, it has developed to also include looking for opportunities to add value which will be beneficial to the end-of-chain consumer. This requires a more holistic view of the entire supply chain than had been common in the early days of supply chain management.

Businesses that engage in supply chain management work to establish long-term relationships with a small number of very capable suppliers. These suppliers, called tier one suppliers, in turn, develop long-term relationships with a larger number of suppliers that provide components and raw materials to them. These tier two suppliers manage relationships with the next level of suppliers, called tier three suppliers, who provide them with components and raw materials. A key element of these relationships is trust between the parties. The long-term relationships created among participants in the supply chain are called supply alliances.

Clear communications, and quick responses to those communications, are a key element of successful supply chain management. Technologies, and especially the technologies of the internet and the web, can be very effective communications enhancers. For the first time, firms can effectively manage the details of their own internal processes and the processes of other members of their supply chains. Software that uses the internet can help all members of the supply chain review past performance, monitor current performance, and predict when and how much of certain products need to be produced.

Advantages of using supply chain management:

Suppliers can:
- Share information about consumer demand fluctuations.
- Receive rapid notification of product design changes and adjustments.
- Provide specifications and drawings more efficiently.
- Increase the speed of processing transactions.
- Reduce the cost of handling transactions.
- Reduce errors in entering transaction data.
- Share information about defect rates and types.

Increasing supply chain efficiencies

Internet technologies have proved very beneficial to the management of supply chains, and many companies now utilise the web in this area of their business. They can increase efficiency, increase process speed, reduce costs, and increase manufacturing flexibility so that they can respond to changes in the quantity and nature of ultimate consumer demand.

Using materials-tracking technologies with EDI and electronic commerce

The internet is not the only type of technology to have improved and subsequently become beneficial to the management of supply chains. Many different types of businesses, especially those operating in the second wave of e-commerce, are integrating new types of tracking into their internet-based materials-tracking systems. The most promising technological development now being used is radio frequency identification devices (RFIDs), which are small chips that use radio transmissions to track inventory. RFID technology has existed for many years, but until recently, it required each RFID to have its own power supply (usually a battery). Using RFID technology is beneficial to many levels of a supply

chain. For example, both businesses and consumers can use services offered on the web to track the status of their order or delivery.

Creating an ultimate consumer orientation in the supply chain

Tracking technologies as described in the previous paragraph, are part of an overall approach that is developing in supply chain management – to include at each stage a longer-sighted view of the supply chain's ultimate goal – the needs of the consumer at the end of the chain. Companies in industries with long supply chains have, in the past, often found it difficult to maintain this consumer focus, which is often called an ultimate consumer orientation. Instead, companies have directed their efforts toward meeting the needs of the next member in the supply chain. This short-sighted approach can cause companies to miss opportunities to add value in subsequent steps of the chain.

Building and maintaining trust in the supply chain

Building and maintaining trust is the major issue that most companies must deal with in forming supply chain alliances. Continual communication and information sharing are key elements in developing this trust. Because the internet and the web provide excellent ways to communicate and share information, they offer new avenues for building trust. Most procurement professionals have built trust during years of establishing and maintaining relationships over a period of years in many cases with the same vendors. In many industries, vendors send sales representatives to call on buyers regularly. Vendors also participate actively in trade shows and conferences. By enabling interaction between vendors and buyers, trust is created and nurtured.

Electronic marketplaces and portals

Early in e-commerce history, many predicted that vertical portals would change business forever – however, this did not turn out to be exactly correct. In this section, you will learn how B2B electronic marketplaces were conceived, developed, and operated as this sector of electronic commerce matured from 1997 through to the present day.

Independent industry marketplaces

Initially, vertical portal models were focused on a particular industry and companies launched industry information hubs that followed this model. These hubs would offer a doorway – or portal – to the internet and links to various types of information regarding their particular industry. These vertical portals became known by various names that highlighted different elements of their collective nature, including industry marketplaces (focused on a single industry), independent exchanges (not controlled by a company that was an established buyer or seller in the industry), or public marketplaces (open to new buyers and sellers just entering the industry). These portals are also known collectively as independent industry marketplaces. The first e-commerce 'boom' – up to the year 2000 – saw an explosion of these types of web marketplaces. However, after the 'bust', many of them ceased operation as they rarely made a profit.

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Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. An emerging characteristic of purchasing, logistics, and support activities is that they need to be flexible.

____ 2. FedEx and UPS have freight-tracking web pages available to their consumers.

____ 3. Online Benefits is a firm that duplicates its clients' human resource functions on a password-protected website that is accessible to clients' employees.

____ 4. In 1999, Ericsson launched a website to facilitate knowledge management.

____ 5. Most B2C electronic commerce is an adaptation of EDI.

____ 6. The ASC X12 organization and the UN/EDIFACT group agreed in late 2000 to develop one common set of international standards.

____ 7. The up-front cost of implementing indirect connection EDI, including software, VAN enrolment fee, and hardware, typically exceeds $500,000.

____ 8. Ventro opened its first industry marketplace, Chemdex, in early 1987.

____ 9. Businesses make a distinction between direct and indirect materials.

____ 10. Governments perform many functions for their stakeholders.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. ____ activities include managing the inbound movements of materials and supplies and the outbound movements of finished goods and services.
   a. Procurement   c. Transaction
   b. Logistics   d. Production

____ 12. The roots of web technology for B2B transactions lie in a very hierarchically structured approach to interfirm information transfer called ____.
   a. client/server   c. Object technology
   b. TCP/IP   d. electronic data interchange

____ 13. Firms that exchange data in specific standard formats are said to be ____.
   a. standard codes   c. common
   b. EDI compatible   d. protocol

____ 14. In 1979, ANSI chartered a new committee to develop uniform EDI standards. This committee is called the ____.
   a. ASC X12   c. IEEE 2321
   b. ACM X15   d. ASE A23

_____15. A(n) _____ is a company that provides communications equipment, software, and skills needed to receive, store, and forward electronic messages that contain EDI transaction sets.
  a.   VAN   c.   API
  b.   EDI provider d.   LAN

_____ 16. _____ allows trading partners to pass messages through the VAN instead of connecting their computers directly to each other.
  a.   Indirect connection EDI   c.   Loop EDI
  b.   Direct connection EDI   d.   VAN EDI

_____ 17. The EDI transaction sets that provide instructions to a trading partner's bank are called _____.
  a.   BEDI   c.   XEDI
  b.   FEDI   d.   ACH

_____ 18. When companies integrate their supply management and logistics activities across multiple participants in a particular product's supply chain, the job of managing that integration is called _____.
  a.   supply chain management   c.   enterprise resource planning
  b.   procurement management   d.   total quality management

_____ 19. The major issue that most companies must deal with in forming supply chain alliances is developing _____.
  a.   standard procedures   c.   network relationships
  b.   open communication channels   d.   trust

_____ 20. In 1968, a number of freight and shipping companies joined together to form the _____, which was charged with exploring ways to reduce the paperwork burden that shippers and carriers faced.
  a.   TDCC   c.   ANSI
  b.   EDI   d.   ASC X12

Essay questions

21. What are purchasing activities and how are they different from procurement?

22. What is the difference between an indirect connection and a direct connection?

23. What are the advantages of using internet technologies in supply chain management?

24. What is the difference between direct and indirect materials?

25. What are the advantages of using a value-added network?

Chapter 6

6 Online auctions, virtual communities, and web portals

Introduction

Until now, you have been learning about how the new technologies of the internet have benefited areas of business that were well established in traditional business models: creating company identities, targeting and reaching consumers, and conducting business with consumers. Additionally, you have learned how web technologies enable businesses to manage their own activities, such as purchase goods and supplies, and manage these supplies more efficiently. This chapter marks a shift into how the web enables businesses to achieve activities that are completely new to commerce. Such activities include running auctions, creating virtual communities, and operating web portals.

Student reading

It is strongly advised that you now read Chapter 6 of the recommended course text.

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Discuss the key characteristics of the six major auction types.
- Compare and contrast strategies for general and specific consumer WWW auction sites.
- Discuss the origins and key characteristics of the seven major auction types.
- Compare and contrast strategies for web auction sites and auction-related businesses.
- Discuss virtual communities and web portals.

Subject summary

Chapter overview

Internet technology is extremely well-suited to facilitate online auctions for businesses. Auction sites can charge both buyers and sellers to participate, and it can sell advertising on its pages. People interested in trading specific items can form a market segment that advertisers will pay extra to reach. In the same way that search engines produce results pages which create particular markets to whom advertisers can target their products and services, auction sites also provide a perfect opportunity for advertisers to find particular consumers. This combination of revenue-generating characteristics makes it relatively easy to develop online auctions that yield profits early in the life of the project.

Although web auctions are a new success story in the financial world, as a business model auctions have obviously been generating revenue for thousands of years! The earliest forms of auctions were in Babylon at around 500 BC. The entire Roman empire was auctioned in 193 AD, after the death of Emperor Perinatx. The most famous auction houses in the world, Sotheby's and Christie's, began trading in the 17th Century. This chapter outlines differing approaches to establishing WWW based

actions and details several WWW auction strategies. It also describes the notion of virtual community and explains how WWW portals may be used to attract online consumers.

Origins of auctions

Although the auction process varies according to its type (see below), all auctions are established under the same conditions: a seller offers an item or items for sale, but does not assign a price to the item. This is called "putting an item up for bid" or "putting an item on the (auction) block." Potential buyers are given information about the item or some opportunity to examine it; they then offer bids, which are the prices they are willing to pay for the item. The potential buyers, or bidders, each have developed private valuations, or amounts they are willing to pay for the item. The whole auction process is managed by an auctioneer. In some auctions, people employed by the seller or the auctioneer can make bids on behalf of the seller. These people are called *shill bidders*. Shill bidders can artificially inflate the price of an item and may be prohibited from bidding by the rules of a particular auction.

Types of auction

The *English auction* is the most well known of all of the auction types. Bidders publicly announce their successive higher bids until no higher bid is forthcoming. At that point, the auctioneer pronounces the item sold to the highest bidder at that bidder's price. This type of auction is also called an ascending-price auction. A minimum price may be used to set the price at which the auction will begin. A reserve price may also be set, which is the minimum price the seller will accept. An English auction is sometimes called an open auction (or open-outcry auction) because the bids are publicly announced; however, there are other types of auctions that use publicly announced bids that are also called open auctions.

A variation of an English auction is a *Yankee auction*, which is an English auction that offers multiple units of an item for sale and allows bidders to specify the quantity they want to buy. When the bidding concludes in a Yankee auction, the highest bidder is allotted the quantity he or she bid for. If items remain unsold after satisfying the highest bidder, those remaining items are allocated successively to the next-highest bidder(s) until all items are distributed.

In addition to English and Yankee auctions, the other types of auctions are:

- Dutch auctions: A form of open auction in which bidding starts at a high price and drops until a bidder accepts the price. Because the price drops until a bidder claims the item, Dutch auctions are also called descending-price auctions.
- First-Price Sealed-Bid Auctions: In sealed-bid auctions, bidders submit their bids independently and are usually prohibited from sharing information with each other. In a first-price sealed-bid auction, the highest bidder gets the item.
- Second-price sealed-bid auction: The same as the first-price sealed-bid auction except that the highest bidder is awarded the item at the price bid by the second-highest bidder.
- Open-outcry double auctions: Buy and sell offers are shouted by traders standing in a small area on the exchange floor called a trading pit.
- Double auction: Buyers and sellers each submit combined price-quantity bids to an auctioneer. The auctioneer matches the sellers' offers (starting with the lowest price and then going up) to the buyers' offers (starting with the highest price and then going down) until all the items offered for sale are sold to buyers.
- Reverse auction: Multiple sellers submit price bids to an auctioneer who represents a single buyer. The bids are for a given amount of a specific item that the buyer wants to purchase. The prices go down as the bidding continues until no seller is willing to bid lower.

Online auctions and related businesses

Online auctions are one of the fastest growing segments of online business today. Millions of people buy and sell all types of goods on consumer auction sites each year. Although the online auction business is changing rapidly as it grows, three broad categories of auction websites have emerged: general consumer auctions, specialty consumer auctions, and business-to-business auctions.

General consumer auctions

EBay is the most successful consumer auction website. Although it does offer different ways of buying and selling, the most common format used is a computerized version of the English auction. However, on eBay English auction sellers are allowed to set a reserve price. In this type of auction, bidders are listed, but the bid amounts are not disclosed until after the auction is over. This is a slight variation on the in-person English auction, but because eBay always shows a continually updated high bid amount, a bidder who monitors the auction can see the bidding pattern as it occurs. The main difference between eBay and a live English auction is that bidders do not know who placed which bid until the auction is over. The eBay English auction also allows sellers to specify that an auction be made private. In an eBay private auction, the site never discloses bidders' identities and the prices they bid. At the conclusion of the auction, eBay notifies only the seller and the highest bidder. Another auction type offered by eBay is an increasing-price format for multiple-item auctions that eBay calls a Dutch auction. This format is not a true Dutch auction, but is instead a Yankee auction.

In either type of eBay auction, bidders must constantly monitor the bidding activity. All eBay auctions have a minimum bid increment, the amount by which one bid must exceed the previous bid, which is about 3 percent of the bid amount. To make bidding easier, eBay allows bidders to make a proxy bid. In a proxy bid, the bidder specifies a maximum bid. If that maximum bid exceeds the current bid, the eBay site automatically enters a bid that is one minimum bid increment higher than the current bid. As new bidders enter the auction, the eBay site software continually enters higher bids for all bidders who placed proxy bids until their maximum bid is reached or exceeded. Although this feature is designed to make bidding require less bidder attention, if a number of bidders enter proxy bids on one item, the bidding rises rapidly to the highest proxy bid offered. Most sellers specify a time and date after which the highest bidder will have bought the item. This rapid rise in the current bid often occurs in the closing hours of an eBay auction.

Learning activity

EBay has recently been fined for allowing the sale of fake designer goods on its auction website. It has also been in trouble for allowing the sale of concert tickets, which were originally sold for charity, at vastly inflated prices. Write a paragraph discussing who should be responsible for the items sold on an internet auction site. Is it the responsibility of the seller or the auctioneer to ensure that goods are genuine and as described? Is this different for internet auctions compared with traditional auctions where goods can be inspected?

Specialty consumer auctions

EBay has established itself so powerfully in the general consumer auction arena that no other company has launched a major attempt to rival it in the online market. Instead, a number of firms have decided to identify special-interest market targets and create specialized web auction sites that meet the needs of those market segments. Several early web auction sites started by featuring technology items such as computers, computer parts, photographic equipment, and consumer electronics.

Consumer reverse auctions and group purchasing sites

This is a new way of doing business made possible by internet technology. A group purchasing site is similar to a consumer reverse auction. On a group purchasing site, the seller posts an item with a price. As individual buyers enter bids on an item (these bids are agreements to buy one unit of that item, but no price is specified), the site can negotiate a better price with the item's provider. The posted price ultimately decreases as the number of bids increases, but only if the number of bids increases. Thus, a group purchasing site builds up a number of buyers who will force the seller to reduce its price. The effect is very much like the one achieved by a consumer reverse auction. The types of products that are ideal for group purchasing sites are branded products with well-established reputations. This allows

buyers to feel confident that they are getting a good bargain and are not trading off price for reduced quality. The products should also have a high value-to-size ratio and should not be perishable.

Business-to-business auctions

Many businesses at some point will have to decide what to do with their excess inventory. Excess inventory are items that may be either at the end of their product life cycle, or have not seen any sales or usage for a set period of time. If they are written off they can become a major loss to the company. Depending on its size, a firm typically uses one of two methods to distribute excess inventory. Large companies sometimes have liquidation specialists who find buyers for these unusable inventory items. Smaller businesses often sell their unusable and excess inventory to liquidation brokers, which are firms that find buyers for these items.

Online auctions are the logical extension of these inventory liquidation activities. The internet is a new and efficient channel with which to dispense with these items. B2B web auction models are simply the traditional excess inventory distribution activities outlined above transferred onto the web. In the large company model, the business creates its own auction site that sells excess inventory. In the small-company model, a third-party web auction site takes the place of the liquidation broker and auctions excess inventory listed on the site by a number of smaller sellers. The third business-to-business web auction model resembles consumer online auctions. In this model, a new business entity enters a market that lacked efficiency and creates a site at which buyers and sellers who have not historically done business with each other can participate in auctions. An alternative implementation of this model occurs when a web auction replaces an existing sales channel.

Business-to-business reverse auctions

In 2001, glass and building materials producer Owens Corning held more than 200 reverse auctions for a variety of items including chemicals (direct materials), conveyors (fixed assets), and pipe fittings (maintenance, repair and overhaul, or MRO). Owens Corning even held a reverse auction to buy bottled water. Asking its suppliers to bid has reduced the cost of those items by an average of 10 percent. Because Owens Corning buys billions of dollars worth of materials, fixed assets, and MRO items each year, the potential for cost savings is significant. Both the U.S. Navy and the federal government's General Services Administration are experimenting with reverse auctions to acquire a small part of the billions of dollars worth of materials and supplies they purchase each year. Companies that use reverse auctions include Agilent, BankOne, Bechtel, Boeing, Raytheon, and Sony.

However, not all companies are enthusiastic about reverse auctions. Some purchasing executives argue that reverse auctions cause suppliers to compete on price alone, which can lead suppliers to cut corners on quality or miss scheduled delivery dates. Others argue that reverse auctions can be useful for nonstrategic commodity items with established quality standards.

Auction-related services

Due to the success of online auctions, many businesses have taken the opportunity to offer services to enable auction participants. These include:

- **Auction escrow services:** An independent party that holds a buyer's payment until the buyer receives the purchased item and is satisfied that the item is what the seller represented it to be.
- **Auction directory and information services:** Offer guidance for new auction participants and helpful hints and tips for more experienced buyers and sellers along with directories of online auction sites.
- **Auction software:** For sellers, these companies offer software and services that can help with or automate tasks such as image hosting, advertising, page design, bulk repeatable listings, feedback tracking and management, report tracking, and email management. For buyers, a number of companies sell auction sniping software. Sniping software observes auction progress until the last second or two of the auction clock. Just as the auction is about to expire, the sniping software places a bid high enough to win the auction.

- **Auction consignment services:** Take an item and create an online auction for that item, handle the transaction, and remit the balance of the proceeds after deducting a fee that ranges from 10 percent to 40 percent of the selling price obtained. Items that do not sell are returned or donated to charity.

Virtual communities and web portals

As you have learned, the internet reduces transaction costs in value chains and offers an efficient means of communication to anyone with an internet connection. Combining the internet's transaction cost reduction potential with its role as a facilitator of communication among people, companies have developed two other new approaches to making money on the internet and the web: virtual communities and web portals.

A virtual community is a gathering place for people and businesses that only exist on the WWW. It has no physical existence. These virtual communities help businesses and their consumers and suppliers plan, collaborate, transact and interact in ways that benefits all of them. Most WWW communities are business-to-consumer strategy implementations; however some business-to-business communities such as Milpro have emerged.

A business can maintain contact and goodwill with its consumers, even perhaps a sense of belonging by organising a virtual community such as a chat room, newsgroup or bulletin board. Interaction with potential consumers will focus the company's product and services where the consumer needs it. Online branding could be supported or enhanced by virtual community interactions.

The internet has enabled the creation of many new communication practices, often in collaboration with the use of other types of new technology:

- **Mobile communications technology:** Wireless Application Protocol (WAP) allows web pages formatted in HTML to be displayed on devices with small screens, such as PDAs and mobile phones. As mobile technology improves, more and more devices will become web-enabled and will include other features that will open doors to a second wave of electronic commerce.
- **Mobile Business:** Most industry observers agree that revenue models for mobile business can be developed once mobile phones, notebook computers with wireless internet connections, and online marketplaces are interconnected in ways that let people switch among modes of access seamlessly.
- **Intelligent software agents:** Programs that search the web and find items for sale that meet a buyer's specifications.
- **Virtual communities:** A gathering place for people and businesses that does not have a physical existence. Exist on the internet today in various forms, including Usenet newsgroups, chat rooms, and websites. These communities offer people a way to connect with each other and discuss common issues and interests.

Early web communities

One of the first web communities was the WELL. The WELL, which is an acronym for "whole earth 'lectronic link," predates the web. It began as a series of dialogs among the authors and readers of the *Whole Earth Review* in 1985. Most WELL members were originally from the San Francisco Bay area, and the influence of that area's counterculture heritage is a significant part of the WELL's ambiance. Members of the WELL pay a monthly fee to participate in its forums and conferences. The WELL has been home to many important researchers and participants in the growth of the internet and the web.

Web community consolidation

Virtual communities for consumers can succeed as money-making propositions if they offer something sufficiently valuable to justify a charge for membership. For example, people joining the WELL community obtain access to a very interesting set of existing members who frequent the WELL's

discussion areas. These areas are open only to members. Thus, WELL owner *Salon.com* can charge a subscription fee for access to the WELL community.

Web communities in the second wave of electronic commerce

In the early days of the internet, virtual communities were an essential part of the online experience for the small number of people who regularly used the medium. As the internet and web grew, some of these communities grew, but others found that their purpose as a place for sharing the new experiences of online communication began to fade. In the second wave of electronic commerce, a new phenomenon in online communication began. People who were now using the internet no longer found a common bond in the fact that they were using the internet. Multiple common bonds joined people with all types of common interests. The internet was no longer the focus of the community, but was simply a tool that enabled communication among members of the community. It is this shift that has been of interest to other businesses.

Revenue models for web portals and virtual communities

By the late 1990s, virtual communities were selling advertising to generate revenue. Search engine sites and web directories were also selling advertising to generate revenue. Beginning in 1998, a wave of purchases and mergers occurred among these sites. The new sites that emerged still used an advertising-only revenue generation model and included all the features offered by virtual community sites, search engine sites, web directories, and other information-providing and entertainment sites.

Web portal revenue models

- **Advertising-supported web portals:** Some web observers believe that web portal sites could be the great revenue-generating businesses of the future. They argue that adding portal features to existing sites or converting sites to portals can be a wise business strategy. They believe that combining web communities' sense of belonging with search engine and web directory tools will yield websites with high degrees of stickiness that will be extremely attractive to advertisers.
- **Mixed-revenue web portals and virtual communities:** One of the of the most successful web portals is Time Warner's AOL unit, which has always charged a fee to its users and has always run advertising on its site. Many web portals that have struggled with their advertising-supported revenue models have been moving toward AOL's strategy.
- **Internal web portals:** A growing number of large organizations have built web portals to provide information to their employees. These portals can save significant amounts of money by replacing the printing and distribution of paper memos, newsletters, and other correspondence with a website. Organizations use internal web portals to publish employee handbooks, newsletters, and employee benefits information. These organizations are also finding that the internal portal website can become a good way of creating a virtual community among employees who are dispersed over a wide geographic area.

Stickiness

Stickiness is the ability of a website to keep visitors at its site and to attract repeat visitors. Interactions with a virtual community can create this valuable, intangible asset called stickiness and many advertisers will pay up front to advertise on a populated sticky website. WWW portals have been increasingly able to obtain these upfront cash payments from advertisers eager to exploit the high degree of stickiness associated with certain WWW portals. In addition, WWW portals ask their consumers to provide demographic information about themselves, which gives them a good potential for target marketing, and a range of other online services such as referrals.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. In a double auction, buyers and sellers each submit combined price-quantity bids to an auctioneer.

____ 2. Double auctions can be operated in sealed-bid format only.

____ 3. The most successful consumer auction website today (by far) is eBay.

____ 4. Dutch auctions are particularly good for moving small numbers of commodity items quickly.

____ 5. The largest number of online auctions occurs on general business auction sites.

____ 6. Analysts believe that a more appropriate term for the electronic commerce that occurs in general consumer auctions is consumer-to-consumer.

____ 7. Large companies, such as Ingram Micro, are removing the liquidation brokers from the value chain and claiming the broker's intermediary profits. This process is called disintermediation.

____ 8. Sniping software observes auction progress until the last second or two of the auction clock.

____ 9. Intelligent software agents are programs that search the web and find items for sale that meet a buyer's specifications.

____ 10. Because sniping software synchronizes its internal clock to the auction site clock and executes its bid with a computers precision, the software almost always wins out over a human bidder.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. In some auctions, ____, employed by the seller or the auctioneer, can make bids on behalf of the seller.
   a.   auction agents   c.   shill bidders
   b.   bidders   d.   auction dealer

____ 12. Second-price sealed-bid auctions are commonly called ____.
   a.   open outcry auctions   c.   double auctions
   b.   Vickrey auctions   d.   Victory auctions

_____ 13. The most common format used on eBay is a computerized version of the _____ auction.
   a.   Dutch   c.   English
   b.   sealed-bid   d.   U.S.

_____ 14. A(n) _____ is the amount by which one bid must exceed the previous bid.
   a.   minimum bid increment   c.   security bid
   b.   deposit bid   d.   maximum bid increment

_____ 15. One of the aggressive marketing tactics that _____ used to promote its auction business was its "Auctions Guarantee."
   a.   eBay   c.   Excite
   b.   Yahoo! d.   Amazon

_____ 16. Farmers' cooperatives in the Netherlands use _____ to sell perishable goods, such as produce and flowers.
   a.   English auctions c.   double auctions
   b.   Dutch auctions   d.   sealed-bid auctions

_____ 17. The earliest auctions for which we have written records are from Babylon in about _____ B.C.
   a.   100   c.   2000
   b.   500   d.   6000

_____ 18. An auction in which bidders publicly announce their successive higher bids until no higher bid is forthcoming is called a(n) _____ auction.
   a.   Yankee   c.   Dutch
   b.   ascending-price d.   Double

_____ 19. _____ can artificially inflate the price of an item and may be prohibited from bidding by the rules of a particular auction.
   a.   Auctioneers c.   Liquidation brokers
   b.   Snipers   d.   Shill bidders

_____ 20. The act of placing a winning bid at the last second is called a(n) _____.
   a.   shill   c.   snipe
   b.   proxy   d.   lock-in

Essay questions

21.   What is the difference between an English auction and a Dutch auction?

22.   Describe the operation of a typical auction.

23.   List the supply chain characteristics that support reverse auctions.

24.   What is the main difference between eBay and a live English auction?

25.   How does a proxy bid work on eBay?

Chapter 7

7 The environment of electronic commerce: legal, ethical, and tax issues

Introduction

Everything you have learned so far about conducting commerce on the web is subject to legislation and ethical consideration. These aspects vary from country to country, and as the technology and use of the internet develops, so do the forces which control it. Thus, in this chapter, you will learn about the international governing aspects of e-commerce. You will be provided with an overview of issues regarding borders, jurisdiction, and website content and how these factors affect a company's ability to conduct electronic commerce. You will also learn about legal issues that arise when the web is used in the commission of crimes, terrorist acts, and even the conduct of war. You will learn about the laws that govern e-commerce activities and the ethical issues that arise when companies conduct e-commerce. This chapter also addresses the tax implications of conducting e-commerce.

Student reading

It is strongly advised that you now read Chapter 7 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Describe the laws that govern electronic commerce activities.
- Describe the laws that govern the use of intellectual property by online businesses.
- Outline the various aspects of online crime, terrorism, and warfare.
- Compare and contrast ethics issues that arise for companies conducting electronic commerce.
- Discuss conflicts between companies' desire to collect and use data about their consumers and the privacy rights of those consumers.
- Discuss the taxes that are levied on electronic commerce activities.

Subject summary

Chapter overview

When a company uses the web to create a corporate image, build a brand, sell or purchase products or services, conduct auctions, or build a community, they are automatically operating in an international market. Establishing cultural ties and building credibility is essential in the global environment. However, language, culture, infrastructure, legal, political and tax issues, pose some formidable barriers to successful international electronic commerce activities.

Businesses that operate on the web must comply with the same laws and regulations that govern the operations of all businesses. If they do not, they face the same set of penalties—fines, reparation payments, court-imposed dissolution, and even jail time for officers and owners—that any business faces.

The legal environment of electronic commerce

Businesses that operate on the web must comply with the same laws and regulations that govern the operations of all businesses. However, the nature of web technology means that many legal implications within traditional commerce cannot be directly applied to e-commerce. Businesses operating on the web face two additional complicating factors as they try to comply with the law. First, the web extends a company's reach beyond traditional boundaries. Therefore a web-based business automatically takes on an international perspective, which suggests that their operations are governed by the various laws and regulations of the host state(s) Thus, a company can become subject to many more laws more quickly than a traditional brick-and-mortar business based in one specific physical location. Second, the web increases the speed and efficiency of business communications. Further, the web creates a network of consumers who often have significant levels of interaction and complex relationships with each other. Web businesses that violate the law or breach ethical standards can face rapid and intense reactions from many consumers and other stakeholders who become aware of the businesses' activities.

In the physical world, geographical boundaries usually coincide with legal and cultural boundaries. A traveller entering another country would probably notice some formal custom procedure for legal entry as well as a different culture, language currency and customs. The legal environment between geographical and legal boundaries can be described in terms of power, effects, legitimacy and notice.

Power is the physical control over territory and people, which define a sovereign government as a jurisdiction. Effects are concerned with the willingness of local authorities to accept various consequences of a person's or firm's behaviour. We can use gambling as an illustrative example. The effects of legalized gambling are acceptable to certain localities in our country, and not to other communities. Legitimacy involves the input and consent of the governed to participate in the creation of their own legal environment. Finally, the concept of notice involves apprising a person that a particular set of laws is in effect. Physical and legal boundaries usually do this very effectively. For instance, when driving through different areas, states, or countries, the speed limit will be clearly displayed according to local consideration and need. Drivers will see these signs and are expected to act accordingly.

Borders and jurisdiction

Territorial borders in the physical world serve a useful purpose in traditional commerce: They mark the range of culture and reach of applicable laws very clearly. When people travel across international borders, they are made aware of the transition in many ways.
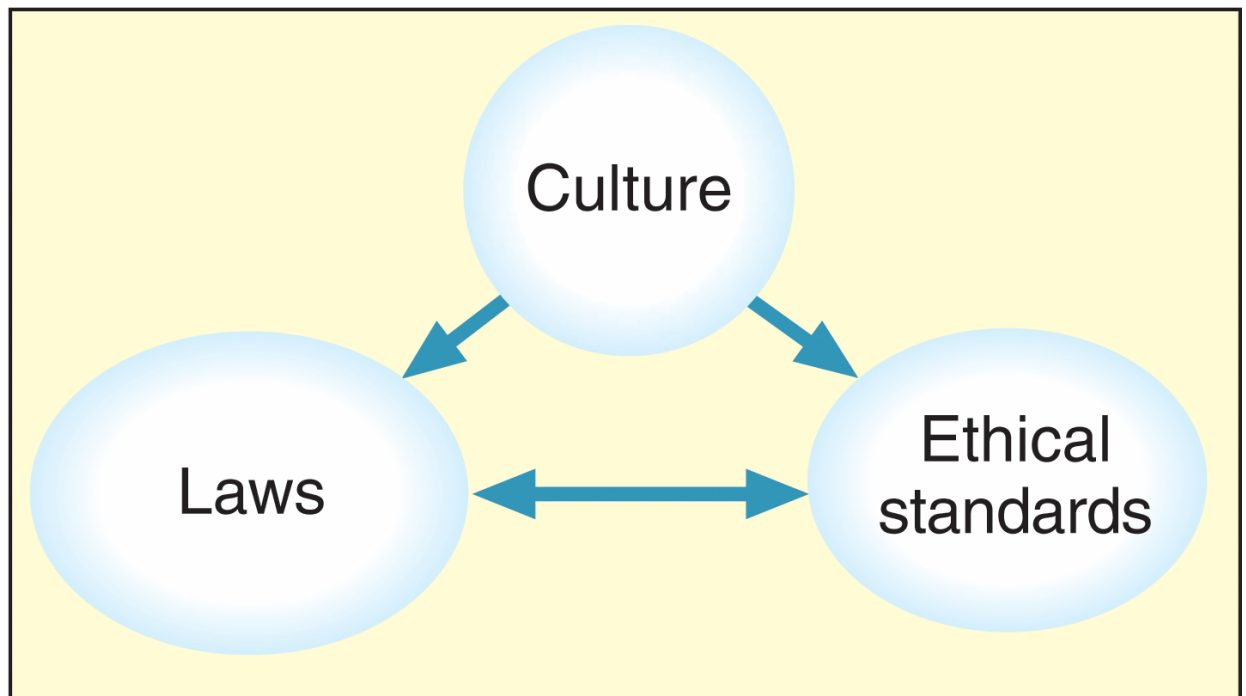
Culture helps determine laws and ethical standards

(Schneider 2007: p.312)

- **Power:** A form of control over physical space and the people and objects that reside in that space; a defining characteristic of statehood. For laws to be effective, a government must be able to enforce them. The ability of a government to exert control over a person or corporation is called jurisdiction.
- **Effects:** Laws in the physical world are grounded in the relationship between physical proximity and the effects, or impact, of a person's behaviour. Personal or corporate actions have stronger effects on people and things that are nearby than on those that are far away.
- **Legitimacy:** The idea that those subject to laws should have some role in formulating them.
- **Notice:** Physical boundaries are a convenient and effective way to announce the ending of one legal or cultural system and the beginning of another. The physical boundary, when crossed, provides notice that one set of rules has been replaced by a different set of rules. Notice is the expression of such a change in rules.

Jurisdiction on the internet

Establishing jurisdiction in the virtual world of the internet is much more complicated because legal processes, which have evolved over centuries, are predicated upon physical boundaries and physical existence. The rapid growth of the web has not been matched with a commensurate evolution of legal principles to enforce business contracts, or regulation or torts, etc. Even if legal scholars were capable of "catching up", the entire electronic commerce industry is evolving so rapidly that law would still lag behind business practices at least until the industry matures. A court of law must have both subject-matter jurisdiction and personal jurisdiction to preside over a legal matter.

Governments that want to enforce laws regarding business conduct on the internet must establish jurisdiction over that conduct. A contract is a promise or set of promises between two or more legal entities - persons or corporations - that provides for an exchange of value (goods, services, or money) between or among them. A tort is an intentional or negligent action taken by a legal entity that causes harm to another legal entity. People or corporations that wish to enforce their rights based on either contract or tort law must file their claims in courts with jurisdiction to hear their cases. A court has sufficient jurisdiction in a matter if it has both subject matter jurisdiction and personal jurisdiction.

Learning activity

Suppose a person in one country develops a website which is hosted by a company based in a second country, which contains material which is illegal in a third country. Who do you think should be responsible for policing this matter?

Subject-matter jurisdiction

Subject-matter jurisdiction refers to a court's authority to rule in a particular dispute. Admiralty, bankruptcy, patents, and federal taxation can only be tried in U.S. and specialty courts, while most civil and criminal matters are heard in state courts. Contracts, torts and business disputes may be in the jurisdiction of either court system, or perhaps some international forum such as the world court. Personal jurisdiction or venue usually refers to the residency of the defendant in a civil matter.

The content of a website raises legal issues of intellectual property, trademark infringements, deceptive trade and advertising practices and perhaps decency standards. In the United States, the Federal Court Commission (FTC) has regulatory authority to a greater extent over these issues although other regulatory agencies also have some jurisdiction.

The FTC in general, has oversight responsibilities for advertising in the following areas:
- Bait advertising
- Consumer lending and leasing
- Endorsement and testimonials
- Energy consumption statements for home appliances
- Guarantees and warranties
- Prices

Ethical issues in electronic commerce

Any e-commerce business must be aware that any ethical issues transgressed on the web can be brought to justice in a court of law. These ethical issues include: defamation – causing injury to another party's character; product disparagement – denigrating another party's merchandise; privacy rights; and protection of personal data.

Conflict of laws

The United States is an example of a group of states within a continent which can lead to a conflict of laws in the legal arena. This is because business is governed by federal laws, state laws, and local laws in the U.S. Sometimes, these laws address the same issues in different ways. Lawyers call this situation a conflict of laws. Online businesses usually serve broad markets that span many localities and many states, therefore they generally look to federal laws for guidance. On occasion, this can lead to problems with state and local laws.

Contracting and contract enforcement in electronic commerce

A legal business transaction is determined by a contract, and any contract includes three essential elements: an offer, an acceptance, and consideration. The contract is formed when one party accepts the offer of another party. An offer is a commitment with certain terms made to another party, such as a declaration of willingness to buy or sell a product or service. An offer can be revoked as long as no payment, delivery of service, or other consideration has been accepted. An acceptance is the expression of willingness to take an offer, including all of its stated terms. Consideration is the agreed upon exchange of something valuable, such as money, property, or future services. When a party accepts an offer based on the exchange of valuable goods or services, a contract has been created. It is important to remember, however, that in some circumstances, a physical contract does not have to be produced for contract conditions to legally apply. An implied contract can also be formed by two or more parties that act as if a contract exists, even if no contract has been written and signed.

Contract enforcement in electronic commerce:

Contracts appear in various ways on the web. These include:

- **Written contracts on the web:** In general, contracts are valid even if they are not in writing or signed. However, certain categories of contracts are not enforceable unless the terms are put into writing and signed by both parties. Most courts will hold that a 'writing' exists when the terms of a contract have been reduced to some tangible form – since the 1800s, it has been legally upheld that a telegraph transmission was considered a writing, and since then the same has applied to tape recordings, computer files on disks, and faxes; thus, e-commerce is a natural extension of these technological legal precedents. A signature is any symbol executed or adopted for the purpose of authenticating a writing.
- **Warranties on the web:** Most firms conducting electronic commerce have little trouble fulfilling the requirements needed to create enforceable, legally binding contracts on the web. One area that deserves attention, however, is the issue of warranties. Any contract for the sale of goods includes implied warranties. Sellers can avoid some implied warranty liability by making a warranty disclaimer. A warranty disclaimer is a statement declaring that the seller will not honour some or all implied warranties.
- **Authority to form contracts:** Determining whether an individual has the authority to commit a company to an online contract can be a problem in electronic commerce. This issue, called authority to bind, can arise when an employee of a company accepts a contract and the company later asserts that the employee did not have such authority.
- **Terms of service agreement:** These are intended to limit the website owner's liability for anything a site visitor might do with information obtained from the site. In most cases, a site visitor is held to the terms of service even if that visitor has not read the text or clicked a button to indicate agreement with the terms.

Use and protection of intellectual property in online business

The concept of intellectual property is becoming increasingly important – and complex – in a parallel vein to e-commerce itself. As industries, particularly in the U.S. and Europe, shift from being manufacturing producers to intellectual property producers, the legal sphere is adapting to protect the creators of this new type of output. Online businesses must be careful in their use of intellectual property. Intellectual property is a general term that includes all products of the human mind. These products can be tangible or intangible. Intellectual property rights include the protections afforded to individuals and companies by governments through governments' granting of copyrights and patents, and through registration of trademarks and service marks. Online businesses must take care to avoid deceptive trade practices, making false advertising claims, engaging in defamation or product disparagement, and violations of intellectual property rights by using unauthorized content on their websites or in their domain names.

Website content issues

Legal issues regarding the content of web pages include:

- **Copyright infringement:** A copyright is a right granted by a government to the author or creator of a literary or artistic work. Note that an entity becomes liable for vicarious copyright infringement if it is capable of supervising the infringing activity and obtains a financial benefit from the infringing activity.
- **Patent infringement:** A patent is an exclusive right granted by the government to an individual to make, use, and sell an invention. In the United States, patents on inventions protect the inventor's rights for 20 years. A patent on the design for an invention provides protection for 14 years. To be patentable, an invention must be genuine, novel, useful, and not obvious given the current state of technology.
- **Trademark infringement:** A trademark is a distinctive mark, device, motto, or implement that a company affixes to the goods it produces for identification purposes. A service mark is similar to a trademark, but it is used to identify services provided. Note that the name that a business uses to identify itself is called a trade name.

Domain names, cybersquatting, and name stealing

As both e-commerce and intellectual property issues are in relatively early stages of establishing themselves and their practices, many companies found themselves having to cope with others who tried to make a profit from new web technologies and intellectual property loopholes. This led to significant amounts of contention regarding intellectual property rights and internet domain names. *Cybersquatting* is the practice of registering a domain name that is the trademark of another person or company in the hopes that the owner will pay huge amounts of money to acquire the URL. In addition, successful cybersquatters can attract many site visitors and, consequently, charge high advertising rates. A related problem, called name changing, occurs when someone registers purposely misspelled variations of well-known domain names. These variants sometimes lure consumers who make typographical errors when entering a URL. Name stealing occurs when someone posing as a site's administrator changes the ownership of the site's assigned domain name to another site and owner.

Protecting intellectual property online

Many people have tried to devise ways of protecting intellectual property online. Several industry trade groups have proposed solutions to the current problems in digital copyright protection, including host name blocking, packet filtering, and proxy servers. All three approaches illustrate how an internet service provider might try to block access to an entire offending site. However, none of these approaches are really effective in preventing theft or providing identification of property obtained without the copyright holder's permission.

Defamation

Defamation is a tricky legal area, and different jurisdictions deal with it in different ways. For instance, in some countries an advertiser is permitted to compare their product or service with a rival; in others this is never allowed; in some only under certain conditions. As you have learned, transferring laws from the physical world to the online world is a risky business, so e-businesses need to remain careful in these matters. A defamatory statement is a statement that is false and that injures the reputation of another person or company. If the statement injures the reputation of a product or service instead of a person, it is called product disparagement. In some countries, even a true and honest comparison of products may give rise to product disparagement. Because the difference between justifiable criticism and defamation can be hard to determine, commercial websites should avoid making negative, evaluative statements about other persons or products.

Deceptive trade practices

You have learned that businesses spend a lot of time and resources creating and maintaining their brands and reputations surrounding their products and services. Therefore they want to guard against a consumer confusing their product with someone else's, especially if it is considered a product of lower quality, as this would potentially weaken their brand. Thus, trademark protection exists to guard against a potential buyer confusing one product for another. It prevents another firm from using the same or a similar name, logo, or other identifying characteristic in a way that would cause confusion in the minds of potential buyers of the trademark holder's products or services. For example, the trademarked name "Visa" is used by one company for its credit card services and another company for its type of synthetic fibre. This use is acceptable because the two products are significantly different. However, the use of very well-known trademarks can be protected for all products if there is a danger that the trademark might be diluted. Various state laws define trademark dilution as the reduction of the distinctive quality of a trademark by alternative uses. Trademarked names such as "Hyatt," "Trivial Pursuit," and "Tiffany," and the shape of the Coca-Cola bottle have all been protected from dilution by court rulings. A website that sells gift-packaged seafood and claims to be the "Tiffany of the Sea" risks a lawsuit from the famous jeweller claiming trademark dilution.

Ethics and web business policies

An important ethical issue that organizations face when they collect e-mail addresses from site visitors is how the organization limits the use of the e-mail addresses and related information. In the early days of the web, few organizations made any promises to visitors who provided such information. Today, most organizations state their policy on the protection of visitor information, but many do not. In the United States, organizations are not legally bound to limit their use of information collected through their websites. They may use the information for any purpose, including the sale of that information to other organizations. This lack of government regulation that might protect site visitor information is a source of concern for many individuals and privacy rights advocates. These concerns are discussed in the next section.

Privacy rights and obligations

The issue of online privacy is continuing to evolve as the internet and the web grow in importance as tools of communication and commerce. Many legal and privacy issues remain unsettled and are hotly debated in various forums. The Electronic Communications Privacy Act of 1986 is the main law governing privacy on the internet today. Of course, this law was enacted before the general public began its wide use of the internet.

Ethics issues are significant in the area of online privacy because laws have not kept pace with the growth of the internet and the web. The nature and degree of personal information that websites can record when collecting information about visitors' page-viewing habits, product selections, and demographic information can threaten the privacy rights of those visitors.

Principles for handling consumer data include:

- Do use the data collected to provide improved consumer service.
- Do not share consumer data with others outside your company without the consumer's permission.
- Do tell consumers what data you are collecting and what you are doing with it.
- Do give consumers the right to demand that you delete any of the data you have collected about them.

Taxation and electronic commerce

Taxation regulations vary according to jurisdiction. Therefore the usual obstacles apply when thinking about taxation online. The United States has had experience of trying to apply taxation regulation to online businesses. Any income-generating website based in the U.S. is subject to federal income tax and perhaps state income taxes, although a deduction for taxes paid to a foreign government is frequently allowable. Businesses that establish a nexus with a state must report the sales taxes, which they collect from their consumers. The tax administrative procedures of oversight, collection and enforcement represent a difficult problem for the taxing entities. Although an internet transaction tax has been proposed in Congress, the current Congressional position on this matter is that such a tax would retard the development of electronic commerce and put U.S. businesses at a competitive disadvantage.

Online crime, terrorism and warfare

Internet technologies have allowed people and organisations to improve their ability to exchange ideas across the world with ease, where previously physical distances have hampered their ability to communicate. This improved ability to communicate is generally a good thing, however the technology also enables those wishing to perpetrate crimes, conduct terrorism, and even wage war.

Although the internet was designed from its inception to continue operating while under attack, a sustained effort by a well-financed terrorist group or rogue state could slow down the operation of major transaction-processing centres. As the technology becomes increasingly indispensable for conducting business and government services, the potential threat and any resulting accomplishment by those wishing to cause harm and distress also increases.

Online crime

You have learned that what happens online is sometimes a replica of what happens in the physical world, plus activities uniquely inspired by web technology. The same is true of criminal activity. For instance, theft, stalking, distribution of pornography, and gambling have been transferred onto the web. Other crimes are entirely new and exist solely because of web technology - such as commandeering one computer to launch attacks on other computers.

In combating online crime, it is not simply a matter of transferring law enforcement onto the web. This is often because of the issue of jurisdiction. Consider the case of a person living in Canada who uses the internet to commit a crime against a person in London. It is unclear which elements of the crime could establish sufficient contact with London to allow police there to proceed against a citizen of a foreign country. It is possible that the actions that are considered criminal under English law might not be considered so in Canada.

Another problem facing law enforcement officers is the difficulty of applying laws that were written before the internet became prevalent to criminal actions carried out on the internet. While new laws are being formulated there are many grey areas of legality where criminals are active. There are also voices that wish the internet to remain an area of free speech that is open and accessible to all, who are trying to prevent it from being overly controlled. Therefore, the nature of the internet - and its future - is currently at a very interesting point in history.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. The connection between a taxpaying entity and a government is called jurisdiction.

____ 2. Businesses that operate on the web must comply with the same laws and regulations that govern the operations of all businesses.

____ 3. It is not reasonable to assume that a symbol or code included in an electronic file would constitute a signature.

____ 4. The legal systems of most countries include a concept called constructive notice.

____ 5. A business cannot commit a tortious act by selling a product that causes harm to a buyer.

____ 6. In general, trademark protection prevents another firm from using the same or a similar name, logo, or other identifying characteristics in a way that would cause confusion in the minds of potential buyers.

____ 7. Physical boundaries are a convenient and effective way to announce the ending of one legal or cultural system and the beginning of another.

____ 8. Most states' use tax rates are identical to their sales tax rates.

____ 9. Creations that can be copyrighted include virtually all forms of artistic or intellectual expression.

____ 10. A copyright on the design for an invention provides protection for 14 years.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. The characteristics of laws are determined by the local culture's acceptance of or rejection of various kinds of ____.
a.   efforts   c.   cultures
b.   effects   d.   customs

____ 12. ____ is the idea that those subject to laws should have some role in formulating them.
a.   Jurisdiction   c.   Legitimacy
b.   Effect   d.   Law

____ 13. The physical boundary, when crossed, provides ____ that one set of rules has been replaced by a different set of rules.
a.   effect   c.   notice
b.   power   d.   legitimacy

____ 14.____ is, in general, determined by the residence of the parties.
    a.   Jurisdiction   c.   Personal jurisdiction
    b.   Subject-matter jurisdiction   d.   Forum selection

____ 15. Most courts will hold that a(n) ____ exists when the terms of a contract have been reduced to some tangible form.
    a.   writing c.   agreement
    b.   file   d.   term

____ 16. Various state laws define ____ as the reduction of the distinctive quality of a trademark by alternative uses.
    a.   trademark distinction   c.   trademark binding
    b.   trademark dilution   d.   name changing

____ 17. A(n) ____ can be formed by two or more parties that act as if a contract exists, even if no contract has been written and signed.
    a.   offer   c.   consideration
    b.   implied contract d.   contract

____ 18. Disputes that arise when one person has registered a domain name that is an existing trademark or company name are settled by the ____.
    a.   WIPO   c.   statutory law
    b.   common law   d.   ACPA

____ 19. In a(n) ____ policy approach, the company that collects personal information in the course of doing business on the web does not use the information for any other purpose unless the consumer specifically chooses to allow that use.
    a.   opt-out   c.   fair use
    b.   implied   d.   opt-in

____ 20. If a company undertakes sufficient activities in a particular country, it establishes ____ with that country and becomes liable for filing tax returns in that country.
    a.   copy control   c.   ToS
    b.   notice   d.   nexus

Essay questions

21. What is the difference between a contract and a tort?

22. Mark Van Name and Bill Catchings, writing in PC Week in 1998, outlined four principles for handling consumer data. List these principles.

23. If a consumer buys a product at the supermarket, what are the elements of that contract?

24. What is the difference between subject-matter jurisdiction and personal jurisdiction?

25. What elements of a valid contract are met when shopping at a department store?

Chapter 8

8 Web server hardware and software

Introduction

After an e-business has decided what it will trade, and who it will target, the equipment it needs to accomplish its goals is the next requirement to be considered. In this chapter, you will learn the background information on the basic technologies used to build websites that can support online business operations. It includes a discussion of server software and hardware. It also includes an introduction to the software that these sites use to perform utility functions such as site maintenance, diagnostics, and e-mail management.

Student reading

It is strongly advised that you now read Chapter 8 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Outline and discuss web server basics.
- Critically analyse e-mail management and spam control issues.
- Describe and discuss software for web servers.
- Compare and contrast alternative approaches to creating an effective business presence on the web.
- Explain the main issues associated with internet and website utility programs.
- Discuss alternative web server hardware systems.

Subject summary

Chapter overview

This chapter provides an overview regarding the different types of hardware and software used to design, engineer and implement electronic commerce applications. By the end of this chapter, you should have a good understanding of web server hardware and feature sets with which to develop a successful electronic commerce application. You should also have a broad knowledge of the tools and performance evaluation criteria used to make decisions on how to best maintain and manage the application.

Web servers

Companies create websites for a wide variety of reasons and in a wide variety of formats. Each has a different purpose, requires different computer hardware and software, and requires different monetary and personnel resources.

The main job of a web server computer is to respond to requests from web client computers. The three main elements of a web server are the hardware (computers and related components), operating system software, and web server software. All three of these elements must work together to provide sufficient capacity in a given situation.

A company may invest in its own infrastructure for electronic commerce or to use an internet service provider (ISP). When assessing which is the best option for the company several key questions must be addressed. It is fundamental that an appraisal is made of what expectations both management and sales staff have with regard to the operation of the server. Key questions which must be asked are:

- What is the target audience that the company hopes will access the WWW server?
- Are transactions going to be taken via the WWW server and if so how many and how frequently?
- What is the level of staffing that will be required to maintain the WWW server on a daily basis?

Types of websites:

- Development sites
- Intranets
- Extranets
- Transaction-processing sites
- Content-delivery sites

When people use their internet connections to become part of the web, their computers become web client computers on a worldwide client/server network. Client/server architectures are used in LANs, WANs, and the web. In a client/server architecture, the client computers typically request services from the server, such as printing, information retrieval, and database access. The server then processes the clients' requests. The computers that perform the server function usually have more memory and larger, faster disk drives than the client computers they serve.

Choosing a web server

When choosing a WWW server there is a simple rule: faster WWW servers are generally more effective and efficient than slower WWW servers. If a company decides not to use an ISP then the choice of WWW server must be able to accommodate not only recognised demands but also future demands. Such demands will take the form of both external traffic via the internet and internal traffic via the company's intranet.

A second consideration that must be made is the choice of operating system. The two leading operating systems in the WWW server market place are Unix and MS Windows.

Yet another consideration when evaluating WWW server performance is the connection speed. This will ultimately be determined by the type of internet connection utilised. The performance of the internet connection is generally measured as throughput i.e. how many HTTP requests can be processed over a period of time. One should also note that the mix and type of WWW pages (dynamic, static, rich media, etc.) may also affect the overall performance of a WWW server.
Finally it should also be realised that a successful electronic commerce operation will require a scaleable solution, one in which all aspects of the WWW server can be upgraded as demand requires.

The classical way to evaluate hardware and software for WWW servers is to use benchmarking software. Such software can be used to determine which hardware and software combination most clearly meets the requirements laid down by the purchaser.

Web client/server communication

Here is an example of classic communication between a web client and a web server computer. A web browser is used to visit a company's website. The web browser – also called web client – requests files of information from the company's web server. Using the internet as the transportation medium, the request is formatted by the browser using HTTP and sent to the server computer. A moment later, when the server receives the request, it retrieves the file containing the web page or other information that the client requested, formats it using HTTP, and sends it back to the client over the internet.

Two-tier client/server architecture:

A typical request message from a client to a server consists of three major parts: request line, optional request headers, and an optional entity body.

Three-tier and n-tier client/server architectures:

A three-tier architecture extends the two-tier architecture to allow additional processing to occur before the web server responds to the web client's request. Higher-order architectures - that is, those that have more than three tiers - are usually called n-tier architectures.

Dynamic content

A dynamic page is a web page whose content is shaped by a program in response to user requests, whereas a static page is an unchanging page retrieved from disk. A server delivering mostly static web pages performs better than the same server delivering dynamic web pages because static page delivery requires less computing power than dynamic page delivery. The largest performance differences between competing web server products appear when servers deliver dynamic pages.

Dynamic content is nonstatic information constructed in response to a web client's request. For example, if a web client inquires about the status of an existing order by entering a unique customer number or order number into a form, the web server searches the customer information and generates a dynamic web page based on the customer information it found, thus fulfilling the client's request. Assembled from back-end databases and internal data on the website, a dynamic page is a specific response to the requester's query.

Software for web servers

Following on from outlining how a web server is used, we now move on to the software that operates web servers and other computers that a company might need to conduct e-commerce. This section considers the operating system software most commonly used on most web servers. It includes programs such as the web server software itself, internet utilities software, and e-mail software.

Operating systems for web servers

Most web servers run on computers that use one of the following operating systems: Microsoft Windows NT Server, Microsoft Windows 2000 or 2003 Server products, Linux, or one of several UNIX-based operating systems, such as Solaris or FreeBSD. Many companies believe that Microsoft server products are simpler for their information systems staff to learn and use, rather than UNIX-based systems. However, other companies worry about the security weaknesses caused by the tight integration between application software and the operating system in Microsoft products. UNIX based web servers are currently most popular, and many users believe that UNIX is a more secure operating system on which to run a web server.

Web server software

The most popular web server programs in use today are the Apache HTTP Server, Microsoft Internet Information Server (IIS), and Sun Java System Web Server (JSWS) (often called by its former names, Sun ONE, iPlanet Enterprise Server, and Netscape Enterprise Server). These popularity rankings were accumulated through surveys done by Netcraft, a networking consulting company in Bath, England, known throughout the world for its web server survey. Netcraft conducts continual surveys to tally the number of websites in existence and measure the relative popularity of internet web server software.

Apache HTTP server

This software has dominated the web since 1996 - because it is free, and it performs very efficiently. It is powerful enough that IBM includes it in its WebSphere application server package. Developed by Robert McCool in 1994 for the National Centre for Supercomputing Applications (NCSA) it has become the leading WWW server software package used for electronic commerce. **Apache HTTP server runs on many operating systems including Linux, MicroSoft NT and Sun's Solaris operating system.** Features of the Apache HTTP server include a password protection systems, digital certificate and authentication systems, and access restriction systems, all of which are considered to be particularly well implemented.

The Apache HTTP WWW server also provides excellent support for proprietary applications programming interfaces (APIs) and supports third party dynamic content generators such as MacroMedia's Coldfusion and Microsoft's Active server Pages.

Microsoft internet information server

This software comes packaged with current versions of Microsoft Windows Server operating systems. IIS is used on many corporate intranets because many companies have adopted Microsoft products as their standard products. Small sites running personal web pages use IIS, as do some of the largest electronic commerce sites on the web, but it is mostly considered suitable for small to medium sized electronic commerce operations. Particular features of note include its tight integration with Microsoft's network security management system and also its extensive support for Microsoft's programming languages. Microsoft's IIS also provides support for both SQL and ODBC. It is currently the most popular WWW server running on personal computers.

Sun Java system web server

Sun Java supports dynamic application development for server-side applications. Sun JSWS provides connectivity to a number of database products as well. JSWS is a powerful development environment, providing facilities for WWW publishing, link management and the uploading of WWW pages to host computers in an encrypted state. The JSWS also provides a powerful search engine which has the ability to index documents of many formats including Adobe PDF files Microsoft Word documents and PowerPoint documents. All of these can be converted directly into simple HTML. Particular features of note include the ability to add, delete and change user information remotely and a sophisticated password/challenge user and digital certificate authentication. The JSWS also provides excellent support for CGI and the JSWS API (NSAPI).

Learning activity

Write an answer to this question: Why would anyone pay for server software when Apache HTTP server software is free?

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Electronic mail (e-mail)

Electronic mail originated in the 1970s on the ARPANET. Although the goals of the ARPANET were to control weapons systems and transfer research files, general communications uses emerged on the network. In 1972, Ray Tomlinson, an ARPANET researcher, wrote a program that could send and receive messages over the network.

E-mail benefits

One useful feature of e-mail is that documents, pictures, movies, worksheets, or other information can be sent along with the message itself. These attachments are frequently the most important part of the message.

E-mail drawbacks

Despite its many benefits, e-mail does have some drawbacks. One annoyance associated with e-mail is the amount of time that businesspeople spend answering their e-mail today. A second major irritation brought by e-mail is the computer virus, more simply known as a virus, which is a program that attaches itself to another program and can cause damage when the host program is activated.

Spam

The sheer magnitude of the spam problem is hard to believe. During one 24-hour period in 2005, researchers estimated that 106 billion spam e-mail messages were sent. Many researchers who track the growth in spam believe that current trends will continue and that more than 90 percent of all e-mail messages (including messages transmitted to both business and personal users) will be spam before any effective technical solutions can be implemented. Other researchers believe that the growth of spam is showing signs of levelling out.

Solutions to the spam problem

One way individuals can limit spam is to reduce the likelihood that a spammer can automatically generate their e-mail addresses. Many organizations create e-mail addresses for their employees by combining elements of each employee's first and last names. For example, small companies often combine the first letter of an employee's first name with the entire last name to generate e-mail addresses for all employees at small companies (larger companies often use more complex algorithms as they are likely to have, for example, both a Jane Smith and a Judy Smith working for them). Any spam sender able to obtain an employee list can generate long lists of potential e-mail addresses using the names on the list. If no employee list is available, the spam sender can simply generate logical combinations of first initials and common names. The cost of sending e-mail is so low that a spammer can afford to send thousands of emails to randomly generated addresses in the hope that a few of them are valid. By using an e-mail address that is more complex, such as xq7yy23@mycompany.com, individuals can reduce the chances that a spammer can randomly generate his or her address. Of course, such an address is hard to remember, and this somewhat defeats the purpose of e-mail as a convenient way to communicate.

A second way to reduce spam is to control the exposure of an e-mail address. Spammers use software robots to search the internet for character strings that include the "@" character (which appears in every e-mail address). These robots search web pages, discussion boards, chat rooms, and any other online source that might contain e-mail addresses. Some individuals use multiple e-mail addresses to thwart spam. They use one address for display on a web site, another to register for access to web sites, another for shopping accounts, and so on. If a spammer starts using one of these addresses, the individual can stop using it and switch to another.

Web site and internet utility programs

In earlier chapters, you learned how companies are using e-mail as a key element in their electronic commerce strategies. In this section, you will learn some of the more significant technical details of how e-mail works.

Finger and ping utilities

Finger is a program that runs on UNIX operating systems and allows a user to obtain some information about other network users. A Finger command yields a list of users who are logged on to a network, or reports the last time a user logged on to the network. Many organizations have disabled the Finger command on their systems for privacy and security reasons.

A program called *Ping*, short for Packet Internet Groper, tests the connectivity between two computers connected to the internet. Ping provides performance data about the connection between internet computers, such as the number of computers (hops) between them. It sends two packets to the specified address and waits for a reply. Network technicians often use Ping to troubleshoot internet connections.

Tracert and other route-tracing programs

Tracert (TRACE RouTe) sends data packets to every computer on the path (internet) between one computer and another computer and clocks the packets' roundtrip times. This provides an indication of the time it takes a message to travel from one computer to another and back, ensures that the remote computer is online, and pinpoints any data traffic congestion. Route-tracing programs also calculate and display the number of hops between computers and the time it takes to traverse the entire one-way path between machines.

Route-tracing programs such as Tracert work by sending a series of packets to a particular destination. Each router along the internet path between the originating computer and the destination computer reports its IP address and the time it took to reach it. After the program completes its packet transmissions, it displays the number of hops and how much time it took to reach each node and travel the entire path.

Telnet and FTP utilities

Telnet is a program that allows users to log on to a computer that is connected to the internet. This remote login capability can be useful for running older software that does not have a web interface. Several Telnet client programs are available as free downloads on the internet, and Microsoft Windows systems include a Telnet client called Telnet.exe. Telnet lets a client computer give commands to programs running on a remote host. Telnet programs use a set of rules called the Telnet protocol.

The File Transfer Protocol (FTP) is the part of the TCP/IP rules that defines the formats used to transfer files between TCP/IP-connected computers. FTP can transfer files one at a time, or it can transfer many files at once. FTP also provides other useful services, such as displaying remote and local computers' directories, changing the current client's or servers active directory, and creating and removing local and remote directories.

Indexing and searching utility programs

Search engines and indexing programs are important elements of many web servers. Search engines or search tools search either a specific site or the entire web for requested documents. An indexing program can provide full-text indexing that generates an index for all documents stored on the server.

Data analysis software

Web servers can capture visitor information, including data about who is visiting a website (the visitor's URL), how long the visitor's web browser viewed the site, the date and time of each visit, and which pages the visitor viewed. This data is placed into a web log file. For popular sites, their web log file can be very large. It provides valuable information about how visitors are using the website.

Link-checking utilities

Just as an electrician would have a set of tools, a web site manager's tools include a standard set of features, starting with link checking. A link checker examines each page on the site and reports on any URLs that are broken, seem broken, or are in some way incorrect. It can also identify orphan files. An orphan file is a file on the website that is not linked to any page. Other important site management features include script checking and HTML validation. Some management tools can locate error-prone pages and code, list broken links, and e-mail maintenance results to site managers.

On the company web site, it is important to regularly check links that point to pages both within and outside the corporate web site. Some web server software does contain link-checking features. A dead link, when clicked, displays an error message rather than a web page. Maintaining a site that is free of dead links is vital because too many dead links on a site can cause visitors to jump to another site. Web-browsing customers are just a click away from going to a competitor's site if they become annoyed with an errant web link.

Remote server administration

With remote server administration, a web site administrator can control a web site from any internet-connected computer. Although all web sites provide administrative controls - most through a workstation computer on the same network as the server computer or through a web browser - it is convenient for an administrator to be able to fix the server from wherever he or she happens to be.

Web server hardware

Companies use a wide variety of computer brands, types, and sizes to host electronic commerce operations. Some small companies can run web sites on desktop PCs. However, most electronic commerce web sites are operated on computers designed for site hosting.

Server computers

Web server computers generally have more memory, larger (and faster) hard disk drives, and faster processors than the typical desktop or notebook PCs with which you are probably familiar. Many web server computers use multiple processors; very few desktop PCs have more than one processor. Because web server computers use more capable hardware elements and more of these elements, they are usually much more expensive than workstation PCs.

Today, a high-end desktop PC with 2 GB of RAM, a 3.6 GHz processor, a fast 400 GB SATA disk drive, a good monitor, and a complement of DVD/CD-RW drives costs between $2000 and $4000.

Web server performance evaluation

Benchmarking web server hardware and software combinations can help in making informed decisions for a system. Benchmarking, in this context, is testing that is used to compare the performance of hardware and software.

Elements affecting overall server performance include hardware, operating system software, server software, connection speed, user capacity, and type of web pages being delivered. When evaluating web server performance, a company should know exactly what factors are being measured and ensure that these are important factors relative to the expected use of the web server. Another factor that can

affect a web server's performance is the speed of its connection. A server on a T3 connection can deliver web pages to clients much faster than on a T1 connection.

The number of users the server can handle is also important. This can be difficult to measure because results are affected by the server's line speed, the clients' line speeds, and the sizes of the web pages delivered. Two factors to evaluate when measuring a server's web page delivery capability are throughput and response time. Throughput is the number of HTTP requests that a particular hardware and software combination can process in a unit of time. Response time is the amount of time a server requires to process one request. These values should be well within the anticipated loads a server can experience, even during peak load times.

Web server hardware architectures

Administrators of large web sites must plan carefully to configure their web server computers, which can number in the hundreds or even thousands, to handle the daily web traffic efficiently. These large collections of servers are called server farms because the servers are often lined up in large rooms, row after row, like crops in a field. One approach, sometimes called a centralized architecture, is to use a few very large and fast computers. A second approach is to use a large number of less powerful computers and divide the workload among them. This is sometimes called a distributed architecture or, more commonly, a decentralized architecture.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. A development site cannot reside on an existing PC running web server software.

____ 2. Linux is an open-source operating system that is easy to install, fast, and efficient.

____ 3. Search engines and indexing programs are not important elements of web servers.

____ 4. Administrators of large web sites must carefully configure their servers to handle the daily web traffic efficiently.

____5. The main job of a web server computer is to respond to requests from web client computers.

____6. The internet connects many different types of computers running different types of operating system software.

____7. Most server-side technologies are very fast.

____ 8. Microsoft IIS and various Sun servers together account for 75 percent of installed intranet server programs.

____ 9. Sun Microsystems sells web server hardware along with its UNIX-based operating system, FreeBSD.

____ 10. A black list spam filter can be implemented at the individual level.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. ____ sites, such as The Wall Street Journal and The New York Times, deliver news, histories, and other digital information.
    a.   Development   c.   B2B
    b.   Content delivery d.   B2C

____ 12. A(n) ____ file is a file on a web site that is not linked to any page.
    a.   lost   c.   orphan
    b.   index   d.   data

____ 13. ____ is nonstatic information constructed in response to a web client's request.
    a.   Static page   c.   Hyperlink
    b.   Dynamic content d.   Static link

____ 14. ____, developed by Microsoft, is a server-side scripting mechanism to build dynamic sites.
    a.   ASP   c.   ODBC
    b.   SQL   d.   Oracle

_____ 15. IIS's inclusion of _____ provides an application environment in which HTML pages, ActiveX components, and scripts can be combined to produce dynamic web pages.
   a.   Java   c.   ASP
   b.   CGI   d.   C++

_____ 16. Which of the following conducts continual surveys to tally the number of web sites in existence and measure the relative popularity of internet web server software?
   a.   Netscape   c.   Netcraft
   b.   CNN   d.   Amazon

_____ 17. A(n) _____ contains a command, the name of the target resource, and the protocol name and version number.
   a.   request header   c.   entity body
   b.   request line   d.   request message

_____ 18. A(n) _____ indicates the HTTP version used by the server, the status of the response, and an explanation of the status information.
   a.   response header field   c.   response entity body
   b.   response header message   d.   response header line

_____ 19. _____ programs calculate and display the number of hops between computers.
   a.   Link checker   c.   Benchmarking
   b.   Server architecture d.   Route tracing

_____ 20. _____ allows the user to log on as a guest.
   a.   Dynamic FTP   c.   Full-privilege FTP
   b.   Anonymous FTP   d.   Guest FTP

Essay questions

21. Describe the difference between throughput and response time.

22. What is the purpose of the Ping utility?

23. List three types of web sites and describe the purpose of each.

24. Describe the major components of a typical request message from a client server.

25. What are some of the disadvantages of e-mail?

Chapter 9

9   Electronic commerce software

Introduction

E-commerce businesses can vary in size, from a company started and run by one person from their PC at home, to multi-national conglomerates. In this chapter, you will learn that whatever the size, most e-commerce projects combine software and tools from different vendors to accomplish their goals. Even small companies rarely use products from a single source, as different software products perform different tasks or processes. This chapter is about which software is most suited to which task, and how different software packages work when they are integrated together.

Student reading

It is strongly advised that you now read Chapter 9 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Compare and contrast web hosting services.
- Discuss the basic functions of electronic commerce software.
- Describe and analyse the advanced functions of electronic commerce software.
- Compare and contrast electronic commerce software for small, midsize and large businesses.

Subject summary

Chapter overview

Now that e-commerce is an established and profitable industry, there are a bewildering number of software packages available to run an e-business. Choosing the right combination to fulfil a company's objectives can seem as confusing as working out why some packages are available for free and some cost more than $200,000 (£100,000). This chapter describes the key functions and facilities offered by the range of electronic commerce software available to date.   In particular the chapter details the desirable functions of electronic commerce software and ISP-hosted solutions.   It contrasts traditional and electronic shops and provides an overview of software packages for small, medium and large electronic commerce sites.   This chapter also discusses the characteristics of several of the leading electronic commerce sites in order to give you an understanding of how electronic commerce software is being used by real businesses.

The key factors that will determine which kind of electronic commerce software is best suited to a company are:

- What are the projected levels of throughput and sales that the company envisages will be processed via the website.
- Who are the target audience and what kind of information will need to be presented to them.
- What is the technical ability of the company in terms of its staff, equipment and training.
- How much money is available to establish the electronic commerce enterprise.

Web hosting alternatives

A client company can choose from several different types of hosting arrangements offered by service providers. These include shared hosting, dedicated hosting, and co-location. Shared hosting means that a client's website is operated by the server provider at the server's location. The server hosts many other clients' websites alongside each other. With dedicated hosting, the service provider makes a web server available to the client, but the client does not share the server with other clients of the service provider. The service provider concentrates solely on operating one client's site. In both shared hosting and dedicated hosting, the service provider owns the server hardware and leases it to the client. The service provider is responsible for maintaining the web server hardware and software, and provides the connection to the internet through its routers and other network hardware. In a co-location (also spelled collocation and colocation) service, the service provider rents a physical space to the client to install its own server hardware. The client installs its own software and maintains the server. The service provider is responsible only for providing a reliable power supply and a connection to the internet through its routers and other networking hardware.

Basic functions of electronic commerce software

As well as vast variations in price, e-commerce software can be required to perform just a few fundamental operations to a complete operational solution. However, all e-commerce solutions must provide at least the following basic functions:

- A catalogue display
- Shopping cart capabilities
- Transaction processing

A small commerce site can have a very simple static catalogue. A catalogue is a listing of goods and services. A static catalogue is a simple list written in HTML that appears on a web page or a series of web pages. To add an item, delete an item, or change an item's listing, the company must edit the HTML of one or more pages. Larger commerce sites are more likely to use a dynamic catalogue. A dynamic catalogue stores the information about items in a database, usually on a computer that is separate from but accessible to, the server that is actually running the web site. A dynamic catalogue can feature multiple photos of each item, detailed descriptions, and a search feature that allows customers to search for an item and determine its availability.

Shopping cart

In the early days of electronic commerce, shoppers selected items they wanted to purchase by filling out online forms. Using text box and list box form controls to indicate their choices, users entered the quantity of an item in the quantity text box, the SKU (stock-keeping unit) or product number in another text box, and the unit price in yet another text box. This system was awkward for ordering more than one or two items at a time.

The forms-based method of ordering has given way to electronic shopping carts. Today, shopping carts are a standard of electronic commerce. A shopping cart, sometimes called a shopping bag or shopping basket, keeps track of the items the customer has selected and allows customers to view the contents of their carts, add new items, or remove items. To order an item, the customer simply clicks that item. All of the details about the item, including its price, product number, and other identifying information, are stored automatically in the cart. If a customer later changes his or her mind about an item, he or she can view the cart's contents and remove the unwanted items. When the customer is ready to conclude the shopping session, a click of a button executes the purchase transaction.

Transaction processing

Transaction processing occurs when the shopper proceeds to the virtual checkout counter by clicking a checkout button. Then the electronic commerce software performs any necessary calculations, such as volume discounts, sales tax, and shipping costs. At checkout, the customer's web browser software and the seller's web server software both switch into a secure state of communication.

Transaction processing can be the most complex part of the online sale. Computing taxes and shipping costs are important parts of this process, and site administrators must continually check tax rates and shipping tables to make sure they are current. Some software enables the web server to obtain updated shipping rates by connecting directly to shipping companies to retrieve information.

Learning activity

Think about all the internet purchases that you have made (if you have not bought any items over the internet then visit some internet shops to see how they process orders, make use of shopping carts etc). Which sites do you find easiest to use? Which have the best catalogue displays, the best shopping carts, etc? Do you return to the same shops again and again because they are most functional? Conversely do you avoid return visits to some sites because of their lack of functionality? Write a list of the best features that in your opinion an internet shopping site should aim to include.

Advanced functions of electronic commerce software

In this section, you will learn about the features that larger companies need in their electronic commerce software. Although there are exceptions, such as Amazon.com and Buy.com, most large companies that have electronic commerce operations also have substantial business activity that is not related to electronic commerce. Thus, integrating electronic commerce activities into the company's other operations is very important.

Middleware

Larger companies usually establish the connections between their electronic commerce software and their existing accounting system by using a type of software called middleware. Some large companies that have sufficient IT staff to write their own middleware. However, most companies purchase middleware that is customized for their businesses by a middleware vendor or a consulting firm. Thus, most of the cost of middleware is not the software itself, but the consultation fees needed to make the software work in a given company. Making a company's information systems work together is called *interoperability* and is an important goal of companies when they install middleware.

Enterprise application integration and databases

A program that performs a specific function, such as creating invoices, calculating payroll, or processing payments received from customers, is called an *application program*, application software or, more simply, an application. An application server is a computer that takes the request messages received by the web server and runs application programs that perform some kind of action based on the contents of the request messages. The actions that the application server software performs are determined by the rules used in the business. These rules are called business logic. An example of a business rule is: When a customer logs in, check the password entered against the password file in the database.

Application servers are usually grouped into two types: page-based and component-based systems. Page-based application systems return pages generated by scripts that include the rules for presenting data on the web page with the business logic. Larger businesses often prefer to use a component-based application system that separates the presentation logic from the business logic. Each component of logic is created in its own module.

Web services

Companies are beginning to extend the idea of application server systems so that these programs can communicate across organizational boundaries. Although a generally accepted definition has not yet evolved, many IT professionals define web services as: a combination of software tools that let application software in one organization communicate with other applications over a network by using a specific set of standard protocols known by their acronyms, SOAP, UDDI, and WSDL. Another definition of web services that IT professionals use is: a self-contained, modular unit of application logic that provides some business functionality to other applications through an internet connection.

Integration with ERP systems

Many B2B websites must be able to connect to existing information systems such as enterprise resource planning software. Enterprise resource planning (ERP) software packages are business systems that integrate all facets of a business, including accounting, logistics, manufacturing, marketing, planning, project management, and treasury functions. The major ERP vendors include Baan, Oracle, PeopleSoft, and SAP. A typical installation of ERP software costs between $2 million and $25 million; thus, companies that are already running these systems have made a significant investment in them and expect their electronic commerce sites to integrate with them.

Electronic commerce software for small and midsized companies

Using a service provider's shared or dedicated hosting services instead of building an in-house server or using a co-location service means that the staffing burden shifts from the company to the web host. CSPs have the same advantages as ISP hosting services, including spreading the cost of a large web site over several "renters" hosted by the service. The biggest single advantage - low cost - occurs because the host provider has already purchased the server and configured it. It is also the host provider who has to worry about keeping the server working through lightning storms and power outages.

Mall-style commerce service providers

Mall-style CSPs provide small businesses with an internet connection, web site creation tools, and little or no banner advertising clutter. Web hosts in this group charge a monthly fee that is often higher than that of lower-end providers, and they may also charge one-time setup fees. Some of these providers also charge a percentage of or fixed amount for each customer transaction. These web hosts also provide high quality tools, storefront templates, an easy-to-use interface, and quick web page generation capabilities and page maintenance.

Mall-style CSPs provide shopping cart software or the ability to use another vendor's shopping cart software. They also furnish customer payment processing so that customers can choose to purchase their goods and services with a credit card or other form of payment. The CSP processes the acceptance and authorization of credit cards on behalf of the merchant. Another benefit is that because they are paying a monthly fee to the CSP, sites do not have to display any web banners, which can be unattractive and distracting. The fourth benefit of the mall-style CSPs is that they provide higher-quality web store building and maintenance tools than do the basic CSPs.

Estimated operating expenses for a small web business

A reasonable guideline for payment processing fees that would be charged to a new merchant opening a business on the web is about 3 percent of gross sales. Thus, if a site's annual gross sales are $50,000, then the payment processing fees should be approximately $1500. That estimate would include both the per-transaction fixed costs and the percentage of total sales costs charged by most merchant credit card processing agencies.

Electronic commerce software for midsize to large businesses

Midrange packages allow the merchant to have explicit control over merchandising choices, site layout, internal architecture, and remote and local management options. In addition, the midrange and basic electronic commerce packages differ on price, capability, database connectivity, software portability, software customization tools, and computer expertise required of the merchant.

Web site development tools
Although they are more often used for creating small business sites, it is possible to construct the elements of a midrange electronic commerce web site using web page creation and site management tools. For example, recent versions of Macromedia Dreamweaver all include integrated development environments.

Intershop Enfinity
This software package provides search and catalogue capabilities, electronic shopping carts, online credit card transaction processing, and the ability to connect to existing back-end business systems and databases.

IBM WebSphere Commerce Professional Edition
This is formulated as a set of software components that provides software suitable for midsize to large businesses to sell goods and services on the internet. It includes catalogue templates, setup wizards, and advanced catalogue tools to help companies create attractive and efficient electronic commerce sites.

Microsoft Commerce Server 2002
This product includes marketing tools for businesses to selling their products or services on the web. It provides tools such as user profiling and management, transaction processing, product and service management, and target audience marketing.

Electronic commerce software for large businesses

Larger businesses require many of the same advanced capabilities as midsize firms, but the larger firms need to handle higher transaction loads. In addition, they need dedicated software applications to handle specific elements of their online business. In this section, you will learn about electronic commerce software that has higher transaction-load capability. You will also learn about software that accomplishes specific tasks in large businesses, such as customer relationship management, supply chain management, content management, and knowledge management.

Enterprise-class electronic commerce software

Enterprise-class electronic commerce software running large online organizations usually requires several dedicated computers - in addition to the web server system and any necessary firewalls. Examples of enterprise-class products that can be used to run a large online business with high transaction rates include IBM WebSphere Commerce Business Edition, Oracle E-Business Suite, and Broadvision One-To-One Commerce.

Customer relationship management software

This software obtains data from operations software that conducts activities such as sales automation, customer service centre operations, and marketing campaigns. The software must also gather data about customer activities on the company's web site and any other points of contact the company has with its existing and potential customers.

Supply chain management software

Helps companies to coordinate planning and operations with their industry supply chain partners. SCM software performs two general types of functions: planning and execution.

Content management software

Helps companies control the large amounts of text, graphics, and media files that have become a key part of doing business. With the rise of wireless devices, such as mobile phones, handheld computers, and personal digital assistants (PDAs), content management has become even more important.

Knowledge management software

Helps companies do four main things: collect and organize information, share the information among users, enhance the ability of users to collaborate, and preserve the knowledge gained through the use of information so that future users can benefit from the learning of current users. KM software includes tools that read electronic documents (in formats such as Microsoft Word or Adobe PDF), scanned paper documents, e-mail messages, and web pages.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

_____ 1. CartIt is one company that sells shopping cart software.

_____ 2. WebSphere Commerce Professional Edition can only be used for business-to-business applications.

_____ 3. Creating an online store can be much more expensive than building a chain of retail stores.

_____ 4. Large electronic commerce sites do not need to include customer relationship management software.

_____ 5. Page-based systems do not work well for small and midsize web sites.

_____ 6. PHP is a paged-based server system.

_____ 7. The database mySQL is not open source software.

_____ 8. Bigstep has received many industry awards for its CSP offering.

_____ 9. Most of the cost of middleware is not the software itself, but the consulting fees needed to make the software work in a given company.

_____ 10. Basic CSPs provide higher-quality web store building and maintenance tools than mall-style CSPs.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

_____ 11. A(n) _____ is a listing of goods and services.
      a.   file   c.   catalogue
      b.   database   d.   record

_____ 12. In the earlier days of electronic commerce, shoppers selected items they wanted to purchase by filling out _____.
      a.   online forms   c.   telephone numbers
      b.   questionnaires   d.   product numbers

_____ 13. One way to uniquely identify users and to store information about their choices is to create and store _____.
      a.   RAM   c.   hard drives
      b.   cookies   d.   CD-RAM

_____ 14. _____ is used to look for hidden patterns in data.
      a.   Data mining   c.   Data warehousing
      b.   Data base   d.   Report generation

____ 15. A reasonable guideline for payment processing fees that would be charged to a new merchant opening a business on the web is about ____ percent of gross sales.
a.   3   c.   15
b.   10   d.   20

____ 16. A(n) ____ is a computer that takes the request messages received by the web server and runs application programs that perform some kind of action based on the contents of the request message.
a.   application server   c.   Component Object Model
b.   database manager   d.   SCM

____ 17. Application servers are usually grouped into two types: page-based and ____.
a.   server-based   c.   script-based
b.   component-based   d.   group-based

____ 18. A(n) ____ is software that stores information in a highly structured way.
a.   database manager   c.   information manager
b.   information server   d.   enterprise manager

____ 19. The characteristics of the logic unit that make up specific web services are described using the ____.
a.   WSDL   c.   W3C
b.   UDDI   d.   SOAP

____ 20. The set of protocols that identify locations of web services and their associated WSDL descriptions is called the ____ specification.
a.   WSDL   c.   W3C
b.   UDDI   d.   SOAP

Essay questions

21. List at least five software components that large and complex electronic commerce sites can include in addition to a catalogue display, shopping cart capabilities, and transaction processing.

22. What is the difference between a static catalogue and a dynamic catalogue?

23. What is the purpose of supply chain management software?

24. What are the benefits of using a mall-style commerce service provider?

25. What is the difference between shared hosting and dedicated hosting?

Chapter 10

10 Electronic commerce security

Introduction

In this chapter, you will learn about the importance of having an adequate e-commerce security policy. Every stage of e-commerce that you have learned about so far needs to be protected; this chapter is organised according to a transaction processing flow, beginning with the consumer and ending with the web server (or servers) at the electronic commerce site. As e-commerce has grown, so have ways to infiltrate secure information. Thus security practices have to continue to develop as the technology develops. Each logical link in the process includes assets that must be protected to ensure security. These include client computers, the communication channel on which the messages travel, and the web servers, and any other computers, such as databases, connected to the web servers.

Student reading

It is strongly advised that you now read Chapter 10 of the recommended course text:

Electronic Commerce by Gary Schneider.
Publisher: Course Technology Inc., 2007, ISBN: 1418837032.

Learning objectives

By the end of this chapter and the relevant reading you will be able to:

- Discuss online security issues.
- Describe security measures for client computers.
- Discuss security for the communication channels between computers.
- Discuss security for server computers.
- Compare and contrast organizations that promote computer, network, and internet security.

Subject summary

Chapter overview

Computer security is the protection of assets from unauthorized access, use, alteration, or destruction. Any act, or object, that poses a danger to computer assets is known as a threat. Both businesses and computers used to be solely physical entities, and therefore they were physically secured. Money was stored in safes, guarded by security guards, and early computers were placed in locked rooms where only a few experts had access. As e-commerce has developed into the form we know today, there are still some physical elements that need protecting. Physical security includes tangible protection devices, such as alarms, guards, fireproof doors, security fences, safes or vaults, and bombproof buildings. However, there are also a huge amount of non-physical aspects which also need protecting. This is called logical security.

It is imperative when developing a successful electronic commerce application to have a good understanding of why secrecy, integrity and necessity are the three core parts of any security program. This chapter describes the major security threats to electronic commerce websites. The chapter discusses the important computer and electronic commerce security terms and explains why issues such as secrecy, integrity and necessity are important parts of any security program. The role of copyright and intellectual property is explored together with counter-measures to safeguard such property from

theft. This chapter also identifies the specific threats to client machines, WWW servers and electronic commerce servers.

Learning activity

Three aspects of security are prevention, detection and reaction. Write a paragraph explaining why methods used for the prevention of, detection of and reaction to, theft of physical property such as a car, may not be appropriate when the crime involves the theft of digital information.

Copyright and intellectual property issues

Copyright gives protection to the originator of material, such as textual, pictorial, graphical or audio work, to prevent another using it without express permission or acknowledgement of the originator. Intellectual property is concerned with the ownership of ideas and the control over the tangible or virtual representation of such ideas. In the majority of countries both copyright and intellectual property are protected by laws. For example the US Copyright Act of 1976 protects copyright for a limited period of time; the UK has similar laws.

The internet and the WWW present a target for those who wish to steal others' intellectual property. It is relatively easy to reproduce an exact copy of anything that may be found on the internet. Furthermore, at present, many people are still unaware of intellectual and copyright laws and therefore unwittingly infringe on them.

A specific intellectual property threat is cybersquatting. Cybersquatting is the practice of one party registering a domain name that is a recognised trade mark or operating name for some other party. The aim of cybersquatting is that the real owner of the trademark will pay the cybersquatters in order to gain control of that domain name.

Managing risk

When a procedure is developed to recognise, reduce, or eliminate a threat, it is called a *countermeasure*. It can be either physical or logical. The extent and expense of countermeasures can vary, depending on the importance of the asset at risk. Threats that are deemed low risk and unlikely to occur can be ignored when the cost to protect against the threat exceeds the value of the protected asset.

A *cracker* is a technologically skilled person who uses their skills to obtain unauthorized entry into computers or network systems - usually with the intent of stealing or damaging information, system software, or even hardware. The media and general public use the term hacker to describe this person who uses computer skills to cause harm. However, computer professionals still use the term hacker to describe positive practices, as originally hacker meant a dedicated programmer who enjoyed writing complex code that tested the limits of technology, and therefore make a strong distinction between cracker and hacker. Others also use the terms white hat hacker and black hat hacker to make the distinction between good hackers and bad hackers.

Security for client computers

Threats can occur in software and data downloaded from the web – especially active content delivered over the internet in dynamic web pages – so client computers must be protected from these threats. Another threat to client computers can arise when a malicious server site impersonates a legitimate web site. Users and their client computers can be duped into revealing information to those web sites.

Cookies

Cookies are parcels of text that are sent by a server to a web browser and then sent back unchanged by the browser each time it accesses that server. Cookies are used for authentication, tracking and maintaining specific information about users, such as site preferences or the contents of their electronic shopping carts. Can be categorised in two ways: by time duration, and by source. The two kinds of time duration cookie categories are: session cookies, which exist until the web client ends the connection (or "session"), and persistent cookies, which remain on the client computer indefinitely. Electronic commerce sites use both kinds of cookies.

When analysing cookies by their source, they can either be first-party cookies or third-party cookies. Cookies can be placed on the client computer by the web server site, in which case they are called first-party cookies, or they can be placed by a different web site, in which case they are called third-party cookies. A third-party cookie originates on a web site other than the site being visited. These third-party web sites usually provide advertising or other content that appears on the web site being viewed. The third-party web site providing the advertising is often interested in tracking responses to their ads by visitors who have already seen the ads on other sites. If the advertising web site places its ads on a large number of web sites, it can use persistent third-party cookies to track visitors from one site to another.

Web bugs

A web bug is a tiny graphic that a third-party web site places on another site's web page. When a site visitor loads the web page, the web bug is delivered by the third-party site, which can then place a cookie on the visitor's computer. A web bug's only purpose is to provide a way for a third-party web site (the identity of which is unknown to the visitor) to place cookies from that third-party site on the visitor's computer.

Active content

Before executable web content, web pages could do little more than display content and provide links to related pages with additional information. The widespread use of active content has changed the situation. Active content refers to programs that are embedded transparently in web pages and that cause action to occur.

Active content is provided in several forms. The best-known active content forms are cookies, Java applets, JavaScript, VBScript, and ActiveX controls. Other ways to provide web active content include graphics, web browser plug-ins, and e-mail attachments.

JavaScript and VBScript are scripting languages; they provide scripts, or commands, that are executed. An applet is a small application program. Applets typically run within the web browser. Active content is launched in a web browser automatically when that browser loads a web page containing active content. The applet downloads automatically with the page and begins running. Depending on how the browser's security settings are configured, the browser might open a warning dialog box announcing the active content and asking the user for permission to open that content.

Java applets

Java adds functionality to business applications and can handle transactions and a wide variety of actions on the client computer. This relieves an otherwise busy server-side program from handling thousands of transactions simultaneously. Once downloaded, embedded Java code can run on a client's computer, which means that security violations can occur. To counter this possibility, a security model called the Java sandbox has been developed. The Java sandbox confines Java applet actions to a set of rules defined by the security model. These rules apply to all untrusted Java applets. Untrusted Java applets are those that have not been established as secure. When Java applets are run within the constraints of the sandbox, they do not have full access to the client system.

JavaScript

JavaScript is a scripting language developed by Netscape to enable web page designers to build active content. Despite the similar-sounding names, JavaScript is based only loosely on Sun's Java programming language. Supported by popular web browsers, JavaScript shares many of the structures of the full Java language.

When a user downloads a web page with embedded JavaScript code, it executes on the user's (client) computer. Like other active content vehicles, JavaScript can be used for attacks by executing code that destroys the client's hard disk, discloses the e-mail stored in client mailboxes, or sends sensitive information to the attacker's web server. JavaScript code can also record the URLs of web pages a user visits and capture information entered into web forms. For example, if a user enters credit card numbers while reserving a rental car, a JavaScript program could copy the credit card number. JavaScript programs, unlike Java applets, do not operate under the restrictions of the Java sandbox security model.

ActiveX controls

An ActiveX control is an object that contains programs and properties that web designers place on web pages to perform particular tasks. ActiveX components can be constructed using many different programming languages, but the most common are C++ and Visual Basic. Unlike Java or JavaScript code, ActiveX controls run only on computers with Windows operating systems.

Graphics and plug-ins

Graphics, browser plug-ins, and e-mail attachments can harbour executable content. Some graphics file formats have been designed specifically to contain instructions on how to render a graphic. That means that any web page containing such a graphic could be a threat because the code embedded in the graphic could cause harm to a client computer. Similarly, browser plug-ins, which are programs that enhance the capabilities of browsers, handle web content that a browser cannot handle. Plug-ins are normally beneficial and perform tasks for a browser, such as playing audio clips, displaying movies, or animating graphics. Apple's QuickTime, for example, is a plug-in that downloads and plays movies stored in a special format.

Plug-ins can also pose security threats to a client computer. Users download these plug-in programs and install them so their browsers can display content that cannot be included in HTML tags. Popular plug-ins include Macromedia's Flash Player and Shockwave Player, Apple's QuickTime Player, and RealNetworks' RealPlayer.

Viruses, worms, and antivirus software

A virus is software that attaches itself to another program and can cause damage when the host program is activated. A worm is a type of virus that replicates itself on the computers that it infects. Worms can spread quickly through the internet. A macro virus is a type of virus that is coded as a small program, called a macro, and is embedded in a file.

In 2001, the incidences of virus and worm attacks increased. With more than 40,000 reported security violations occurring that year, the parade of attacks included Code Red and Nimda virus-worm combinations, each affecting millions of computers and costing billions of dollars to clean up. Both Code Red and Nimda are examples of a multivector virus, so called because they can enter a computer system in several different ways (vectors). Even though Microsoft issued security patches that should have stopped the Code Red virus-worm, it continued to propagate throughout the internet in 2002. Both the original Code Red virus and a variant called Code Red 2 infected thousands of new computers during the year.

Digital certificates

One way to control threats from active content is to use digital certificates. A digital certificate or digital ID is an attachment to an e-mail message or a program embedded in a web page that verifies

that the sender or web site is who or what it claims to be. In addition, the digital certificate contains a means to send an encrypted message (encoded so others cannot read it) to the entity that sent the original web page or e-mail message.

Steganography

The term *steganography* describes the process of hiding information (a command, for example) within another piece of information. This information can be used for malicious purposes. Frequently, computer files contain redundant or insignificant information that can be replaced with other information. This other information resides in the background and is undetectable by anyone without the correct decoding software. Steganography provides a way of hiding an encrypted file within another file so that a casual observer cannot detect that there is anything of importance in the container file. In this two-step process, encrypting the file protects it from being read, and steganography makes it invisible.

Physical security for clients

Devices that read fingerprints are now available for personal computers. These devices, which cost less than $200, provide a much stronger protection than traditional password approaches. In addition to fingerprint readers, companies can use other biometric security devices that are more accurate and, of course, cost more. A biometric security device is one that uses an element of a person's biological makeup to perform the identification.

Communication channel security

Today, the internet remains largely unchanged from its original, insecure state. Message packets on the internet travel an unplanned path from a source node to a destination node. A packet passes through a number of intermediate computers on the network before reaching its final destination. The path can vary each time a packet is sent between the same source and destination points. Because users cannot control the path and do not know where their packets have been, it is possible that an intermediary can read the packets, alter them, or even delete them. That is, any message travelling on the internet is subject to secrecy, integrity, and necessity threats. This section describes these problems in more detail and outlines several solutions for those problems.

Secrecy threats

Secrecy is the prevention of unauthorised access and disclosure of information. It is the security threat that is most frequently mentioned in articles and the popular media. Closely linked to secrecy is privacy, which also receives a great deal of attention. Secrecy and privacy, though similar, are different issues. Where secrecy is the prevention of unauthorized information disclosure, privacy is the protection of individual rights to nondisclosure. The Privacy Council, which helps businesses implement smart privacy and data practices, created an extensive web site surrounding privacy - covering both business and legal issues. Secrecy is a technical issue requiring sophisticated physical and logical mechanisms, whereas privacy protection is a legal matter.

One significant threat to electronic commerce is theft of sensitive or personal information, including credit card numbers, names, addresses, and personal preferences. This kind of theft can occur any time anyone submits information over the internet because it is easy for an ill-intentioned person to record information packets (a secrecy violation) from the internet for later examination. The same problems can occur in email transmissions. Software applications called *sniffer* programs provide the means to record information that passes through a computer or router that is handling internet traffic. Using a sniffer program is analogous to tapping a telephone line and recording a conversation. Sniffer programs can read e-mail messages and unencrypted web client server message traffic such as user logins, passwords, and credit card numbers.

Integrity threats are concerned with - and also known as - active wire tapping. Integrity is destroyed when an unauthorized party can alter a message stream of information. Unprotected banking transactions, such as deposit amounts transmitted over the internet, are subject to integrity violations.

Of course, an integrity violation implies a secrecy violation because an intruder who alters information can read and interpret that information. Unlike secrecy threats, where a viewer simply sees information he or she should not, integrity threats can cause a change in the actions a person or corporation takes because a mission critical transmission has been altered.

Cybervandalism is an example of an integrity violation. Cybervandalism is the electronic defacing of an existing web site's page. The electronic equivalent of destroying property or placing graffiti on objects, cybervandalism occurs whenever someone replaces a web site's regular content with his or her own pornographic material and other offensive content.

Masquerading or *spoofing* - pretending to be someone you are not, or representing a web site as an original when it is a fake - is one means of disrupting web sites. Domain name servers (DNSs) are the computers on the internet that maintain directories that link domain names to IP addresses. Perpetrators can use a security hole in the software that runs on some of these computers to substitute the addresses of their web sites in place of the real ones to spoof web site visitors.

Necessity threats

Necessity threats, often referred to as delay, denial, or denial of service (DoS) attacks, are concerned with the disruption of the transaction processing of an electronic commerce website. Their purpose is to disrupt normal computer processing, or deny processing entirely. A computer that has experienced a necessity threat slows processing to an intolerably slow speed. For example, if the processing speed of a single ATM transaction slows from one or two seconds to 30 seconds, users will abandon ATMs entirely. Similarly, slowing any internet service drives customers to competitors' web or commerce sites — possibly discouraging them from ever returning to the original commerce site.

Learning activity

Consider a computer system that you are familiar with. Perhaps you have a networked system where you work or study, or a PC at home that is used by more than one person. How good is the security of the system? How easy is it to access other people's files or to read their emails? How difficult would it be to add extra security to the system?

Threats to the physical security of internet communications channels

The internet was a U.S. government research project developed to provide technology for coordinating military operations which was attack-resistant. Therefore inherent in its structure the fundamental design withstands attacks on its physical communication links. Thus, the internet's packet based network design precludes it from being shut down by an attack on a single communications link on that network. This remains a useful security tool for one of the main areas of internet use today – e-commerce.

Threats to wireless networks

Wireless Encryption Protocol (WEP) is a set of rules for encrypting transmissions from wireless devices to Wireless Access Points (WAPs). Companies that have large wireless networks are usually careful to turn on WEP in devices, but smaller companies and individuals who have installed wireless networks in their homes often do not turn on the WEP security feature. Many WAPs are shipped to buyers with a default login and password already set. Companies that install these WAPs sometimes fail to change that login and password. This has given rise to a new avenue of entry into networks.

Encryption solutions

Encryption is an ancient method of writing in a mathematical code which only the correct party is given the key to unlock, to ensure secret communication cannot be intercepted and read. The science that studies encryption is called cryptography, which comes from a combination of the two Greek words *krypto* and *grapho*, which mean "secret" and "writing," respectively. That is, cryptography is the science of creating messages that only the sender and receiver can read. This type of code writing is perfect for computers as their engineering can quickly master mathematical codes. Thus, e-commerce encryption is the coding of information by using a mathematically based program and a secret key to produce a string of characters that is unintelligible.

Unlike stegeography which makes text undetectable to the naked eye, cryptography does not hide text; it converts it to other text that is visible, but does not appear to have any meaning. An unauthorized reader sees only a string of random text characters, numbers, and punctuation.

Ensuring transaction integrity with hash functions

Hash coding is a process which creates a fingerprint unique for a particular message. It does this by using a hash algorithm to calculate a number (a hash value) from a message of any length.

However, hash functions are not a complete solution. Because the hash algorithm is public and (by design) widely known, anyone could intercept a purchase order, alter the shipping address and quantity ordered, re-create the message digest, and send the message and new message digest on to the merchant. Upon receipt, the merchant would calculate the message digest value and confirm that the two message digest values match. The merchant is fooled into concluding that the message is unadulterated and genuine. To prevent this type of fraud, the sender encrypts the message digest using his or her private key.

Ensuring Transaction Integrity with Digital Signatures

Electronic commerce ultimately involves a client browser sending payment information, order information, and payment instructions to the web server and that server responding with a confirmation of the order details. If an internet interloper alters any of the order information in transit, harmful consequences can result. For instance, the perpetrator could alter the shipment address so that he or she receives the merchandise instead of the original customer. This is an example of an integrity violation, which occurs whenever a message is altered while in transit between the sender and receiver.

The use of digital signatures which consist of an encrypted version of the message (or part of the message) generated using a private key known only to the genuine signer can prevent integrity violation.

Guaranteeing transaction delivery

Neither encryption nor a digital signature protects information packets from theft or slowdown. However, the Transmission Control Protocol (TCP) half of the TCP/IP pair is responsible for end-to-end control of packets. When it reassembles packets at the destination in the correct order, it handles all the details when packets do not appear. Among TCP's duties are to request that the client computer resends data when packets seem to be missing. Therefore no special computer security protocol beyond TCP/IP is required as a countermeasure against denial attacks. TCP/IP builds checks into the data so that it can tell when data packets are altered, inadvertently or otherwise.

Security for server computers

From the user to the web server, the e-commerce path is client-internet-server; the server being the third link. Servers have vulnerabilities that can be exploited by anyone determined to cause destruction or acquire information illegally. One entry point is the web server and its software. Other entry points are any backend programs containing data, such as a database and the server on which it runs.

Although no system is completely safe, the web server administrator's job is to make sure that security policies are documented and considered in every part of the electronic commerce operation.

Web server and database threats

If web server software is complex, it holds probability that security weaknesses or coding errors are contained within it and can be exploited. For instance, a web server can compromise secrecy if it allows automatic directory listings. The secrecy violation occurs when the contents of a server's folder names are revealed to a web browser.

Most e-commerce websites rely on a backend database. Therefore it is vital that this database is held on a computer which is secure, and cannot be easily accessed or maliciously tampered with. Any unauthorised disclosure of valuable or private information held within the database could irreparably damage an electronic commerce site's reputation. In order to secure databases from such unauthorised disclosure it is generally recommended that security procedures such as passwords and usernames for databases are implemented separately than those for the electronic commerce WWW server itself. It is important that the company has secure access control and authentication procedures controlling who and what has access to the web server. However, it must be realised that this is not always possible and that some databases such as MySQL rely on a WWW server to enforce any security measures.

Additionally, the physical security of the database and server also warrant protection from threats. Many companies maintain backup copies of server contents at a remote location. If the web server operation is critical to the continuation of the business, a company can maintain a duplicate of the entire web server physical facility at a remote location.

Trojan horse programs hidden within a database system can reveal information by changing the access rights of various user groups. A Trojan horse can even remove access controls within a database, giving all users complete access to the data - including intruders.

Other programming threats

A buffer is an area of memory allocated to facilitating input and output operations by holding data read from a file or database. When a buffer overflows spilling the excess data outside the designated buffer memory area, an error condition exists and the computer system may crash. This is called a buffer overrun or buffer overflow error.

Firewalls

A firewall is either just software, or a hardware and software combination, that is installed in a network to control the packet traffic moving through it. Most organizations place a firewall at the internet entry point of their networks. The firewall provides a defence between the network to be protected – e.g. a company's network – and the internet, or between a network and any other network that could pose a threat.

Firewalls are characterised by the following features: all traffic from inside to outside, and from outside to inside the network must pass through it; and only authorized traffic, as defined by the local security policy, is allowed to pass through it. Additionally, the firewall itself is immune to penetration.

Organizations that promote computer security

After 1988's Internet Worm, a number of organizations were formed to share information about threats to computer systems. These organizations are devoted to the principle that sharing information about attacks and defences for those attacks can help everyone create better computer security. Some of the organizations began at universities; others were launched by government agencies. In this section, you will learn about some of these organizations and their resources.

CERT

The creation of CERT was inspired by the attack of the infamous Internet Worm attack. Soon after it occurred, a group of researchers came together with the objective of studying how worms worked and how to prevent damage from future attacks of this type. The National Computer Security Centre, part of the National Security Agency, initiated a series of meetings to figure out how to respond to future security breaks that might affect thousands of people. Soon after that meeting of security experts in 1988, the U.S. government created the Computer Emergency Response Team and housed it at Carnegie Mellon University in Pittsburgh. The organization is now operated as part of the federally funded Software Engineering Institute at Carnegie Mellon, and it has changed its legal name from the Computer Emergency Response Team (which had been abbreviated to "CERT" by most people who wrote and talked about it) to CERT.

Other organizations

CERT is the most prominent of these organizations and has formed relationships, such as the Internet Security Alliance, with other industry associations. However, CERT is not the only computer security resource. In 1989, one year after CERT was formed, a cooperative research and educational organization called the Systems Administrator, Audit, Network, and Security Institute was launched. Now known as the SANS Institute, this organization includes more than 150,000 members who work in computer security consulting firms and information technology departments of companies as auditors, systems administrators, and network administrators.

Computer forensics and ethical hacking

A small group of firms, endorsed by corporations and security organizations, have the unlikely job of breaking into client computers. Called computer forensics experts or ethical hackers, these computer sleuths are hired to probe PCs and locate information that can be used in legal proceedings. The field of computer forensics is responsible for the collection, preservation, and analysis of computer-related evidence. Ethical hackers are often hired by companies to test computer security safeguards.

Review questions

True/False questions

Indicate whether each of the following statements is true or false.

____ 1. JavaScript and VBScript are examples of active content forms.

____ 2. When Java applets are run within the constraints of the sandbox, they have full access to the client system.

____ 3. Zombie attacks can be traced back to their creators very easily.

____ 4. Message packets on the internet travel a planned path from a source node to a destination node.

____ 5. When a Windows-based web browser downloads a web page containing an embedded ActiveX control, the control is executed on the client computer.

____ 6. Active content is launched in a web browser automatically when that browser loads a web page containing active content.

____ 7. Secrecy protection is a legal matter.

____ 8. E-mail secrecy issues address whether company supervisors should be permitted to read employees' messages randomly.

____ 9. The shorter the session key, the more resistant the encryption is to attack.

____ 10. Developers use active content because it extends the functionality of HTML and moves some data processing chores from the busy server machine to the user's client computer.

Multiple choice questions

Identify the choice that best completes the statement or answers the question.

____ 11. ____ refers to protecting against unauthorized data disclosure and ensuring the authenticity of the data source.
a.   Necessity   c.   Integrity
b.   Secrecy   d.   Harmony

____ 12. Java is a programming language developed by ____.
a.   Microsoft   c.   Oracle
b.   IBM   d.   Sun Microsystems

____ 13. A(n) ____ is software that attaches itself to another program and can cause damage when the host program is activated.
a.   applet   c.   virus
b.   cookie   d.   message digest

_____ 14. A(n) _____ is a type of virus that replicates itself on computers that it infects.
      a.   worm   c.   session
      b.   cookie   d.   message digest

_____ 15. The term _____ describes the process of hiding information within another piece of information.
      a.   ACL   c.   firewall
      b.   steganography   d.   decryption

_____ 16. A(n) _____ allows anyone with knowledge of its existence to cause damage by observing transactions, deleting data, or stealing data.
      a.   sniffer   c.   auditor
      b.   backdoor   d.   opener

_____ 17. Protection of assets using non-physical means is called _____.
      a.   countermeasure   c.   secrecy policy
      b.   logical security   d.   continuity plan

_____ 18. Exploits that capture confidential customer information are called _____.
      a.   PGP   c.   warchalking
      b.   eavesdropping expeditions   d.   phishing expeditions

_____ 19. The purpose of a(n) _____ threat is to disrupt normal computer processing.
      a.   privacy   c.   secrecy
      b.   necessity   d.   integrity

_____ 20. _____ encryption encodes a message with one of several available algorithms that use a single numeric key to encode and decode data.
      a.   PGP   c.   Asymmetric
      b.   Symmetric   d.   AEC

Essay questions

21. How do ActiveX controls cause threats to electronic commerce?

22. How could a buffer in a web server cause security threats?

23. What are the six main elements included on a digital certificate?

24. Briefly describe the requirements for secure electronic commerce.

25. What is the difference between a virus and a worm?

Notes

11 Answers for multiple choice, true/false and essay questions

SUBJECT GUIDE CHAPTER 1
ANSWER SECTION

TRUE/FALSE

1. ANS: T
2. ANS: F
3. ANS: T
4. ANS: T
5. ANS: T
6. ANS: T
7. ANS: T
8. ANS: F
9. ANS: F
10. ANS: F

MULTIPLE CHOICE

11. ANS: B
12. ANS: A
13. ANS: A
14. ANS: D
15. ANS: D
16. ANS: B
17. ANS: A
18. ANS: B
19. ANS: A
20. ANS: C

ESSAY

Main points that need to be included are:

21. ANS:
The following business processes are well suited to electronic commerce:
Sale/purchase of books and CDs and other commodities, online delivery of software, sale/purchase of travel services, online shipment tracking, and sale/purchase of investment and insurance products.

22. ANS:
Transaction costs are the total of all costs that a buyer and a seller incur as they gather information and negotiate a purchase-sale transaction. Although brokerage fees and sales commissions can be a part of transaction costs, the cost of information search and acquisition is often far larger. Another significant component of transaction costs can be the investment a seller makes in equipment or in the hiring of skilled employees to supply the product or service to the buyer.

23. ANS:
For each business unit, the primary activities are as follows: 1) identify customers, 2) design, 3) purchase materials and supplies, 4) manufacture product or create service, 5) market and sell, 6) deliver, and 7) provide after-sale service and support. The support activities include: 1) finance and administration, 2) human resources, and 3) technology development.

24. ANS:
Strengths

What does the company do well?
Is the company strong in its market?
Does the company have a strong sense of purpose and the culture to support that purpose?

Weaknesses

What does the company do poorly?
What problems could be avoided?
Does the company have serious financial liabilities?

25. ANS:
Consumer shopping on the Web, often called business-to-consumer (or B2C).
Transactions conducted between businesses on the Web, often called business-to-business (or B2B)
Transactions and business processes that companies, governments, and other organizations undertake on the Internet to support selling and purchasing activities.

SUBJECT GUIDE CHAPTER 2
ANSWER SECTION

TRUE/FALSE

1. ANS: T
2. ANS: T
3. ANS: T
4. ANS: T
5. ANS: T
6. ANS: F
7. ANS: F
8. ANS: F
9. ANS: F
10. ANS: T

MULTIPLE CHOICE

11. ANS: D
12. ANS: C

13. ANS: B
14. ANS: D
15. ANS: C
16. ANS: A
17. ANS: A
18. ANS: B
19. ANS: B
20. ANS: C

ESSAY

Main points that need to be included are:

21. ANS:
The computers that decide how to best forward each packet are called routing computers, router computers, routers, gateway computers (because they act as the gateway from a LAN or WAN to the Internet) or border routers (because they are located at the border between the organization and the Internet.) The programs on the routers that determine the best path contain rules called routing algorithms. The programs apply these algorithms to information they have stored in routing tables or configuration tables. This information includes lists of connections that lead to particular groups of other routers, rules that specify which connection to use first, and rules for handling instances of heavy packet traffic and network congestion.

22. ANS:
The open architecture philosophy developed for the evolving ARPANET, which later became the core of the Internet, included the use of a common protocol for all computers connected to the Internet and four key rules for message handling: 1) Independent networks should not require any internal changes to be connected to the network, 2) Packets that do not arrive at their destinations must be retransmitted from their source network, 3) Router computers act as receive-and-forward devices; they do not retain information about the packets that they handle, and 4) No global control exists over the network.

23. ANS:
The TCP controls the disassembly of a message or a file into packets before it is transmitted over the Internet, and it controls the reassembly of those packets into their original formats when they reach their destinations. The IP specifies the addressing details for each packet, labeling each with the packet's origination and destination addresses.

24. ANS:
A public network is any computer network or telecommunications network that is available to the public. The Internet is one example of a public network. A private network is a private, leased-line connection between two companies that physically connects their intranets to one another.

25. ANS:
One major advantage of Bluetooth technology is that it consumes very little power, which is an important consideration for mobile devices. Another advantage is that Bluetooth devices can discover each other and exchange information automatically. For example, a person using a laptop computer in a temporary office can print to a local Bluetooth-enabled printer without logging in to the network or installing software in either device. The printer and laptop computer electronically recognize each other as Bluetooth devices and immediately can begin exchanging information.

SUBJECT GUIDE CHAPTER 3
ANSWER SECTION

TRUE/FALSE

1. ANS: F
2. ANS: F
3. ANS: F
4. ANS: T
5. ANS: F
6. ANS: F
7. ANS: T
8. ANS: F
9. ANS: F
10. ANS: F

MULTIPLE CHOICE

11. ANS: B
12. ANS: C
13. ANS: A
14. ANS: A
15. ANS: D
16. ANS: B
17. ANS: A
18. ANS: D
19. ANS: D
20. ANS: B

ESSAY

Main points that need to be included are:

21. ANS:
1) Attracting visitors to the Web site, 2) Making the site interesting enough that visitors stay and explore, 3) Convincing visitors to follow the site's links to obtain information, 4) Creating an impression consistent with the organization's desired image, 5) Building a trusting relationship with visitors, 6) Reinforcing positive images that the visitor might already have about the organization, and 7) Encouraging visitors to return to the site.

22. ANS:
Visitors arrive for many different reasons, including these: 1) Learning about products or services that the company offers, 2) Buying products or services that the company offers, 3) Obtaining information about warranty, service, or repair policies for products they purchased, 4) Obtaining general information about the company or organization, 5) Obtaining financial information for making an investment or credit granting decision, 6) Identifying the people who manage the company or organization, or 7) Obtaining contact information for a person or department in the organization.

23. ANS:
To be successful in conveying an integrated image and offering information to potential customers, businesses should try to meet the following goals when construction their Web sites: 1) Offer easily accessible facts about the organization, 2) Allow visitors to experience the site in different ways and at different levels, 3) Provide visitors with meaningful, two-way (interactive) communication link with the organization, 4) Sustain visitor attention and encourage return visits, and 5) Offer easily accessible information about products and services and how to use them.

24. ANS:
The guidelines include:

Design the site around how the visitors will navigate the links, not around the company's organizational structure.
Allow visitors to access information quickly.
Avoid using inflated marketing statements in product or service descriptions.
Avoid using business jargon and terms that visitors might not understand.
Build the site to work for visitors who are using the oldest browser software connection.
Be consistent in use of design features and colors.
Make sure that navigation controls are clearly labeled or otherwise recognizable.
Test text visibility on smaller monitors.
Check to make sure that color combinations do not impair viewing clarity for color-blind visitors.
Conduct usability tests by having potential site users navigate through several versions of the site.

25. ANS:
In the personal contact model, the firm's employees individually search for, qualify, and contact potential customers. In the mass media approach, firms prepare advertising and promotional materials about the firm and its products or services. They then deliver these messages to potential customers by broadcasting them on television or radio, printing them in newspapers or magazines, posting them on highway billboards, or mailing them.

SUBJECT GUIDE CHAPTER 4
ANSWER SECTION

TRUE/FALSE

1. ANS: T
2. ANS: F
3. ANS: F
4. ANS: F
5. ANS: T
6. ANS: F
7. ANS: F
8. ANS: F
9. ANS: T
10. ANS: T

MULTIPLE CHOICE

11. ANS: C
12. ANS: A
13. ANS: A

14. ANS: A
15. ANS: A
16. ANS: D
17. ANS: A
18. ANS: C
19. ANS: A
20. ANS: D

ESSAY

Main points that need to be included are:

21. ANS:
When customers are likely to buy items from particular product categories, or are likely to think of their needs in terms of product categories, this type of product-based organization makes sense.

22. ANS:
Technology-enabled relationship management occurs when a firm obtains detailed information about a customer's behavior, preferences, needs, and buying patterns, *and* uses that information to set prices, negotiate terms, tailor promotions, add product features, and otherwise customize its entire relationship with that customer.

23. ANS:
For years, Digital Equipment Corporation (DEC) was a leading manufacturer of midrange computers. When the market for computing shifted to personal computers, DEC found that its branding did not transfer to the personal computers that it produced. The consumers in that market did not see the same perceived value or differentiation in DEC's personal computers that the buyers of midrange computers had seen for years.

24. ANS:
Simplifiers want ease of access and end-to-end convenience. They like readily available information, reliable customer service and easy returns. They respond well to advertising suggesting that it is easier or faster to do business on line rather than in traditional methods. However they dislike unsolicited e-mail and pop up windows and other features that they see as complicating their on-line business.
Surfers use the internet for many reasons including exploring, shopping, finding information and entertainment. They move quickly among sites and are continually seeking new online experiences.
Connectors use the internet mainly to relate to other people.
Sportsters use the internet for content on sports and entertainment sites.

25. ANS:
The first is to use a banner exchange network. The second way is to find websites that appeal to one of the company's market segments and then pay those sites to carry the ads. A third way is to use a banner-advertising network.

SUBJECT GUIDE CHAPTER 5
ANSWER SECTION

TRUE/FALSE

1. ANS: T
2. ANS: T
3. ANS: T

4. ANS: T
5. ANS: F
6. ANS: T
7. ANS: F
8. ANS: F
9. ANS: T
10. ANS: T

MULTIPLE CHOICE

11. ANS: B
12. ANS: D
13. ANS: B
14. ANS: A
15. ANS: A
16. ANS: A
17. ANS: B
18. ANS: A
19. ANS: D
20. ANS: A

ESSAY

Main points that need to be included are:

21. ANS:
Purchasing activities include identifying vendors, evaluating vendors, selecting specific products, placing orders, and resolving any issues that arise after receiving the ordered goods or services.

Procurement generally includes all purchasing activities, plus the monitoring of all elements of purchase transactions. It also includes the job of managing and developing relationships with key suppliers.

22. ANS:
Direct connection requires each business in the network to operate its own on-site EDI translator computer. These EDI translator computers are then connected directly to each other using modems and dial-up telephone lines or dedicated leased lines.

With an indirect connection, the trading partners pass messages through the VAN instead of connecting their computer directly to each other.

23. ANS:
Suppliers can:

Share information about customer demand fluctuations.
Receive rapid notification of product design changes and adjustments.
Provide specifications and drawings more efficiently.
Increase the speed of processing transactions.
Reduce the cost of handling transactions.
Reduce errors in entering transaction data.
Share information about defect rates and types.

24. ANS:
Direct materials are those materials that become part of the finished product in a manufacturing process. Indirect materials are all other materials that the company purchases, including factory supplies such as sandpaper, hand tools, and replacement parts for manufacturing machinery.
25. ANS:
Advantages of using VANs are as follows:

Users need to support only the VAN's communications protocol instead of many possible protocols used by trading partners.
The VAN records message activity in an audit log. This VAN audit log becomes an independent record of transactions, and this record can be helpful in resolving disputes between trading partners.
The VAN can provide translation between different transaction sets used by trading partners.
The VAN can perform automatic compliance checking to ensure that the transaction set is in the specified EDI format.

SUBJECT GUIDE CHAPTER 6
ANSWER SECTION

TRUE/FALSE

1. ANS: T
2. ANS: F
3. ANS: T
4. ANS: F
5. ANS: F
6. ANS: T
7. ANS: T
8. ANS: T
9. ANS: T
10. ANS: T

MULTIPLE CHOICE

11. ANS: C
12. ANS: B
13. ANS: C
14. ANS: A
15. ANS: D
16. ANS: B
17. ANS: B
18. ANS: B
19. ANS: D
20. ANS: C

ESSAY

Main points that need to be included are:

21. ANS:
    In an English auction, bidders publicly announce their successive higher bids until no higher bid is forthcoming. At that point, the auctioneer pronounces the item sold to the highest bidder at that bidder's price. The Dutch auction is a form of open auction in which bidding starts at a high price and drops until a bidder accepts the price.

22. ANS:
    In an auction, a seller offers an item or items for sale, but does not establish a price. This is called "putting an item up for bid" or "putting an item on the (auction) block." Potential buyers are given information about the item or some opportunity to examine it; they then offer bids, which are the prices they are willing to pay for the item. The potential buyers, or bidders, each have developed private valuations, or amounts they are willing to pay for the item. The whole auction process is managed by an auctioneer.

23. ANS:
    Supply chain characteristics that support reverse auctions are:
    Suppliers are highly competitive
    Product features can be clearly specified
    Suppliers are willing to reduce the margin they earn on this product
    Suppliers are willing to participate in reverse auctions

24. ANS:
    The main difference between eBay and a live English auction is that bidders do not know who placed which bid until the auction is over. The eBay English auction also allows sellers to specify that an auction be made private. In an eBay private auction, the site never discloses bidders identities and the prices they bid. At the conclusion of the auction, eBay notifies only the seller and the highest bidder. Another auction type offered by eBay is an increasing-price format for multiple-item auctions that eBay calls a Dutch auction.

25. ANS:
    In a proxy bid, the bidder specifies a maximum bid. If that maximum bid exceeds the current bid, the eBay site automatically enters a bid that is one minimum bid increment higher than the current bid. As new bidders enter the auction, the eBay site software continually enters higher bids for all bidders who placed proxy bids.

SUBJECT GUIDE CHAPTER 7
ANSWER SECTION

TRUE/FALSE

1.   ANS: F
2.   ANS: T
3.   ANS: F
4.   ANS: T
5.   ANS: F
6.   ANS: T
7.   ANS: T
8.   ANS: T
9.   ANS: T
10.   ANS: F

MULTIPLE CHOICE

11.   ANS: B
12.   ANS: C
13.   ANS: C
14.   ANS: C
15.   ANS: A
16.   ANS: B
17.   ANS: B
18.   ANS: A
19.   ANS: D
20.   ANS: D

ESSAY

Main points that need to be included are:

21.   ANS:
A contract is a promise or set of promises between two or more legal entities—persons or corporations—that provides for an exchange of value (goods, services, or money) between or among them. A tort is an intentional or negligent action taken by a legal entity that causes harm to another legal entity.

22.   ANS:
These principles are as follows:
Use the data collected to provide improved customer service.
Do not share customer data with others outside your company without the customer's permission.
Tell customers what data you are collecting and what you are doing with it.
Give customers the right to have you delete any of the data you have collected about them.

23.   ANS:
The store offers an item at a stated price.
The consumer accepts this offer by indicating a willingness to buy the product for a stated price.

The store exchanges its product for another valuable item: the consumer's payment.

24.   ANS:

Subject-matter jurisdiction is a court's authority to decide a particular type of dispute. For example, in the United States, federal courts have subject-matter jurisdiction over issues governed by federal law (such as bankruptcy, copyright, patent, and federal tax matters), and state courts have subject-matter jurisdiction over issues governed by state laws (such as professional licensing and state tax matters). If the parties to a contract are both located in the same state, a state court has subject-matter jurisdiction over disputes that arise from the terms of that contract.

Personal jurisdiction is, in general, determined by the residence of the parties. A court has personal jurisdiction over a case if the defendant is a resident of the state in which the court is located.

25.   ANS:

The store offers an item at a stated price.
The consumer accepts this offer by indicating a willingness to buy the product for the stated price.
The store exchanges its product for another valuable item: the consumer's payment.

SUBJECT GUIDE CHAPTER 8
ANSWER SECTION

TRUE/FALSE

1.	ANS:	F
2.	ANS:	T
3.	ANS:	F
4.	ANS:	T
5.	ANS:	T
6.	ANS:	T
7.	ANS:	F
8.	ANS:	T
9.	ANS:	F
10.	ANS:	T

MULTIPLE CHOICE

11.	ANS:	B
12.	ANS:	C
13.	ANS:	B
14.	ANS:	A
15.	ANS:	C
16.	ANS:	C
17.	ANS:	B
18.	ANS:	D
19.	ANS:	D
20.	ANS:	B

ESSAY

Main points that need to be included are:

21.   ANS:
Two factors to evaluate when measuring a server's Web page delivery capability are throughput and response time. Throughput is the number of HTTP requests that a particular hardware and software combination can process in a unit of time. Response time is the amount of time a server requires to process one request.

22.   ANS:
A program called Ping, short for Packet Internet Groper, tests the connectivity between two computers connected to the Internet. Ping provides performance data about the connection between Internet computers, such as the number of computers (hops) between them. It sends two packets to the specified address and waits for a reply. Network technicians often use Ping to troubleshoot Internet connections.

23.   ANS:
Types of sites include:

Development sites: Simple sites that companies use to evaluate different Web designs with little initial investment. A development site can reside on an existing PC running Web server software. Multiple testers access the site through their client computers on an existing LAN.

Intranets: Corporate networks that house internal memos, corporate policy handbooks, expense account worksheets, budgets, newsletters, and a variety of other corporate documents.

Extranets: Intranets that allow certain authorized parties outside the company (such as suppliers or strategic partners) to access certain parts of the information stored in the system.

Transaction-processing sites: Commerce sites such as business-to-business and business-to-consumer electronic commerce sites that must be available 24 hours a day, seven days a week. These sites must have spare server computers for handling high traffic volumes that occur periodically. In addition to requiring fast and reliable hardware, transaction-processing sites must run Web and commerce software that is efficient and easily upgraded when site traffic increases.

Content-delivery sites: Sites that deliver content such as news, histories, summaries, and other digital information. Visitors must be able to locate articles quickly with a fast and precise search engine. The content must be presented rapidly on the visitor's screen. In general, these sites must be available 24 hours a day, seven days a week, just like transaction-processing sites. Hardware requirements for content sites are also similar to those of transaction-processing commerce sites.

24.   ANS:
A typical request message from a client to a server consists of three major parts: request line, optional request headers, and the optional entity body. The request line contains a command, the name of the target resource (a filename and a description of the path to that file on the server), and the protocol name and version number. Optional request headers can contain information about the types of files that the client will accept in response to this request. Finally, an optional entity body is sometimes used to pass bulk information to the server.

25.   ANS:

One annoyance associated with e-mail is the amount of time that businesspeople spend answering their e-mail today. Researchers have found that most managers can deal with e-mail messages at an average rate of about five minutes per message. Some messages can be deleted within a few seconds, but those are balanced by the e-mails that require the manager to spend much more time finding facts, checking files, making phone calls, and doing other tasks as part of answering e-mail.

A second major irritation brought by e-mail is the computer virus, more simply known as a virus, which is a program that attaches itself to another program and can cause damage when the host program is activated.

Probably the most frustrating and expensive problem associated with e-mail today is the issue of unsolicited commercial e-mail.

SUBJECT GUIDE CHAPTER 9
ANSWER SECTION

TRUE/FALSE

1.	ANS:	T
2.	ANS:	F
3.	ANS:	F
4.	ANS:	F
5.	ANS:	F
6.	ANS:	T
7.	ANS:	F
8.	ANS:	T
9.	ANS:	T
10.	ANS:	F

MULTIPLE CHOICE

11.	ANS:	C
12.	ANS:	A
13.	ANS:	B
14.	ANS:	A
15.	ANS:	A
16.	ANS:	A
17.	ANS:	B
18.	ANS:	A
19.	ANS:	A
20.	ANS:	B

ESSAY

Main points that need to be included are:

21.   ANS:
Larger and more complex electronic commerce sites also use software that adds other features and capabilities to the basic set of commerce tools. These additional software components can include:
. Middleware that integrates the electronic commerce system with existing company information systems that handle inventory control, order processing, and accounting
. Enterprise application integration
. Web services
. Integration with enterprise resource planning (ERP) software
. Supply chain management (SCM) software
. Customer relationship management (CRM) software
. Content management software
. Knowledge management software

22.   ANS:
A static catalog is a simple list written in HTML that appears on a Web page or a series of Web pages. To add an item, delete an item, or change an item's listing, the company must edit the HTML of one or more pages. A dynamic catalog stores the information about items in a database, usually on a separate computer that is accessible to the server that is running the Web site itself. A dynamic catalog can feature multiple photos of each item, detailed descriptions, and a search tool that allows customers to search for an item and determine its availability.

23.   ANS:
Supply chain management (SCM) software helps companies to coordinate planning and operations with their partners in the industry supply chains of which they are members. SCM software performs two general types of functions: planning and execution.

24.   ANS:
Mall-style CSPs provide shopping cart software or the ability to use another vendor's shopping cart software. They also furnish customer payment processing so that customers can choose to purchase their goods and services with a credit card or other form of payment. The CSP processes the acceptance and authorization of credit cards on behalf of the merchant. Another benefit is that because they are paying a monthly fee to the CSP, sites do not have to display any Web banners, which can be unattractive and distracting. The fourth benefit of the mall-style CSPs is that they provide higher-quality Web store building and maintenance tools than do the basic CSPs.

25.   ANS:
Shared hosting means that the client's Web site is on a server that hosts other Web sites simultaneously and is operated by the service provider at its location. With dedicated hosting, the service provider makes a Web server available to the client, but the client does not share the server with other clients of the service provider.

SUBJECT GUIDE CHAPTER 10
ANSWER SECTION

TRUE/FALSE

          1.   ANS: T
          2.   ANS: F

3.	ANS: F
4.	ANS: F
5.	ANS: T
6.	ANS: T
7.	ANS: F
8.	ANS: F
9.	ANS: F
10.	ANS: T

MULTIPLE CHOICE

11.	ANS: B
12.	ANS: D
13.	ANS: C
14.	ANS: A
15.	ANS: B
16.	ANS: B
17.	ANS: B
18.	ANS: D
19.	ANS: B
20.	ANS: B

ESSAY

Main points that need to be included are:

21.   ANS:
The security danger with ActiveX controls is that once they are downloaded, they execute like any other program on a client computer. They have full access to all system resources, including operating system code. An ill-intentioned ActiveX control could reformat a user's hard disk, rename or delete files, send e-mails to all the people listed in the user's address book, or simply shut down the computer. Because ActiveX controls have full access to client computers, they can cause secrecy, integrity, or necessity violations.

22.   ANS:
A buffer is an area of memory set aside to hold data read from a file or database. A buffer is necessary whenever any input or output operation takes place because a computer can process file information much faster than the information can be read from input devices or written to output devices. Programs filling buffers can malfunction and overfill the buffer, spilling the excess data outside the designated buffer memory area. This is called a buffer overrun or buffer overflow error. Usually, this occurs because the program contains an error or bug that causes the overflow.

23.   ANS:
Digital certificates cannot be forged easily. A digital certificate includes six main elements, including: 1) Certificate owner's identifying information; 2) Certificate owner's public key; 3) Dates between which the certificate is valid; 4) Serial number of the certificate; 5) Name of the certificate issuer; and 6) Digital signature of the certificate issuer.

24.   ANS:
Secrecy: Prevent unauthorized persons from reading messages and business plans, obtaining credit card numbers, or deriving other confidential information.
Integrity: Enclose information in a digital envelope so that the computer can automatically detect messages that have been altered in transit.

Availability: Provide delivery assurance for each message segment so that messages or message segments cannot be lost undetectably.

Key management: Provide secure distribution and management of keys needed to provide secure communications.

Nonrepudiation: Provide undeniable, end-to-end proof of each message's origin and recipient.

Authentication: Securely identify clients and servers with digital signatures and certificates.

25.   ANS:

A virus is software that attaches itself to another program and can cause damage when the host program is activated. A worm is a type of virus that replicates itself on the computers that it infects. Worms can spread quickly through the Internet.

Notes

Notes

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