UNIT-IV

MULTIMEDIA AND WEB APPLICATION

4.1 MULTIMEDIA IN WEB DESIGN

A few years back, the typical desktop computer's power, although considered substantial at the time, made it impossible to think of integrating high-quality audio and video into applications. Today's computers typically include CD-ROMs, sound cards and other hardware and special software which have make computer multimedia a reality.

Economical desktop machines are so powerful that they can store and play DVDquality sound and video and we expect to see a huge advance in the kinds of programmable multimedia capabilities available through programming languages.

The multimedia revolution occurred first on the desktop computer, with the widespread availability of CD-ROMs. This platform is rapidly evolving towards DVD technology, but our focus in this chapter is on the explosion of sound and video technology that appears on the World Wide Web. In general, we expect the desktop to lead with the technology, because the Web is so dependent on bandwidth, and, for the foreseeable future, Internet bandwidths for the masses are likely to lag considerably behind those available on the desktop. One thing that Deitel has learned—having been in this industry for nearly four decades now—is to plan for the impossible. In the computer and communications a field, the impossible has repeatedly become reality so many times that it is almost routine at this point.

We discuss how to add sound, video and animated characters to Web based applications. Your first reaction may be a sense of caution because you realize that these are complex technologies and most readers have had little if any education in these areas. This is one of the beauties of today's programming languages. They give the programmer easy access to complex technologies and hide most of the complexity.

Multimedia files can be quite large. Some multimedia technologies require that the complete multimedia file be downloaded to the client before the audio or video begins playing. With streaming technologies, audio and video can begin playing while the files are downloading, to reduce delays. Streaming technologies are becoming increasingly popular.

Creating audio and video to incorporate into Web pages often requires complex and powerful software such as Adobe[™] After Effects or Macromedia[™] Director. Rather than discuss how to create media clips, this chapter focuses on using existing audio and video clips to enhance Web pages. The chapter also includes an extensive set of Internet and World Wide Web resources. Some of these Web sites display examples of interesting multimedia enhancements; others provide instructional information for developers planning to enhance their own sites with multimedia.

4.2 AUDIO AND VIDEO SPEECH SYNTHESIS AND RECOGNITION

Audio and Video:

 Audio and video can be used in Web pages in a variety of ways. Audio and video files can be embedded in a Web page or placed on a Web server such that they can be downloaded "on-demand." A variety of audio and video file formats are available for different uses.

 Common video file formats include MPEG (Moving Pictures Experts Group), Quick- Time, RealPlayer, AVI (Video for Windows) and MJPEG (Motion JPEG). Audio formats include MP3 (MPEG Layer 3), MIDI (Musical Instrument Digital Interface), WAV (Windows Waveform) and AIFF (Audio Interchange File Format— Macintosh only).

Encoding and compression determine a file's format. An **encoding algorithm** or CODEC compresses media files by taking the raw audio or video and transforming it into a format that Web pages can read. Different encoding levels and formats produce file sizes that are ideal for different applications.

Some CODECs are available to the public in the form of **encoding applications**. Most encoding applications compress audio and video files. Some serve as **format converters**, converting one file format into another.

Adding Background Sounds with the bgsound Element:

- Some Web sites provide background audio to create a particular "atmosphere" on the site. Various ways exist to add sound to a Web page, the simplest is the bgsound element. The src property specifies the URL of the audio clip to play. Internet Explorer supports a wide variety of audio formats.
- The loop property specifies the number of times the audio clip will play. The value -1 (the default) specifies that the audio clip should loop until users browse a different Web page or click the browser's Stop button. A positive integer indicates the exact number of times the audio clip should loop. Negative values (except -1) and zero values for this property cause the audio clip to play once.
- The balance property specifies the balance between the left and right speakers. The value for this property is between -10000 (sound only from the left speaker) and 10000 (sound only from the right speaker). The default value, 0, indicates that the sound should be balanced between the two speakers.
- The XHTML document of Fig demonstrates the bgsound element and scripting the element's properties. This example's audio clip came from the Microsoft Developer Network's downloads site, msdn.microsoft.com/downloads/default.asp

Adding Video with the img Element's dynsrc Property:

Users can tremendously enhance the multimedia presentations by incorporating a variety of video formats into their Web pages. The img element incorporates both images and videos in a Web page. The src property, shown previously, indicates that the source is an image. The dynsrc (i.e., dynamic source) property indicates that the source is a video clip. The dynsrc property may have other properties such as loop, which is similar to the bgsound loop property. The XHTML document of demonstrates the img element and its dynsrc property.

```
<?xml version = "1.0"?>
```

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"

```
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- Fig: Dynamicimg.html -->
<!-- Demonstrating the img element's dynsrc property -->
<html xmlns = "http://www.w3.org/1999/xhtml">
<head>
      <title>An Embedded Video Using the dynsrc Property</title>
      <bgsound src = "http://msdn.microsoft.com/downloads/sounds/carib.MID"</pre>
      loop = "-1"></bgsound>
</head>
<body>
      <h1>An Embedded Video Using the img element's dynsrc Property</h1>
      <h2>Car and Carribean Music</h2>
  <timg dynsrc = "car hi.wmv"start = "mouseover" width =
      "180"height = "135"
            loop = "-"alt = "Car driving in circles" />
            This page will play the audio clip and video in a loop.<br />
            The video will not begin playing until you move the mouse over the
      video.<br/>
                   <strong>Stop</strong> to stop playing the sound and the
            Press
      video.
            </body>
</html>
```

Output:



 The img element in lines 21–24 uses the dynsrc property to load and display the video car_hi.wmv. Property start specifies when the video should start playing. There are two possible start events—fileopen indicates that the video should play
as soon as it loads into the browser, and mouseover indicates that the video
should play when users first position the mouse over the video.

Adding Audio or Video with the embed Element:

- Previously, we used elements bgsound and img to embed audio and video in a Web page. In both cases, users of the page have little control over the media clip. In this section, we introduce the *embed* element, which embeds a media clip (audio or video) into a Web page. The embed element displays a graphical user interface that gives users direct control over the media clip. When the browser encounters a media clip in an embed element, the browser plays the clip with the player registered to handle that media type on the client computer. For example, if the media clip is a wave file (i.e., a Windows Wave file), Internet Explorer typically uses the Windows Media Player ActiveX control to play the clip.
- The Windows Media Player has a GUI that enables users to play, pause and stop the media clip. Users can also control the volume of audio and move forward and backward through the clip using the GUI.
- The embed element is supported by both Microsoft Internet Explorer and Netscape navigator; however it is not part of the XHTML 1.0 recommendation. Documents written in XHTML using the embed element should render properly in either browser, however, errors may occur when trying to validate the document using the World Wide Web Consortium's XHTML 1.0 validator.
- The XHTML document of fig modifies the wave filter example by using an embed element to add audio to the Web page.
- Line 58 uses the embed element to specify that the audio file humming.wav should be embedded in the Web page. The loop property indicates that the media clip should loop indefinitely. The width and height properties define the size of the controls for the sound clip. By default, the GUI for the media player is displayed. To prevent the GUI from appearing in the Web page, add the hidden property to the <embed> element. To script the element, specify a scripting name by adding the id property to the <embed> element. The embed> element can specify video clips as well as audio clips.

Demonstrates an embedded video:

The embed element that loads and plays the video is located in line 18.

<?xml version = "1.0"?> <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"> <!-- Fig: EmbeddedAudio.html1-transitional.dtd"> <!-- Fig: EmbeddedAudio.html --> <!-- Background Audio via the embed Element --> <html xmlns = "http://www.w3.org/1999/xhtml"> <head> <title>Background Audio via the embed Element</title> <style type = "text/css"> span { width: 600 }

```
.big { color: blue; font-family: sans-serif;15 font-size: 50pt;16 font-
            weight: bold }
            </style>
            <script type = "text/javascript">
                  <!--
                  var TimerID;
                  var updown = true;
                  var str = 1;
                  function start()
                  {
                         TimerID = window.setInterval( "wave()", 100 );
                   }
                   function wave()
                  {
                         if ( str > 20 || str < 1 )
                               updown = !updown;
                         if (updown)
                               str++;
                         else
                               str--:
                         wft.filters( "wave" ).phase = str * 30;
                         wft.filters( "wave" ).strength = str;
                  }
                   // -->
            </script>
      </head>
<body onload = "start()">
      <h1>Background Audio via the embed Element</h1>
      Click the text to stop the script.
      <span onclick = "window.clearInterval( TimerID )"
            id = "wft" style = "filter:wave( add = 0, freq = 3, light = 0, phase = 0,
     strength = 5)">
            WAVE FILTER EFFECT
     </span>
      These controls can be used to control the audio.
      <embed src = "humming.wav" loop = "true"></embed>
</body>
```

```
</html>
```

Embedding audio with the embed element:



Player obj	jects	Wieura
	Use the controls below to control the audio slip	0 [
Pouse Video		
] Done		My Computer

4.3 ELECTRONIC COMMERCE

Any web site that offers products and/or services for sale is a commercial web site. There are thousands of commercial web sites on the Internet. Some of them have been successful, and some weren't so lucky. What elements make up a good commercial web site? Of course, web pages should look attractive to a customer. However, even the most attractive web pages will not make a person come back to a web site where it takes too long to find the right product or where order forms don't work. In this lecture we will discuss what functionality is needed for a successful commercial web site and what technology implements various web site elements.

Examples of commercial web sites

Let's browse the following two web sites, which are fairly typical web sites for online shopping.

- Online bakery. A web site for a small business.
- Trains.com Online store of model trains and related products. An example of a larger commercial web site.

Components of a well-functioning commercial web site

A well-organized web site should be easy for a customer to use and easy for the owner to maintain. It takes a lot to build a well-organized web site. Below is a list of the most important elements that a good web site should have:

- A well-organized collection of products and/or services. Smaller web sites can just list all their products on one or several web pages. Larger sites provide indices of products and search engines so that customers can find what they need. There should be a way for customers to get all necessary information about products, compare several products, get an advice on related products that they might want to get, etc.
 - To maintain a web site, the owner should be able to change product information easily. A web site where a price change of a single product requires changing 3 web pages is just bound to have inconsistencies. The owner should be able to add or remove products based on every day's availability, change prices, add product cross-references, etc. without making the web site inconsistent even for a minute.
- A convenient way for a customer to select products. Usually implemented as a shopping cart or a shopping basket. The customer should be able to select and delete products while browsing the web site.
- **Convenient order forms.** The form should be flexible enough to allow specifying a different address for the product delivery, a gift message, etc. It should have as few required fields as possible. A returning customer should be provided default information so that not to type it every time. For both the customer and the owner it is essential that the form catches simple typos (s.a. 4 digits in a zip code).
- **Convenient ways of payment.** There should be options of paying by a credit card, by a check (not everyone has credit cards!), and by a credit card over the phone if the customer is not comfortable sending his/her credit card number. The options may include some electronic payment systems. For the owner, there should be a quick way to verify the credit card information or in some other way to check that the payment is valid.
- Secure communication system not only to protect transmission of a credit card number, but also to guarantee privacy of the customer (including details of the purchase). A web site might have a user registration system with a password, in which case all transactions by the user should be private. It is also important to prevent unauthorized access to the web site (by a hacker or accidental).
- Some way of storing information about customers. This is convenient for customers so that they don't need to reenter their information every time they access the site. It also allows to "customizing" the web site for someone's interests. This can be done via customer registration or by means of "cookies", The owner can benefit a lot from storing information about a customer: he/she can customize ads based on the customer's profile or send an e-mail advertising a new product (but keep in mind that many people don't like this!) However, the greatest benefit is the owner's ability to monitor customer's behavior: which pages have the customer visited and which purchases (if any) he/she have made afterwards.
- A way of keeping information about orders. This allows customers to track their orders, and for owners to get all kinds of financial and statistical information. It is also important to keep order information in case of later disputes.
- The last, but not the least, **customer support and feedback**. There should be online documentation for all products ever sold on the web site, various FAQs,

and, ideally, a way of customers to post their opinion about the product. Easy access to this information may make a difference between a frequently visited web site and a lonely online looser. This aspect of a web site cannot be completely mechanized: a human being has to answer e-mail, judge the relevance of customer's comments and organize comments by topics, and so on. However, there is a lot that can be computer-aided in this process, for instance sorting incoming messages by their title and/or return address to forward them to an appropriate customer support person.

We are only considering business-to-customer interactions here (so-called **B2C**), leaving out all the features related to business-to-business (**B2B**) interactions. While such interactions are basically similar to B2C, they can be optimized if a company has stable business partners which have more powerful computers than an average customer does. Even a customer oriented web site has a B2B part when dealing with vendors of products. We are not considering B2B connections in designing a web site.

Some technologies used to implement all this

- Convenient storage and retrieval of information about products and customers require a **database**.
- **Some terminology:** A database is a collection of data organized in such a way that it can be easily accessed, managed, and updated. A query is a request to a database written in a form that's supported by the database. Every brand of databases has its own language of queries (a query language).
- A well-organized database allows you to store each piece of information only once, so if you need to change it, you change it in one place. Databases allow you to store information about orders, needed both for you and for customers. For instance, customers can track their orders by requesting information from the database, which will automatically reply whether the order has been shipped. You can use customer information to fill in forms for returning customers with their recorded information.
- You can store statistics about customers (how many times they have visited the web sites, which pages, what did they buy, and so on). Customer's feedback about products can be organized and displayed later when someone else is interested in the same product. It's hard to imagine an interesting web site that does not have a database behind it. There are various kinds of databases, from a simple one, which is a collection of "flat" files storing data, to very sophisticated commercial products, s.a. ORACLE. The most common kind is a relational database.
- A relational database is a database organized as a collection of tables.
- A convenient interface to the database from the web site. A customer does not need to know anything even about the existence of the database, not to mention details of its organization. He/she should be able to get all necessary information by typing in keywords and filling in electronic forms.
- Various programming languages (for instance, Java, JavaScript) provide libraries to implement a remote connection to a database server.

- A server is a computer that provides a remote access to some service, for instance a web page server "serves" web pages, i.e. sends HTML files, graphics files, etc. in response to http requests, a database server provides responses to database queries, and so on. One machine can provide several different services at the same time.
- A client is a computer that makes a request for a service.
- We will use a Java JDBC (Java Database Connectivity) package to facilitate a connection to a relational database. It does not depend on a particular kind of the database, as long as the database supports SQL (Structured Query Language).
- SQL is a standard for a query language of a relational database.
- An interface has to provide way for customers to fill in forms, press buttons, etc. We will use javax.swing package to build an interactive graphical interface.
- We need to be able to process user's forms, for instance order forms, and produce various web pages, depending on the request. Ways of processing electronic forms include various server-side scripts, s.a. CGI, PERL, asp (Active Server Pages, an extension of JavaScript) and others. We will use Java Servlets for this purpose.
- A web site responds to requests for web pages. It doesn't "know" where the requests have come from, so it can't tell if two requests for web pages have been made by the same user. To keep track of a user during a session (and sometimes between sessions), a web server uses **cookies**.
- A cookie is a small text file placed by a web server on the client machine. The file gets sent back every time the client requests a web page from the server. A cookie has an expiration time, which may be just for the session or longer.
- Java Servlet package also implements cookies.
- Encryption and security. A common way secure communications are implemented is via SSL (Secure Sockets Layer), which allows various forms of encryption, depending on the maximum level of encryption provided by the server and the client and on geographic location of the machines (a different level of encryption is allowed in the US for connections to domestic and foreign computers). We will study and compare several encryption algorithms. On the practical side, we will use Java packages which implement encryption and secure communications.
- Electronic payment systems are based on customer's accounts with one of trusted vendors. A customer obtains certificates "signed" by the vendor which are analogous to checks ("personal money") and cash ("anonymous money"). The implementation should be such that mere copying of any piece of information transmitted in the transaction does not allow the thief to use the "money". We will study protocols for verifying validity of "checks" and "cash" in electronic transactions. We will also study ways of implementing "coins" on the Internet, i.e. certificates for small amounts of money.

4.4 E-BUSINESS model

Learning Objectives

- Identify the key components of e-commerce business models.
- Describe the major B2C business models.
- Describe the major B2B business models.
- Recognize business models in other emerging areas of e-commerce.
- Understand key business concepts and strategies applicable to e-commerce.

Components of e-Business Models



Fig 4.1 E-Business Model

Price Competition

- Price for books and CDs sold on the Internet less than conventional channel.
 - Average 9-16%
- Price increments
 - Price change on the Internet is smaller than conventional channel.
- Price dispersion
 - Substantial differences in price across retailers on the Internet.
 - Heterogeneity in consumer awareness
 - Heterogeneity in retailer branding and trust

E-Commerce Business Models

- Business model
 - a set of planned activities designed to result in a profit in a marketplace.
- E-commerce business model
 - a business model that aims to use and leverage the unique qualities of the Internet and the World Wide Web.

Value Position

- Defines how a company's product or service fulfills the needs of customers.
- Questions
 - Why will customers choose to do business with your firm instead of another company?
 - What will your firm provide that other firms do not and cannot?

Revenue Model

- Describes how the firm will earn revenue, produce profits, and produce a superior return on invested capital.
- E-commerce revenue models include:
 - advertising model
 - subscription model
 - transaction fee model
 - sales model
 - affiliate model
- Advertising revenue model
 - a company provides a forum for advertisements and receives fees from advertisers (Yahoo).
- Subscription revenue model
 - a company offers it users content or services and charges a subscription fee for access to some or all of it offerings (Consumer Reports or Wall Street Journal).
- Transaction fee revenue model
 - a company receives a fee for enabling or executing a transaction (eBay or E-Trade).
- Sales revenue model
 - a company derives revenue by selling goods, information, or services (Amazon or DoubleClick).
- Affiliate revenue model
- a company steers business to an affiliate and receives a referral fee or percentage of the revenue from any resulting sales (MyPoints).

Market Opportunity

- Market opportunity
 - refers to the company's intended market space and the overall potential financial opportunities available to the firm in that market space.
 - defined by the revenue potential in each of the market niches where you hope to compete.
- Market space
 - the area of actual or potential commercial value in which a company intends to operate.

Competitive Environment

- Refers to the other companies operating in the same marketplace selling similar products.
- Influenced by:
 - how many competitors are active
 - how large are their operations
 - the market share of each competitor
 - o how profitable these firms are
 - how they price their products

Market Strategy

- The plan you put together that details exactly how you intend to enter a new market and attract new customers.
- Best business concepts will fail if not properly marketed to potential customers.

Organizational Development

- Describes how the company will organize the work that needs to be accomplished.
- Work is typically divided into functional departments.
- Move from generalists to specialists as the company grows.

Management Team

- Employees of the company responsible for making the business model work
- Strong management team gives instant credibility to outside investors
- A strong management team may not be able to salvage a weak business model
- Should be able to change the model and redefine the business as it becomes necessary

Portal

- offers powerful search tools plus an integrated package of content and services.
- typically utilizes a combines subscription/advertising revenues/transaction fee model may be general or specialize (portal).

E-tailer

- online version of traditional retailer
 - It includes
 - virtual merchants (online retail store only)
 - clicks and mortar e-tailers (online distribution channel for a company that also has physical stores)
 - o catalog merchants (online version of direct mail catalog)
 - online malls (online version of mall)
 - Manufacturers selling directly over the Web

Content Provider

- information and entertainment companies that provide digital content over the Web.
- typically utilizes an advertising, subscription, or affiliate referral fee revenue model.

Transaction Broker

 processes online sales transactions typically utilizes a transactions feel revenue model.

Market Creator

- uses Internet technology to create markets that bring buyers and sellers together.
- typically utilizes a transaction fee revenue model.
- E.g. Auction

- o English auction
- Dutch auction
- Sealed-bid auction
- Double auction

B2B Hub

 also known as marketplace/exchange electronic marketplace where suppliers and commercial purchasers can conduct transactions may be a general (horizontal marketplace) or specialized (vertical marketplace)

E-distributor

supplies products directly to individual businesses

B2B Service Provider

sells business services to other firms

Matchmaker

- links businesses together
- charges transaction or usage fees

Infomediary

gather information and sells it to businesses

4.5 E-MARKETING

- These 7 Cs e-marketing are fundamental to understanding the intricacies of Internet marketing and to transforming a venture from being a mere web presence to a highly successful e-venture. They are also instrumental in shaping the overall business strategy and the economic model that an organization needs to adopt.
- The value propositions of products and services offered in the physical world are essentially limited "point solutions" that meet only part of a consumer's need or want. In the online world, even a simple banner advertisement can be both an advertisement and a direct marketing service. The banner raises the passive consumer's awareness of a product. Yet it also encourages the consumer to pursue action by clicking on it.
- E-marketing must be defined to include the management of the consumer's online experience of the product, from first encounter through purchase to delivery and beyond. Digital marketers should care about the consumer's online experiences for the simple reason that all of them -- good, bad, or indifferent -- influence consumer perceptions of a product or a brand. The web offers companies' ownership and control of all interactions with customers and thus creates both the ability and the need to improve their overall experience.
- There are two reasons for building the concept of e-marketing around consumer experiences. First, this approach forces marketers to adopt the consumer's point of view. Second, it forces managers to pay attention to all aspects of their digital brand's interactions with the consumer, from the design of the product or service

to the marketing message, the sales and fulfillment processes, and the aftersales customer service effort.

The 7 Cs of E-Marketing

- The Internet allows for the entire sales cycle to be conducted on one medium, nearly instantaneously. From making the consumer aware of the product to providing additional information to transacting the final purchase, the Internet can accomplish it all.
- The Internet is like one big point-of-sales display, with easy access to products and the ability for impulse shopping. Impulse shoppers have found a true friend in the Internet. Within seconds from being made aware of a product, consumers can purchase it online. Further, with the targeting techniques available to advertisers, consumers who turn down a product because of the price can be identified and served a special offer more likely to result in a purchase. In the right hands, with the right tools, the Internet really is an advertiser's dream come true.



As opposed to the 4 Ps of brick-and-mortar marketing, the changing outlook in the area of e-marketing can be explained on the basis of 7 Cs of e-marketing.

- **Contract:** The e-marketer's first goal is to communicate a core promise for a truly distinctive value proposition appealing to the target customers.
- **Content:** refers to whatever appears on the website itself and on hot linked websites. If chosen appropriately, it can increase both the rates at which browsers are converted into buyers and their transactions.
- **Construction:** The promises made by e-marketers are not unique to the Internet, but the medium's interactive capabilities make it easier for them to deliver on their promises quickly, reliably, and rewardingly.
 - In practice, this means that promises must be translated into specific interactive functions and Web design features collectively giving

consumers a seamless experience. Such design features as one-click ordering and automated shopping help deliver the promise of convenience.

- **Community:** Through site-to-user and user-to-user forms of interactivity (such as chat rooms), e-marketers can develop a core of dedicated customers who become avid marketers of the site too.
- **Concentration:** Targeting through online behavioral profiling. Advertisers have known for some time that behavioral targeting (a.k.a., profiling) is vastly superior to simple demographic targeting. Knowledge of a consumer's past purchases interests, likes/dislikes, and behavior in general allows an advertiser to target an advertisement much more effectively. Department stores have long kept track of consumers' past purchases. They are thus able to project what other types of products a consumer might be interested in and then send an appropriate coupon or sale offer.
 - Credit card companies are the ultimate gatherers of behavioral targeting information. They maintain vast databases of cardholders' past transactions, and they sell lists of this data to advertisers. The same type of behavioral model is forming on the Internet. Publishers and advertisement networks monitor the items that a consumer has expressed interest in or purchased on a site (or network of sites) in the past and target advertisements based on this information.
- **Convergence:** We will soon enter the next round of the E-marketing battle as broadband reaches the masses. The Internet will become more ubiquitous and wireless; televisions will become more interactive; video/data/voice appliances will converge; brand advertising and direct marketing practices will integrate; domestic brands, commerce and marketing will become even more global; and big marketing spenders will spend more money online. Many companies that are well positioned today will need to continue to evolve to take advantage of the opportunities.
 - The success of Internet advertising companies will largely be driven by how they maneuver among the coming developments. Rich media, brought on by broadband, will allow advertisers much greater creativity by bringing in new types of advertising to the Internet, as well as enhancing some of the more traditional forms. Broadband technology will allow the convergence of television and the Internet.
 - Dubbed "interactive TV," in its simplest form, will consist of a television with some interactive capabilities. Basically, a user will see a television screen that is three-quarters traditional television, but with a frame that has Internet capabilities. This frame will allow users to access up-to-theminute sports scores or news on the Web, for example. More importantly for E- marketers, it would allow viewers to immediately leap to the website of an advertiser whose ad was being shown. The user could find out more information or order the product right there.

• **Commerce:** The last emerging fundamental of e-marketing is commerce, whether it includes offering goods and services directly, or marketing those of another company for a fee, thus helping to cover the fixed costs of site operations and to offset customer acquisition costs.

To be successful on the Internet, e-marketers will have to do more than reproduce their off-line business models on line because these business models work only at considerable scale. Interestingly, It is possible for online marketers to be profitable even at lower sales volume if they exploit efficiencies in e-marketing and synergies with the off-line business, with examples as follows.

Exploiting more than one channel to close the transaction

 Although early winners on the web might belong to an exclusive club of Internet start-up companies, established players in the off-line industry can catch them and even overtake them by offering a choice of channels.

Leveraging low customer acquisition costs:

 Traditional brick-and mortar companies can bring their existing customers online at a much lesser cost than Internet start-up companies who must lay out a hefty amount per head to acquire customers.

Exploiting alternative revenue streams:

An online presence offers an E-marketer a wider variety of sales opportunities.
 For web-based retailers, acting as an agent on behalf of the customer can become a revenue source in the future.

Purchasing scale at low volumes:

 E-marketers can cut down on their purchasing cost and shorten their procurement cycle by replacing EDI tools with Internet based ones that facilitate product comparison, streamline logistics, and help B2B vendors aggregate their retailer's back office purchases.

Reducing customer churn:

 Given the high cost of replacing established customers, losing them is expensive. A web presence supplies the personalized attention that could keep customers loyal.

Maximizing the pricing potential:

 It has been reported by consumer researchers that buyers shop online more for convenience than for cost. In view of this relative indifference to price, emarketers can capture some margin premium, at least in the early days of their sites.

Challenges in e-marketing:

 Every online fulfillment operation, large or small, faces four main challenges: controlling customer data, integrating on- and off-line orders, delivering the goods cost effectively, and handling returns.

Controlling customer data:

 As outsourcing arrangements proliferate and delivery services become more expert in using information technology, e-marketers risk losing their lock on consumer data. In an economy where knowledge is revenue as well as power, emarketers must consider how to strike a balance between the efficiencies offered by the out-sourcing of fulfillment and the confidentiality that keeping data inhouse preserves.

Integrating on and off-line orders:

When the volume of orders is high, companies must decide how much integration they need. In a totally integrated system, Internet orders would be automatically transmitted through a processing center and transferred to the supplier's manifest. An integrated system with full ERP (enterprise resourceplanning) capabilities, for example, can ensure that surges in demand don't retard key fulfillment operations such as data entry, inventory, and packing.

Delivering the goods cost-effectively:

At present, every single transaction challenges e-marketers to deliver the goods quickly, cheaply, and conveniently. But this is largely a technical and logistical problem, and it will be possible (though perhaps expensive) to solve it by developing new sorting and scanning equipment and by deploying larger delivery vehicles. Making contact with the recipient is a trickier problem but one that must be resolved if the full potential of "eimpulse" orders is to be realized, for an impulse purchase loses its power to gratify if the product or service takes too long to appear. But since each missed delivery adds as much as a full day to the fulfillment process, spanning that "final mile" to the home can take longer than traveling the rest of the fulfillment loop.

Handling returns:

E- Marketers, with their emphasis on convenience and customization, must match the high standard of service exhibited by some physical marketers regarding returns. At present, they do not. To begin with, few ecommerce retailers (or mail order companies, for that matter) design their packaging for easy returns. Customers often have to find new packing materials; calls to arrange credits and refunds, and physically take packages to delivery services. Each step represents an inconvenience that, however minor, can combine with others to create negative feelings about the vendor. Even if a convenient solution for returns were developed, e-marketers might discover that impulse sales carry hidden costs. The implication is that fulfillment costs must be driven down to preserve profitability.

Choice of Marketing Strategy:

An online company's choice of marketing strategy will depend on four main variables: the nature of the customer's interaction with the product and seller; the current capabilities of the business; the capabilities that are (or will become) "commodity" operations, in which competitive advantage cannot be sustained; and the trade-off between time and control. This is essentially a value chain concept (as propounded by Porter) whereby e-marketers look at each component of the value chain and the support activities to determine where and in what form can they add value to the customer. This translates into their competitive advantage. And in this entire process, it is the 7 Cs of e-marketing that act as fundamental guiding principles.

Rethinking the business model:

 As e-marketers align the "contract" and the "construction," they must also align the economic model that will sustain their businesses. For most of them, the very process of taking the brand online will force a fundamental reconsideration of the business.

Channel supporter:

 E-marketers can use the Internet more to support their existing channels than to generate additional sales. Beyond cross-channel promotions, many brick-andmortar companies can use the web to increase their customers' understanding of their products and services. Others can harness the web's interactivity to improve their product development and product mixes by inviting customer responses on their web sites.

Advisory and information service providers:

 An expert (such as an investment adviser or a personal shopper) can offer consumers unbiased advice for a fee. A business can also collect, process, and sell information through the Internet.

Retail model:

 Vendors or products can be aggregated to facilitate transactions for buyers. Many companies can also achieve success as online auctioneers. Sellers of goods and services can provide the content; community may come from matching sellers with buyers and setting bidder against bidder; and commissions on sales and advertising revenue can generate the commerce.

Vertical model:

 The business model that may take the greatest advantage of the Internet is the vertical model, which specializes, in a particular category or a product. It might provide specialized information and advice as well as access to a community with common interests.

4.6 ONLINE PAYMENTS AND SECURITY

The information technology, the Internet high speed development, electronic commerce has caused the current distribution realm significant transformation

gradually. In the electronic commerce practice, the online electronic payment is the electronic commerce essential link, also is the foundation condition which electronic commerce can smoothly develop. Not the corresponding real-time electron payment means coordinate, electronic commerce only can be does not have the practical significance "the hypothesized commerce", but is unable to realize on the genuine net the transaction.

The on-line electronic payment is the electronic commerce development core, is completes on the net the transaction essential step, also is at present restricts the domestic network application development a bottleneck.

Online Electronic Payment

- Online electronic payments are not tantamount to electronic payments. In the emergence of e-commerce, credit cards have long been represented by electronic means of payment, credit cards in shopping malls.
- Many hotels and other places and items could swipe of the card, POS terminals Regulations, ATM cash forms of payment. And online electronic payments, online payments also known as electronic currency, broadly speaking, refer to a transaction in the online exchange of funds; It is a network-based electronic financial, a business card transactions for all types of electronic tools and media, the electronic computer and communications technologies as a means Electronic data (binary data) stored in the bank's computer system and through the computer network system in the form of the flow of electronic information transfer and payment.
- Electronic Payment System is the basis for online payments, and online payments system development is a higher form of electronic payment. It makes electronic payment may, at any time, through the Internet directly to the transfer, settlement and form e-business environment.

Common Online Electronic Payment System

In online shopping online electronic payment function is the key issue to ensure the consumers are fast and convenient, we have to ensure the safety and secrecy of the parties to a transaction, which requires a complete electronic trading systems. Currently, several online electronic payment systems used for:

Internet Bank Card Payment System

Including online credit card, smart card (IC card) payment systems are established in accordance with the standards set shopping and payment system. Internet users in specific ways: sending banks coast and password encryption sent to the bank for payment. And the payment process for customers, merchants and verify the legitimacy of a request for payment. At present, domestic banks had set up such a bank cards for online payments.

Based on the bank card payment the following four models:

1. No security model

Its features: users complete control of the bank card business information, the transmission of messages without bank card security.



Fig 4.1: No security model

2. through third-party brokers paid model

Its characteristic is as follows: Bank card information is not open to the transmission network, is paid by users. Both businessmen trusted third party (agents) to complete.



Fig 4.2 Third-Party Brokers Paid Model

3. Simple encrypted payment system model

Its characteristic is as follows: the use of encryption technology to bank cards and other critical information encrypted digital signature to confirm the authenticity of the message. Business servers and the need for software support services.



Fig 4.3 Encrypted Payment System Model

4. SET (security electronic transaction) model

"Secure Electronic Transactions," and referred to the SET. In an open Internet is a realization of the international agreements and standards for secure electronic

transactions. Their characteristics are as follows: SET transactions participants to provide certification to ensure data security, integrity and no repudiation of transactions, in particular to ensure that no information leaked to the cardholder's account for the businesses. Guarantee the safety of the SET.



Fig 4.4 SET Model

E-Cash (Electronic-cash) Internet Payment System:

- E-cash is a form of data, the currency in circulation, there is electronic cash currency; it can be converted to cash a series of encrypted numerical sequence number, and then use these sequences to show the value of all sizes.
- Its characteristic is as follows: an agreement between the banks and businesses and authorization, identity verification by e-cash to complete it, electronic cash can be kept, admission, and transfer to smaller transactions.

E-cash and e-payment systems also have the advantage of cash, mainly as follows:

- Anonymity;
- Not shadowing;
- Savings on transaction costs;
- Savings on transmission costs;
- Poor risk;
- Pay flexibility;
- Prevent forgery and repeatability.

E-purse Internet Payment System

Users use e-purse shopping, the first in a personal bank account and users into a certain amount; then the corresponding electronic wallet service system free software to download and install an electronic purse; then download the corresponding website to apply online and access the cardholder "electronic safety certificate". Users shopping, the only direct hits "electronic wallet" icon and following the importation of their coast. Corresponding information such as passwords by e-purse will pay to complete the follow-up work. Modern foreign companies such as a smart card as an e-purse to the online payment system. E-purse is sporadic small payment transactions always used in conjunction with bank cards to help users complete the entire shopping process.

Electronic check (E_check) Internet Payment System

Electronic check transfer payments from paper checks to the merits of using digital transmission o transfer money from one account to another account. These electronic check payments in businesses and banks linked to the online password transmission. Most common use encryption keys handwritten signature or personal identification numbers instead of signatures. Thus ensuring the safety of this form of payment.



Fig 4.5 E_check Internet Payment System

STRATEGY OF E-COMMERCE SECURITY:

As e-commerce security problems caused by many factors, to solve the security problem from different aspects, offers a variety of countermeasures.

1. Security Strategy

- To ensure the safety communications must be the necessary measures to guard against them.
- Communications links, we can use a firewall, proxy server, Virtual Private Network (VPN) technology; in the identification and authentication, encryption and authentication techniques.

2. Legal Protection

 As e-commerce activities are a commodity transaction and security issues should be protected by law must ensure that the legal status of electronic contracts and digital signatures, electronic contracting parties to the contract approved Electronic Contract denied or modified to ensure that electronic contracts can be implemented.

3. Social Moral Norms

 As e-commerce transactions are not direct, face-to face features Transactions are often seen in the traditional process of e-commerce fraud is bound to have security implications. Thus, the healthy development of ecommerce depends on the establishment and perfection of social ethics.

4. Perfect Management Strategy

As e-commerce transaction system is a highly integrated man-machine system, in addition to network security, and management is also very important, but the factors that play a decisive role. Thus, the whole system of power distribution management and supervision, management training and assessment, ethical and professional standards must draw up complete training regulations, management jobs in order to enhance the spirit of love.

4.7 WORKING OF SEARCH ENGINES

Three basic tasks are performed

- 1. Searching the internet, selecting documents based on important words
- 2. Keep an index of the words they find, and where they find them.
- 3. Allow users to look for the words or combinations of words found in that index.

Gathering pages (web crawling)

- Programs called Spiders; robots etc. collect pages of the Web for indexing.
- Start processing with a certain number of starting point URLs and follow other links.
- Visited pages or portions of pages are saved for analysis.

Indexing pages

- Indexing determining what a page is about.
- Looks for the components of a page like
 - o **<title>**
 - o <meta> tags
 - o Link texts
 - Texts in headings and body
 - Comment text
- Tries to distill the meaning of the page.
- Position or frequency of the text will be considered.
- Stop words, the more common and little useful ones, are ignored.
- Pages with similar key words are ranked and are stored in the database.

Page Rank

- A numeric value that represents how important a page is, on the web.
- When one page links to another, it is effectively casting a vote for the other page.
- The more votes cast on a page, the more important the page is.
- Importance of the page that casts the vote also determines the importance of the vote.
- A page's importance is calculated from the votes cast for it.
- Page A has voted for Page B but not to Page C.
- Hence Page Rank for each page is
 - Page $\overline{A} = 0.15$
 - Page B = 1
 - Page C = 0.15
- Consider the linking of all pages to all pages.
- This produces page rank as
 - Page A = 1
 - Page B = 1
 - Page C = 1 resulting in maximum Page Rank.

Providing a Search Mechanism

Deals with search interface and result page





- Search page an interface, the user makes their query form.
- Contains primary query text box, varies to advanced searches.
- Basic and advanced searches differ in interfaces.

4.8 DESIGNING A SEARCH INTERFACE:

- Search form must fit the type of data being searched.
- HTML and Scripting languages are used.
- Primary element Search query field.
- Second aspect Button to execute the search. (Form buttons or Custom buttons)

Result Page Design

- Must contain as much information as possible relevant to user's query.
- Elements of a result page
 - Original query
 - o Scope of the search and the results found
 - Page or document titles
 - Page summaries
 - URL of returned page
 - Size and Type of result
 - Relevancy of results
 - Keyword matches

Googl	Web Images Groups News FroogleNew! more w Images Groups News FroogleNew! More w	Advanced Search Preferences
Web	Results 1 - 100 of about 1	75,000 for <u>blu book</u> . (0.87 seconds)
Amazon com: Boo 1999 Blu-Book Film, Production Directory, www.amazon.com/s	te book bks: 1999 Blu-Book Film, TV and Commercial TV and Commercial Production Directory (Blu-Book Film & TV 1999), Hollywood Reporter ac/obidos/tg/detail/-/0941140237?v=glance - 64k - <u>Cached</u> - vicantion	Sponsored Links Blue Book Prices New and used car trade-in prices Calculate your way to a new car! Auto.GetaStart.com

Negative results page

- Tries to help the user identify what went wrong and says why a query went wrong.
- Possibilities nothing may match the search terms; search facility may be used incorrectly.
- Functions:
 - Clear failure message
 - Search again mechanism
 - Help information