



## **SYLLABUS**

**Class – B.Com III Year**

**Subject – Online Marketing**

UNIT – I	Internet concepts and technologies. Concept and evolution of E-Commerce. Concept and methods of Online marketing.
UNIT – II	E-Marketing: Retailing in E-Business. Internet Marketing, Advertising and product displays on internet.
UNIT- III	Mobile Commerce (M-Commerce): Overview of M-Commerce. Wireless Application Protocols (WAP). Components of mobile commerce, mobile- Apps. etc.
UNIT- IV	Electronic Payment System: Special feature required in payment system in E- Commerce. Types of E- Payment system: E-Cash, E-Wallets, E-Cheques , credit Cards, debits cards, smarts cards etc.
UNIT – V	Security aspects in E-Commerce: Security risks in E-Commerce, types of threats, sources or threats, security tools& risk management approaches.



## UNIT- I

### Internet

Internet is defined as an Information super Highway, to access information over the web.

However, It can be defined in many ways as follows:

- Internet is a world-wide global system of interconnected computer networks.
- Internet uses the standard Internet Protocol (TCP/IP).
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer location.
- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name.
- For example, a DNS server will resolve a name **http://www.tutorialspoint.com** to a particular IP address to uniquely identify the computer on which this website is hosted.
- Internet is accessible to every user all over the world.

### Evolution

The concept of Internet was originated in 1969 and has undergone several technological & Infrastructural changes as discussed below:

- The origin of Internet devised from the concept of **Advanced Research Project Agency Network (ARPANET)**.
- **ARPANET** was developed by United States Department of Defense.
- Basic purpose of ARPANET was to provide communication among the various bodies of government.
- Initially, there were only four nodes, formally called **Hosts**.
- In 1972, the **ARPANET** spread over the globe with 23 nodes located at different countries and thus became known as **Internet**.
- By the time, with invention of new technologies such as TCP/IP protocols, DNS, WWW, browsers, scripting languages etc., Internet provided a medium to publish and access information over the web.

### Advantages

Internet covers almost every aspect of life, one can think of. Here, we will discuss some of the advantages of Internet:

- Internet allows us to communicate with the people sitting at remote locations. There are various apps available on the web that uses Internet as a medium for communication. One can find various social networking sites such as:
  - Facebook
  - Twitter
  - Yahoo
  - Google+
  - Flickr
  - Orkut



- One can surf for any kind of information over the internet. Information regarding various topics such as Technology, Health & Science, Social Studies, Geographical Information, Information Technology, Products etc can be surfed with help of a search engine.
- Apart from communication and source of information, internet also serves a medium for entertainment. Following are the various modes for entertainment over internet.
  - Online Television
  - Online Games
  - Songs
  - Videos
  - Social Networking Apps
- Internet allows us to use many services like:
  - Internet Banking
  - Matrimonial Services
  - Online Shopping
  - Online Ticket Booking
  - Online Bill Payment
  - Data Sharing
  - E-mail
- Internet provides concept of **electronic commerce**, that allows the business deals to be conducted on electronic systems.

### Disadvantages

However, Internet has proved to be a powerful source of information in almost every field, yet there exists many disadvantages discussed below:

- There are always chances to lose personal information such as name, address, credit card number. Therefore, one should be very careful while sharing such information. One should use credit cards only through authenticated sites.
- Another disadvantage is the **Spamming**. Spamming corresponds to the unwanted e-mails in bulk. These e-mails serve no purpose and lead to obstruction of entire system.
- **Virus** can easily be spread to the computers connected to internet. Such virus attacks may cause your system to crash or your important data may get deleted.
- Also a biggest threat on internet is pornography. There are many pornographic sites that can be found, letting your children to use internet which indirectly affects the children healthy mental life.
- There are various websites that do not provide the authenticated information. This leads to misconception among many people.

**Internet is a global system of interconnected computer networks that connect various Domain Name System (DNS) servers, web hosting servers, home and business users, etc. Internet is a network of networks.**

### Internet Protocols

Lot of data transfer happens in an internet between computers and networks, and there should be some rules to regulate these transfers. A communications protocol is a system of digital rules for data exchange within or between computers.

Some of the important protocols of internet are:

**TCP (Transmission Control Protocol),**



**IP** (Internet Protocol),  
**UDP** (User Datagram Protocol),  
**HTTP** (Hypertext Transfer Protocol),  
**FTP** (File Transfer Protocol) and  
**SMTP** (Simple Mail Transfer Protocol).

The **Internet protocol suite** is a set of communications protocols used for the Internet and similar networks. It is commonly known as TCP/IP, because its most important protocols are the Transmission Control Protocol (TCP) and the Internet Protocol (IP), and they were the first networking protocols defined in this standard.

**Transmission Control Protocol (TCP)** is a connection-oriented protocol that provides reliable, ordered, error-checked delivery of packets.

**Internet Protocol (IP)** has the task of delivering packets from the source host to the destination host solely based on the IP addresses in the packet headers.

**UDP** is a connection-less protocol that does not provide reliability, order or error-checking. UDP messages are referred to as datagrams and a datagram is defined as a basic transfer unit associated with a packet-switched network in which the delivery, arrival time, and order of arrival are not guaranteed by the network.

**HTTP** is the protocol to exchange or transfer hypertext. Hypertext is structured text that uses logical links (hyperlinks) between nodes containing text.

The **World Wide Web** (abbreviated as WWW or W3) or the web is a system of interlinked hypertext documents accessed via the Internet. With a web browser, one can view web pages and navigate between them via hyperlinks.

**FTP** is a standard network protocol used to transfer files from one host to another host over a TCP-based network.

**SMTP** is an Internet standard for electronic mail (e-mail) transmission across Internet Protocol (IP) networks.

### IP Address

Websites and pages over the internet have a unique worldwide address called the **IP addresses** (e.g. 192.168.1.6), but a **domain name** (e.g. javajee.com) is used to refer to a website as it is easy to remember.

There are two versions of IP specification in use now: IPv4 and IPv6. IPv4 is the most widely used version currently. An IPv4 address contains 4 parts and each part will be a number between 0 and 255, e.g. 192.168.1.6. An IPv6 address has 8 parts and each part must be a hexadecimal number between 0 and FFFF, e.g. FF3:9B3D:999:0:FF12:420:20:444D.

### Domain Name System (DNS)

Domain Name System (**DNS**) provides a mapping between domain names like javajee.com and IP addresses like 192.168.1.6. When we type a domain name like javajee.com in the browser, it



will use DNS to resolve or find the IP address and browser then uses the IP address to connect to the correct machine.

### **Web application**

A web application is any application software that runs on a server and we can access it using a web browser client. For instance, consider this website; you access it using a client browser, but it is deployed on a server located elsewhere.

Popular server side technologies used to create web applications include JSP/Servlets, ASP, PHP etc. These server side technologies will require corresponding software libraries to be installed at the server side.

### **Web server**

A web server is software that helps to deliver web content (web pages) to the clients (e.g. web browser) through the Internet using HTTP protocol. Some of the commonly used web servers are Apache web server, Microsoft Internet Information Services (IIS), Nginx Nginx (pronounced "engine x") and GWS (Google Web Server). Other older web servers include Jigsaw web server from W3C, Oracle web server and Xitami web and FTP server developed by iMatix Corporation. Java web containers like Apache Tomcat also can act as a web server, but is usually used along with another web server like Apache server.

### **Web browser**

A web browser (e.g. Internet Explorer, Google chrome, Mozilla Firefox and Opera web browser) can read HTML documents and compose them into visible or audible web pages. JSP (Java Server Pages) based on Java, ASP (Active Server Pages) based on .net or the open source PHP (PHP: Hypertext Preprocessor) pages, all finally generate html pages with other client side technologies like JavaScript and CSS, and is sent to the web browser. Try viewing the source of any web page through the view source option and you will only html, JavaScript or CSS, but no JSP, ASP or PHP.

### **Cookies**

A cookie is a small piece of data sent from a website and stored in a user's web browser while the user is browsing that website. A cookie is also known as an HTTP cookie, web cookie, Internet cookie, or browser cookie. A website usually uses cookies to store preference information, session identification data or insensitive user information. A cookie is a form of temporary storage on the client side and their integrity cannot be guaranteed. The user is free to modify them or delete them and is usually cleared when the browser cache is cleared. Cookies may not be supported in some browsers and may even be disabled. Hence programmers should not rely on cookies and should provide alternate means. The security model of cookies is also very strict: they are stored based upon domain name and may also optionally depend upon the exact path to the resource that saved data into them, and a browser usually saves each websites cookies in a separate file.

### **URI, URL and URN**

A uniform resource identifier (URI) is a string of characters used to identify a name of a resource. Such identification enables interaction with representations of the resource over a network, typically the World Wide Web, using specific protocols. Schemes specifying a concrete syntax and associated protocols define each URI.

**URI** is an abstract concept and the two concrete forms of URI are



uniform resource locator (**URL**), which is most common and is frequently referred to informally as a web address. Uniform resource name (**URN**), which is rarely seen, and was designed to complement URLs by providing a mechanism for the identification of resources in particular namespaces. E.g. (from wikipedia): *The ISBN 0-486-27557-4 cites unambiguously a specific edition of Shakespeare's play Romeo and Juliet. The URN for that edition would be urn:isbn:0-486-27557-4. To gain access to this object and read the book, its location is needed, for which a URL would have to be specified.*

### **Client side technologies: HTML, JavaScript and CSS**

HTML, JavaScript and CSS are three important client side web technologies which can be understood by a web browser and are independent of the server side technologies like JSP, ASP or PHP. As you have seen, JSP, ASP or PHP pages are finally converted to client side technologies such as HTML, Javascript and CSS, and sent to browser.

**HTML** (Hypertext Mark-up Language) is a markup language used to mark-up the different elements of a web page like headings, paragraphs, tables, images etc. Without markup, the contents will just appear as normal text without any headings, paragraphs, tables or images. A web browser (e.g. Internet Explorer, Google chrome, Mozilla Firefox and Opera web browser) can read HTML documents and compose them into visible or audible web pages.

**Cascading Style Sheets (CSS)** is a style sheet language used for describing the presentation semantics (the look and formatting) of a document written in a markup language like HTML. CSS is designed primarily to enable the separation of document content (written in HTML or a similar markup language) from document presentation, including elements such as the layout, colors, and fonts. You can also define the look and feel using HTML alone, but that is not a good practice. One of the advantages of using CSS is that you can change the look and feel of a page just by changing the style sheet and don't have to change the web page itself.

**JavaScript (JS)** is a dynamic programming language understood by web browsers. We can write client-side (browser) scripts using JavaScript to create dynamic content on web pages like scrolling text, expanding menu etc., interact with the user, validate user inputs at client side, communicate asynchronously with a server, and even alter the document content that is displayed. JavaScript is not related to Java through the name is similar and there is some syntax similarity. JavaScript is not limited to web browsers, but can be used in many areas like mobile and desktop applications. There are many JavaScript libraries that provide some JavaScript functions out of the box and we can just use them without writing them again. Popular such libraries include JQuery, Angular JS, Dojo Toolkit, Ext JS, Microsoft's Ajax library etc.

### **Introduction to Commerce**

- Commerce is basically an economic activity involving trading or the buying and selling of goods.

For e.g. a customer enters a book shop, examines the books, select a book and pays for it. To fulfill the customer requirement, the book shop needs to carry out other commercial transactions and business functions such as managing the supply chain, providing logistic support, handling payments etc.

As we enter the electronic age, an obvious question is whether these commercial transactions and business functions can be carried out electronically.

In general, this means that no paperwork is involved, nor is any physical contact necessary. This often referred to as **electronic commerce (e-commerce)**.



The earliest example of e-commerce is **electronic funds transfer**. This allows financial institutions to transfer funds between one another in a secure and efficient manner.

Later, **electronic data interchange (EDI)** was introduced to facilitate inter-business transactions.

### E-Commerce

- “E-Commerce or Electronic Commerce, a subset of E-Business, is the purchasing, selling and exchanging of goods and services over computer networks (such as Internet) through which transactions are performed”.
- “E-Commerce can be defined as a modern business methodology that addresses the needs of organizations, merchants and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery by using Internet”.
- E-Commerce takes place between companies, between companies and their customers, or between companies and public administration.

### **FEW EXAMPLES OF E-Commerce are:**

- Amazon.com, an online bookstore started in 1995 grew its revenue to more than 600\$ million in 1998.
- Microsoft Expedia, an integrated online travel transaction site helps to choose a flight, buy an airline ticket, book a hotel, rent a car etc. in only a few minutes.

### E-Commerce vs Traditional Commerce

- E- Commerce is about the sale and purchase of goods or services by electronic means, particularly over the internet. In a pure e-commerce system, transactions take place via electronic means. In this case, you will access a cyber bookstore and download a digital book from a server computer.
- In a physical or traditional commerce system, transactions take place via contact between humans usually in a physical outlet such as a bookstore.  
For e.g. if you want to buy a book, you will go to a physical bookstore and buy the physical book from a salesman.
- E-Commerce is more suitable for standard goods, intangible goods; whereas traditional commerce is more suitable for non standard goods, perishable goods, and expensive goods.
- Complex products such as cars are better served by integrating e-commerce and physical commerce.

### Difference between Traditional Commerce and E-commerce

<u>S.No</u>	<u>Traditional Commerce</u>	<u>Ecommerce</u>
<u>1</u>	<u>Customers can easily identify and authenticate a merchant by seeing him directly.</u>	<u>It is not easy in this case.</u>
<u>2</u>	<u>Customers can directly talk to merchant. Communication pages is not in the hands of a third party.</u>	<u>Customers can only see the representation &amp; can only see the web.</u>
<u>3</u>	<u>Customers can interact with other customers and gain feedback about merchant from other customers.</u>	<u>Customers cannot interact with other customers.</u>
<u>4</u>	<u>It is not available all the time</u>	<u>It Is available 24*7*365</u>
<u>5</u>	<u>It is slow method</u>	<u>It is fast method</u>

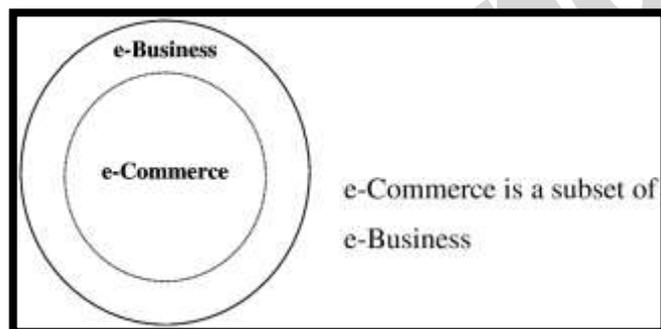


### E-Business

- “E-Business is the conduct of business on the Internet, not only buying and selling but also servicing customers and collaborating with business partners”.
- E-Business means connecting critical business systems directly to customers, vendors and suppliers- via the Internet, Extranet and Intranets.
- Therefore it means using electronic information to boost performance and create value by forming new relationships between and among businesses and customers.
- One of the first to use the term was IBM, in October 1997, when it launched a campaign built around e-business.

### E-Business enables organizations to accomplish the following goals:-

- Reach new markets.
- Create new products or services.
- Build customer loyalty
- Make the best use of existing and emerging technologies.
- Achieve market leadership and competitive advantage.
- Enrich human capital.



### Advantages of E-Commerce to Customers

- **Reduced Prices:-** Costs of products are reduced since the stages along the value chain are decreased. For instance, intermediaries can be eliminated by the company directly selling to the customers instead of distributing through a retail store.
- **24-Hour Access:-** Online businesses never sleep as opposed to brick and mortar businesses. E-Commerce allows people to carry out businesses without the barriers of time.



- **Global Marketplace:-** Consumers can shop anywhere in the world. Currently according to World Trade Organization (WTO) there are no custom duties put on products bought and traded globally electronically. This also provides wide selection of products and services to consumers.
- **More Choices:-** Provides consumers with more choices. For e.g. before making any purchase, customer can study about all the major brands and features of any item. It also provides consumers with less expensive products and services by allowing them to shop in many places.

#### Advantages of E-Commerce to Businesses

- **Increased potential market share:-** The internet enables businesses to have access to international markets thereby increasing their market share. Companies can also achieve greater economies of scale.
- **Low cost Advertising:-** Advertising on the internet costs less than advertising on print or television depending on the extent of advertisement. Advertising on the internet itself is less costly since there is less cost associated with it in terms of printing and limited television spots.
- **Low barriers to Entries:-** Anyone can start up a company on the internet. Start-up costs are a lot lower for companies since there is less need for money for capital.
- **Strategic Benefits:-** The Strategic benefits of making a business e-commerce enabled is that it helps reduce the delivery time, labour cost and the cost incurred in document preparation, data entry, error detection etc.

#### Disadvantages of E-Commerce

- **Hidden Costs:-** Although buying online is convenient, the cost of this convenience is not always clear at the front end. For e.g. on-line purchases are often accompanied by high shipping and re-stocking fees, a lack of warranty coverage and unacceptable delivery times. In fact, too many e-commerce companies have developed a reputation of overcharging for shipping and handling.

- **Lack of Security:-** One of the main roadblocks to the wide acceptance of e-commerce by businesses and consumers alike is the perceived lack of adequate security for on-line transactions.

For e.g. Consumers are growing increasingly worried about providing credit card information over the Internet.

During the past few years, the press has been filled with reports about hackers breaking into e-business and stealing credit card information.

- **Lack of Privacy:-** Customers also worry about the privacy implications of data gathered by organizations of all types and sizes. Even at the simplest data level, sales information is stored in databases connected to web servers, thus exposing the information to cyber criminals. Because data gathering on the web is so easy, databases routinely contain information about customer purchasing habits, credit information and so on. In many cases, companies sell customer database information to marketing companies. In turn, the marketing companies engage in massive e-mail campaigns to attract new customers. It doesn't take long for the customer's email box to be filled with unwanted email (also known as Spam).

- **Network Unreliability:-** Although the Internet is designed to overcome the single point of failure problem, there have been several well-publicized incidents of network failures during the past few years. Network reliability problems may be generated by such factors as:-

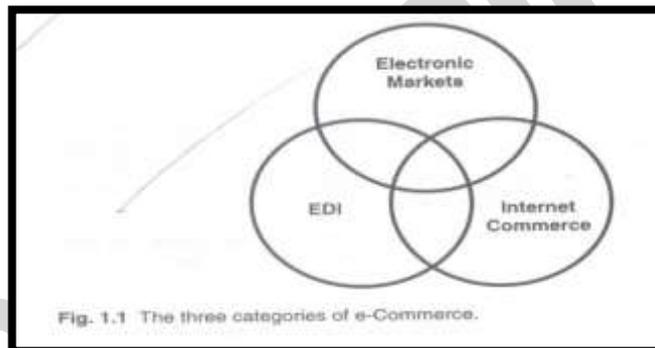
- Equipment failure in the network connection provider.



- Accidental problems caused by nature-such as lightning, floods, earthquakes that affect communication lines.
- Long response time due to increased network traffic or inadequate bandwidth.
- **Low Service Levels:-** Another common complaint about doing business online is the low level of customer service that online companies tend to provide. Although technology has automated business transactions to a large extent, there remains a real need for the human touch. Therefore e-commerce websites must provide:-
  - A pleasant and problem free pre-ordering and ordering experience. The website design is an important interface.
  - Readily available easily used feedback options.
  - Quick complaint resolution.
  - Timely and low-cost shipping delivery to customers.

### **Scope of E-Commerce**

- E-Commerce is a general concept covering any form of business transaction or information exchange executed using information and communication technologies ((ICT's).
  - It includes electronic trading of goods, services and electronic material.
- It takes place between companies, between companies and their customers or between companies and public administrations.



- **Electronic Markets:-**

An electronic market is the use of information and communication technology to present a range of offerings available in a market segment so that the purchaser can compare the prices of the offerings and make a purchase decision

e.g. Airline Booking System
- **Electronic Data Interchange:-**
  - It provides a standardized system for coding trade transactions so that they can be communicated from one computer to another without the need for printed orders and invoices & delays & errors in paper handling.
  - It is used by organizations that make a large no. of regular transactions.

e.g. EDI is used in the large supermarket chains for transactions with their suppliers.
- **Internet Commerce:-**
  - Information and communications technologies can be used to advertise & make sales of wide range of goods & services.
  - This application is both for business to business & business to consumer transactions.

e.g. The purchase of goods that are then delivered by post or the booking of tickets that can be picked up by the clients



## UNIT- II

### Definition: E-Marketing

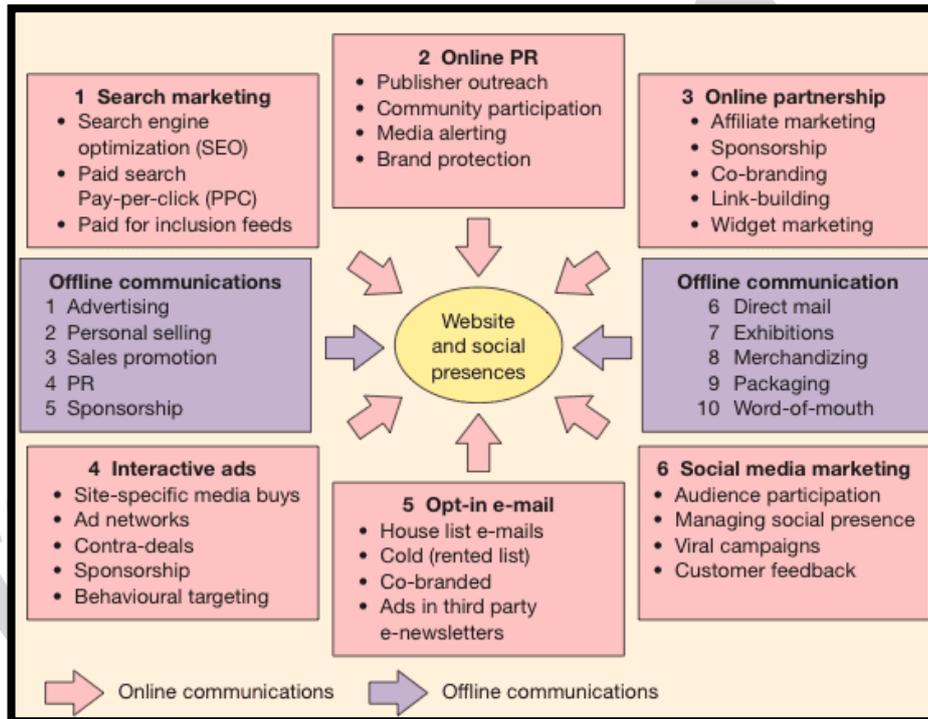
E-Marketing (Electronic Marketing) are also known as Internet Marketing, Web Marketing, Digital Marketing, or Online Marketing. E-marketing is the process of marketing a product or service using the Internet. E-marketing not only includes marketing on the Internet, but also includes marketing done via e-mail and wireless media. It uses a range of technologies to help connect businesses to their customers.



Like many other media channels, e-marketing is also a part of integrated marketing communications (IMC), which helps a brand grow across different channels. E-marketing has become a pivotal tactic in



the marketing strategy adopted by companies using several digital media channels.



### Advantages of E-marketing

Certain advantages of emarketing are discussed as below:

1. Much better return on investment from than that of traditional marketing as it helps increasing sales revenue.
2. E-marketing means reduced marketing campaign cost as the marketing is done through the internet
3. Fast result of the campaign as it helps to target the right customers.
4. Easy monitoring through the web tracking capabilities help make emarketing highly efficient
5. Using e-marketing, viral content can be made, which helps in viral marketing.

### Types of e-marketing

There are several ways in which companies can use internet for marketing. Some ways of e-marketing are:

1. Article marketing
2. Affiliate marketing
3. Video marketing
4. Email marketing



5. Blogging

6. Content marketing All these and other methods help a company or brand in e-marketing and reaching customer through the internet.

Hence, this concludes the definition of E-Marketing along with its overview.

**Retailing in E- Business :-**

### **Electronic Commerce and Retailing**

Retailing is expected to change with the rapid development of new online sales and distribution channels that literally can be used from anywhere, anytime—from work, school, a hotel, car, or airplane. These developments should impact retailing as much as the advent of strip malls, catalogue retailing, and TV-based home shopping. Almost every retailer is re-evaluating every aspect of its operation from customer service to advertising, merchandising to store design, and logistics to order fulfilment. Furthermore, reacting to the pressure of retailers, suppliers are assessing technology based solutions to drive down costs (labour, delivery, and production) and become more efficient producers of goods.

Online channels such as online services and the Web are also impacting traditional retail business models. In the traditional model, the customer went to the store and located the product. In the online model, the retailer seeks out the customer. The success of catalog retailers demonstrates that a significant portion of consumers have embraced the reverse model: the retailer going to the consumer.

However, retailers need to consider the following issues in developing a business model:

**Product/Content Issues:** What kind of products are suited for online retailing?

**Software Interface Issues:** What kind of features will constitute an effective interface? What features make it easy to find and select items for on-line purchase?

**Process Issues:** What are the specific steps in the shopping process from a consumer's perspective? What kind of processes should companies develop to fulfill orders efficiently?

Before examining the implications of changing consumer behavior and online retailing in the existing retail business, let us step back for a moment and ask the question: Why should retailers consider the online environment as a way of doing business? The answer lies in understanding the market changes that affect retailing and that will continue to affect it in the future.

### **E-Retailing**

E-retailing essentially consists of the sale of goods and services. Sometimes we refer to this as the sale of tangible and intangible goods. We can divide tangible goods into two categories: physical goods and digital goods.

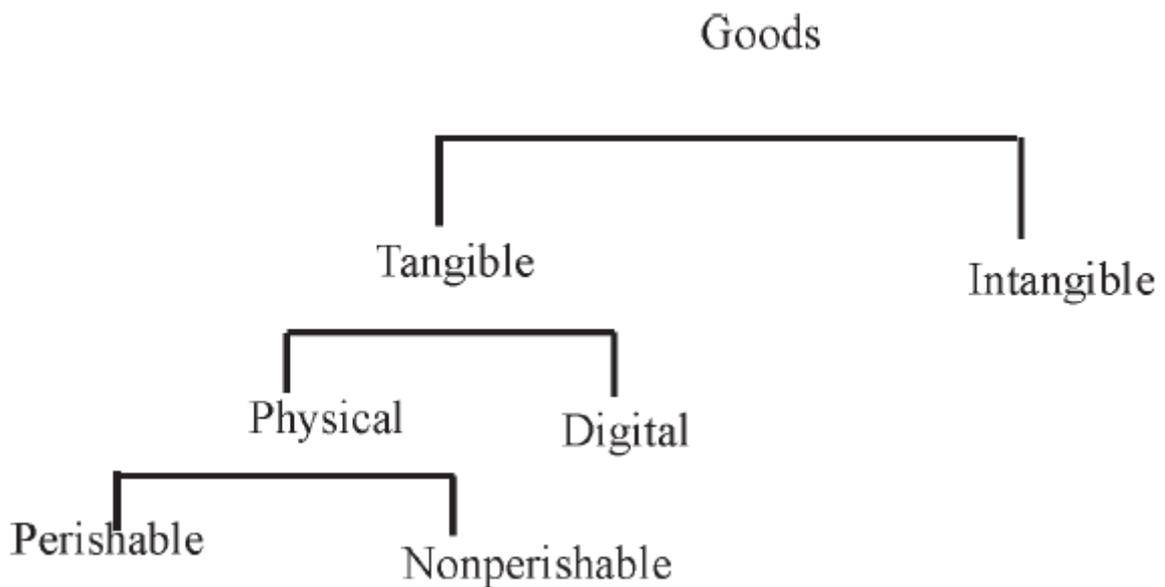
Examples of physical goods would be a book, a television set, a video recorder, a washing machine, etc.

Examples of digital goods are software and music, which may be downloaded from the internet. The sale of intangible goods is sometimes called E-servicing.



Examples of services that may be sold are information such as the most recent stock prices, the most recent foreign exchange rate, or education.

Entertainment such as -games that would be played on the internet are also examples of e-services. So are the sales of services such as telecommunication services or banking services. The sale of tangible and intangible goods are all referred to as Customer oriented e-commerce or etailing, if they are sold directly to the consumer who is the end user. Here we discuss the sale of tangible goods.



### **Difference between Traditional retailing and E-retailing**

#### ***Traditional retailing***

Traditional retailing essentially involves selling to a final customer through a Physical outlet or through direct physical communication. This normally involves a fairly extensive chain starting from a manufacturer to a wholesaler and then to the retailer who through a physical outlet has direct contact with the final customer.

Examples of physical outlets that retailers currently use are: Malls

- generalized stores (e.g. department store)
- specialized stores
- franchise stores

It is useful to reflect that even in traditional retailing we have moved away from just using a static physical outlet within which a customer can have direct contact with the retailer. Thus, more recent forms of traditional retailing include

- direct mailing
- telemarketing
- door-to-door sales



- vending machines

Direct mailing to a customer normally involves sending a brochure or catalogue to a customer. The customer browses through this catalogue and then carries out mail ordering. In some respects, this notion of browsing through a catalogue is a forerunner of e-retailing. Direct mailing, telemarketing, door-to-door sales, or the use of vending machines includes other forms that have actually moved away from a physical fixed outlet and in a way are intermediate forms of the movement away from traditional physical retailing outlet to the virtual retailing we see on the internet.

### ***E-retailing***

The internet has allowed a new kind of specialization to emerge. Instead of specializing just in a special product line, they allow specialization in particular classes of customers and sellers. Thus, we see lastminute.com, which allows last minute purchases of travel tickets, gift, and entertainment to be matched against last minute sellers of the same items. Here, we see specialization not in a product line but in a class of purchasers and a class of sellers. This kind of specialization would not have been possible before we had the internet.

In addition to these specialized stores, we also get generalized e-stores where a store sells several product lines under a single management. Examples of these generalized stores include JC penny and Walmart.

We also have the electronic counterpart of malls or e-malls. E-malls essentially provide a web-hosting service for your individual store much in the way that mall provide a hosting service in the sense of a physical location for your store.

Examples of these e-malls are Yahoo! Store, GEO Shops, and CNET stores:

### **Benefits of E-Retailing To the customer**

Customers enjoy a number of benefits from e-retailing.

The first of these is **convenience**. It is convenient for the customer as he does not have to move from shop to shop physically in order to examine goods. He is able to sit in front of a terminal and search the net and examine the information on goods. The second aspect of convenience he gets is in terms of time. Normally, the traditional shop has an opening time and a closing time and the customer can only visit the shop within these periods. On the net, the customer can choose at any time to visit a site to examine the goods that are available and actually carry out his purchasing at one's own convenient time. The third type of convenience that the customer gets is that he has access to a search engine, which will actually locate the products that he describes' and also the site where they may be available, or perhaps even locate the sites where they may be available at the best price

The second type of benefit to customers is **better information**. The Internet and the World Wide web are essentially communication media that allow retailers to put on quite extensive information related to their products, which is available to the customers.

The third type of benefit that the customer gets is **competitive pricing**. This is due to two factors.



The first is lowered costs to the retailer because he does not have to maintain a physical showroom, he does not have to hire several shop assistants, and these savings can be passed on to customers in the form of reduced prices.

Secondly, competitive pricing pressure that arises from the fact that the customer is now able to look at prices at several sites. Therefore, the pressure is always there on the retailer to maintain a competitive price for his products.

#### To the business

There are a number of benefits of e-retailing to the business itself.

The first of these is **global reach**. The retailer now is no longer restricted to customers who are able to reach the store physically. They can be from anywhere around the globe. The retailer must, of course, deliver the goods of a purchase to the customer.

The second benefit is better **customer service**. The use of email and the use of electronic interchange of messages between the customer and the retailer allow better communication between the customer and the retailer. These allow one to easily inquiries and deal with complaints. These also allow a much more rapid response time than was possible in the days of faxes and postal mail.

The third benefit is the **lowered capital cost to the retailer**. The retailer does not have to maintain showrooms; he can probably have lower inventories. Thus, while Amazon.com lists over a few million titles, it keeps an inventory of a few thousand best selling titles only. Therefore, the retailer has lower warehousing costs. He does not have to have many shop assistants who are physically answering questions and showing the customer goods.

The fourth benefit to the retailer is **mass customization**. Based on requests by the customers, the retailer is now able to carry out mass customization with reduced time to market for the customized products.

The next advantage is **targeted marketing**. The retailer is now able to pick on a specific targeted group of customers and direct marketing towards these customers. The retailer is also able to provide **more value-added services** in the way of better information, add-on services to basic services, or add-on options to products that he is selling.

The last advantage to the retailer consists of **different new forms of specialized stores that he is now able to utilize**.

#### Models of E-Retailing

There are several models for e-retailing and these include

Specialized e-store

Generalized e-store

E-mall

Direct selling by the manufacturer



Supplementary distribution channel

E-broker

E-services

### ***Specialized e-stores***

The first class of model what we mention in e-retailing was the specialized e-store and here you can distinguish between two different kinds of specialization: the more traditional specialization along product lines and specialization by function. When you have specialization by product line, essentially you have a store that decides to pick one particular product line, say books, flowers, CDs, clothes, and sells only this particular product line. It may also choose to position itself in a particular part of the product line, e.g. clothes; it could choose to position itself at the very expensive end of the market selling brand names \_ Gucci and Armani.

Alternatively it could do more mass marketing by selling non – brand names at a much lower price, or it could go into discount selling. So, you can have a specialization by product line, and then you could have specialization - positioning within that product line to cater for a particular part of the marker.

In contrast to this, a new kind of specialization is emerging on the internet, as mentioned. earlier, namely specialization by function. A good example of this is lastminute.com In lastminute.com they sell gifts, travel tickets, and other items for last minute shoppers who want to purchase these items at a very short notice. Generally, when one purchases an item at a very short notice (e.g. travel), he often pays a premium, which is an extra amount for the convenience of booking the travel at the last minute. Now, this means that the air ticket is likely to cost much more than if he had purchased it some time before traveling and made use of different discounts or promotions.

The producers of the web site lastminute.com realized that there are groups of customers who make these purchases at the last minute and feel some degree of angst at having to pay the premium for doing this shopping at the last minute. On the other hand, you will find that you may have sellers, e.g. airline companies, that have empty seats at the last minute which they are unable to fill. So, what lastminute.com does is bring together travelers who want to book at the last minute and an airline which has got spare capacity at the last minute, and allow the former to buy from the latter at the last minute. In this situation, the purchaser may get his airline ticket at a reduced price.

So, there is a win-win situation for both the purchaser and the seller. This is a unique kind of specialization. It is very difficult to do this unless one utilizes the internet to carry out this kind of specialization.

### ***Generalized e-stores***

The next category of e-retailing models that we intend to look at is generalized e-stores. Generalized e-stores sell a large number of product lines rather than con-fining themselves to just one or a very few product lines.

### ***E-malls***

The next e-retailing model we consider is the e-mall. In an e-mall, cyberspace is rented out to cyber e-stores that wish to sell their goods. This store could be a specialized or generalized e-store. So, several



product lines can be present in a single e-mall. However, unlike the generalized e-store which is under a single unified management, in an e-mall, each store is under its own management. E-mall management is responsible only for creating the cyber sites that can be rented and can support services and marketing of the mall. It, thus, provides a web hosting service.

Several e-malls also provide software tools, which can be utilized by a prospective e-store to create and maintain its e-store. The advantage for an e-store is that it is grouped together with other stores in a well-known e-mall site and, therefore, is likely to pick up visitors to the mall.

#### ***Direct selling by the manufacturer***

A number of manufacturers with well-known brand name products have chosen to use the internet to carry out direct selling via the internet. One of the best known here is Ford, which utilizes the internet to achieve direct selling but uses its dealer network to facilitate distribution and delivery. The other well-known examples are Cisco systems and Dell computers. Note that this approach permits mass customization to meet customer preferences. This direct selling by the manufacturer has an important disintermediation effect leading to reduced costs to the end customer and increased profitability to the manufacturer.

A note of caution is important here. By and large, this approach can be used by manufacturers of well-known brands of products because the customer already knows the product. Secondly, the manufacturer must have a thorough understanding of customer preferences, otherwise he has to rely on the customer knowledge of a retailer.

#### ***Brokers or intermediaries***

This class of e-retailers is essentially an extension of the notion of a broker from the physical to the cyber world. **A broker is an intermediary who**

may take an order from a customer and pass it on to a supplier

may put a customer with specific requirements in touch with a supplier who can meet those requirements

may provide a service to a customer, such as a comparison between goods, with respect to particular criteria such as price, quality, etc.

Thus, brokers provide comparison shopping, order taking and fulfilment, and services to a customer. That is the reason why they are sometimes referred to as electronic intermediaries.

#### **There are several different models for electronic brokers and these include:**

Brokers that provide a registration service with directory, search facilities, e-payment facilities, and security-related facilities. Any business can register with such an e-broker.

Brokers that meet a certain requirement such as a fixed price.

Brokers that provide comparison shopping between products. The last model i.e. E-services is discussed in the next lecture.

#### **Features of E-Retailing**



The provision of an on-line catalogue, which allows one to browse through different categories of goods. Thus, it is dynamic and linked with order process.

The provision of a search engine, which is a very important feature that does not exist in traditional retailing. The provision of a shopping cart, which allows convenient goods selection. An ability to provide an automatic price update. Personalization of store layouts, promotions, deals, and marketing.

The ability to distribute digital goods directly. Thus, these goods can be downloaded instantly.

An on-line customer salesperson, “who” can help customers to navigate through the site. An order status checking facility, which is a useful feature before submission. The use of Forums (collaborative purchasing circles) to create a customer community and thus increase “stickiness.”

### **Changing Retail Industry Dynamics**

Important factors that affects the retailing industry dynamics are:

- Overbuilding and excess supply.
- Change in consumer demographics, which more premium placed on efficient use of time
- Changes in consumer behavior, with less focus on brand name and more on lowest prices.
- Technology improvements that provide greater convenience and more information than traditional retailing.

### **Overbuilding and Excess Capacity**

With online retailing, constraints of time and space disappear. There is no bricks and mortar storefront to worry about, no critical locations. This new way of retailing can severely affect companies that have invested in expansion and adding capacity. It is important to understand the trouble traditional retailers will face if online retailing takes off.

The 1980s was a period of overexpansion and turmoil for retailers. By the end of the decade, complaints about excessive retail space were being voiced. Profits were declining and control of operating expenses became a paramount management objective. Retailers reduced staff and minimized merchandising in order to enhance profits. Sales growth and market share development were given second priority behind profit enhancement.

In the 1990s, companies are under pressure to grow and produce profit. An important measurement of profit gains is gross margin per square foot. For many retailers, these numbers is either growing slowly or declining, partially reflecting a less favorable product mix and more competition. Inadequate productivity, both per worker and per unit of space, is also reducing profit margins. Overbuilding also resulted in a growing shortage of lowcost, entry-level workers for the retail industry. The shortage of entry -level workers means that retailers are using under trained workers who are less able to empathize with shopper needs-leading to a perception that retailers in general and shopping centres in particular are unable or unwilling to provide quality service.

Clearly, with crowded domestic markets and competition constantly grinding away at operating profit, new ways of retailing are being explored by forward-thinking companies such as Wal-Mart.



### **Demographic Changes**

Shopping patterns are beginning to change with the increase of time-strapped, two-career couples and the aging of America. Value and time management are the consumer concerns driving interest in online retailing. Recent retail data shows a decline in the amount of time Americans are spending in shopping malls [EDR95]. The suggested reasons vary: time constraints, safety concerns, and growing frustration with the lack of courteous service and insufficient product information. Understanding the implications of time constraints on consumer shopping behavior is important as they portend the trends to come. For instance, Americans have openly embraced shopping channels like QVC and Home Shopping Network and retailers like CUC International.

Today's time-strapped shoppers have less time and want better values, fewer hassles, and more options. Today, a shopping trip requires a consumer to decide what he or she or the family needs, brave the traffic on the way to a store, hunt for parking, find and select items for purchase, take them to a checkout, wait in line, pay for the items, sometimes bag them, and carry them back home. It can be a hassle and a lot of work, so most working professionals have learned to dread shopping trips. As technology improves, it may not be long before driving to the store gives way to online shopping with home delivery as provided by Peapod.

In contrast, there is a growing segment of the population for whom time constraints are less of a problem. The demographic outlook in the United States is for an increasing share of older shoppers (age 50 and above) who prefer shopping at stores rather than online. However, the product mix offered by many department stores and malls is increasingly out of touch with the aging population and does not reflect the shift in purchasing power.

Also, with the aging of the population, there is evidence to indicate a shift in consumer interest away from material goods and toward experiences, such as travel and recreation. In addition, as people get older, they tend to become more frugal. Retailers will need to concentrate on value by offering new product mixes. By this we mean a product mix that includes not only merchandise but also bundles in entertainment and "recreational" shopping with movie theatres, restaurants, bookstores, libraries, and community meeting facilities.

This sort of change is already occurring in bookstore design (such as Borders Bookstores and Barnes and Noble), which include a variety of facilities such as coffee shops. However, building shopping malls based on these new business models is a risky venture and requires huge investments.

### **Consumer Behavior**

Consumer behavior is more volatile than ever before, and companies need new ways of responding to consumer needs and satisfying demand. According to one survey, the typical consumer spent only four hours a month in a shopping mall in 1990 versus ten hours in 1985, and sales per square foot dropped. Specialty retailing-power centres, discount malls, discount stores, and catalogue shopping-has become one solution for closely monitoring consumer trends and reacting to them quickly. All of these alternatives have one thing in common: they provide consumers with a very large selection of producers priced with deep discounts.

Consumers are no longer as influenced by brand names as they used to be. The emergence of the value shopper is changing retailing. Today, the shopper is less willing to pay the premium for the brand name and much more attentive to quality and value. The decline in gross margins is the first evidence of the



impact of that change, reflecting lower initial mark-ups and more discriminating shoppers in that segment clearly, retailers that are focused on providing value-the best price, service, and selection-regardless of the brand name will be successful.

The real differentiating characteristic for retailers will be in their ability to define what the broad or niche consumer segment is looking for, identifying characteristics of customers in each target segment, and learning how to bundle products and package brands so that they become the preferred choice for online customers

**Technology Improvements in Electronic Retailing**

Today, electronic retailing is still far from being a competitive threat to more traditional store retailing (see Table), but it is becoming increasingly attractive as technology and applications improve, and retailers gain experience.

Type of outlet	Definition and Examples
Shopping malls	These include under one roof general merchandise , drug stores and groceries department stores
Supercenters	These consist of three or more anchor stores with a total leasable are between 200,000 and 700,000 square feet
Factory outlet mall	These primarily stock name brand manufacturers' items. These are growing in stature and popularity as well. Like power centres, factory outlet mall are also gaining market share at the expense of shop ping malls
Warehouse clubs	These are retailers offering common consumer products at near whole sale prices when purchased in bulk quantities. Examples include wal mart'sam'club, price/Costco and BJ'wholesale

Three dominant forms of electronic retailing channels are: television re-tailing, CDROM retailing, and online service based retailing, in which we include Web-based retailing. Now we can discuss about the most prominent one: the television retailing.

**Television Retailing:**



Television retailing grossed an estimated Rs. 3.2 billion in 1994. One of the pioneers in this area is Home Shopping Network, Inc. (HSN), which began broadcasting electronic retailing to a small, local audience in 1982. Three years later they took this still unproven idea national- and made it work. Today, HSN is a television-based retail, entertainment company, and online retailer (owns Internet Shopping Network), with coast-to-coast customers and annual sales of \$1 + billion.

The breadth and reach of TV retailing are amazing. In 1994, HSN reached 65.8 million television households throughout the United States. These households received the signals via cable, broadcast, and satellite dish, twenty-four hours a day, seven days a week. Unlike online audiences, which tend to be predominantly affluent and well educated (net annual income is estimated at Rs. 60,000 - Rs. 80,000), the target audience for television re-tailing is moderate income households and mostly women. How does it work? The TV retail marketing and programming are divided into segments that are televised live, with a show host who presents the merchandise and conveys information relating to the product, including price, quality, features, and benefits. Show hosts engage callers in on-air discussions regarding the currently featured product or the caller's previous experience with the company's products. Viewers place orders for products by calling a toll-free telephone number.

Generally, merchandise is delivered to customers within seven to ten business days of placing an order. The purchased item may be returned within thirty days for a full refund of the purchase price, including the original shipping and handling charges.

The success of television shopping is the result of the effective utilization of electronic media for capturing the power and influence of celebrity and the magic of showmanship, and bringing them to bear on a sale. In its annual report, the Home Shopping Network states that a celebrity can debut a line of jewelry on HSN and sell more than Rs. 2 million in a single weekend. Of course, there's another advantage to television retailing.

When customer interest, which is monitored by the number of calls being received, begins to wane, the retailer knows it instantly and can simply move on to the next product. More recently, infomercials have become a crucial retailing topic. The infomercial has become a new and interesting way to retail specialty products. Modern filming techniques and ingenuity make it possible to create high-quality, cost-efficient, and entertaining documentaries that sell. This coincides with the television viewing public's appetite for information.

Infomercials are an especially logical medium since retailers have the opportunity to economically test and evaluate a product through mass channels such as television retailing before committing major capital resources to infomercial production.

### **Management Challenges in Online Retailing**

While changes in retailing may be driven by technology, managerial vision is required for successful implementation. Traditionally, retailing has been a low-tech environment in which retailing executives often relegated technology issues to back-room operators. These managers are most at risk, as they do not have a clue that a major revolution has begun. Most of them have never used a computer (or had to), never been on an online service, and do not know what the Internet is or what it can do. The winners will be the players who understand how to leverage the unique capabilities of the on-line medium to effectively meet the changing needs of the consumer.



While the technology required to implement online retailing is maturing, many management issues remain unanswered. No one really knows yet how to build and run a successful, mass market online mall. The sales Medium is new, the technology is new, and retailers have a lot to learn about tricky technology, customer behavior, and management issue. But one thing is clear: For online retailing to succeed, online technology must complement management and operational strategy.

### **Online Retailing Success Stories**

Peapod, CUC International, and Virtual Vineyards help to explain the intricacies of online retailing.

### **Online Retailing: Peapod's Experience**

Peapod, based in Evanston, Illinois, is using the online medium for food retailing services. Founded in 1989 by two brothers, Peapod is a member of an online grocery / drug-store shopping and delivery service that already has thousands of customers in the Chicago, San Francisco, and Boston areas. Peapod was founded on the idea that people do not want to go to the grocery store. Peapod has an online database of over 25,000 grocery and drugstore items, and allows comparison shopping based on price, nutritional content, fat, or calories.

Other features include electronic coupons, retailer preferred customer discounts, and other benefits like recipes, tips, and information. Peapod membership also allows users to use the shopping and home delivery service. Peapod has a staff of professional shoppers, produce specialists, and delivery people who fulfil the order.

### **How Does It Work?**

Peapod provides customers with home shopping services via Pc. Customers need to buy a software application that enables them to access Peapod's database through an online computer service. Peapod initially had a DOS-based system with graphics. They introduced a new version of the software in 1995-a Windows platform in which product pictures are available. Using the PC, a consumer can access all of the items in a grocery store and drug store. Peapod customers create their own grocery aisles in their own virtual store. Customers can request a list of items by category (cereals), by item (Frosted Flakes), by brand (Kellogg's), or even by what is on sale in the store on a given day. Within categories, they can choose to have the items arranged alphabetically by brand or sorted by lowest cost per ounce, package size, unit price, or nutritional value.

Customers also can create repeated use shopping lists (baby items, barbecue needs, and the like). Peapod's back office is linked with the mainframe databases of the super-markets at which it shops for its customers (Jewel in Chicago and Safeway in San Francisco), allowing it to provide the supermarkets' stock keeping units and shelf prices electronically to its customers. Once consumers have made a selection, they can then give specific shopping instructions, such as "substitute with same calories," or red grapes only." They can click on the "Comment" button and type in any extra information they would like the Peapod shopper to know. At any time during the order, a consumer can subtotal the amount purchased, or access the "Help" screen for immediate assistance.

Online ordering is simple: users double-click on the Peapod icon and then enter their user IDs and passwords. On verification, users get access to a whole grocery store and drug store of items. Before the actual purchase of an item, users can view images of it and the nutritional content as well. The system allows users to sort items by various criteria like price, price/ unit, total calories, fat, protein,



carbohydrates, and cholesterol. With these features, Pea pod aims to target the health and fitness conscious consumer who chooses foods tailored to specific dietary needs.

There are also search features to help locate a particular item. A “Find Item” option at the top of the screen lets users search either by brand name or product type. When users have finished shopping, they click on “Done” and the order is electronically routed to Peapod. During the transaction closing process, users need to choose a delivery time within a 90- minute slot. Pinpoint delivery within a 3Dminute window) can be selected for a small additional charge. Payment can be made by check, charge, or Peapod Electronic Payment. Eighty-five to ninety percent of Peapod’s orders come in via computer; the rest are faxed or phoned. Peapod orders are taken centrally, and then faxed to the stores.

The store gets a printout with the order, the delivery address, and instructions for getting there. Each order is filled by a Peapod employee, who shops the aisles of the store. The employee pays for the groceries, often at special Peapod counters in the back of the store. The order is then taken to a holding area in the supermarket, where the appropriate items are kept cold or frozen until the deliverer picks up a set of orders and takes them to the customers within their 90-minute pre-selected windows. At each stage-ordering, shopping, holding, and delivery-the processes are tailored to provide personalized service at a relatively low cost.

If a customer has a problem, he or she can call Membership Services, and a service representative will try to resolve the matter. Peapod treats each call as an opportunity to learn (and remember) each customer’s preferences and to figure out what the company can do to improve service as a whole. For example, service representatives found that some customers were receiving five bags of grapefruits when they really wanted only five grapefruits. In response, Peapod began asking customers to confirm orders in which orderentry errors may occur.

Peapod members are charged actual shelf prices, plus a monthly service fee, a per-order charge of Rs. 5.00 plus 5 percent of the order amount. Customers are willing to pay these extra charges for convenience and because Peapod provides a lower cost shopping experience for the consumer. Consumers save money-despite the extra overhead-because they use more coupons, do better comparison shopping, and buy fewer impulse items than they would if they shopped at a real supermarket.

Reducing impulse purchases is important when you consider that 80 percent of the items purchased in a grocery store are impulse items-non-planned purchases. In addition, consumers save time and have more control because they can shop from home or work whenever they want.

### **What is the Business Model?**

Rather than automating the trip to a retail store, as other online providers are doing, Peapod is using interactive technology to change the shopping experience altogether.

Indeed, the formula for Peapod’s success is the busy American lifestyle. The homes it delivers to cut across many demographics.The one thing these demographics have in common is they have better things to do than grocery shop. Still, if it were not for wellmanaged logistics, these customers would be back in the stores in a second. The behindthe- scenes logistics are central to what Peapod is all about; Peapod has to make sure the orders get to the stores and that they are shopped correctly.

### **How does Peapod Compete with Traditional Retailers?**



Traditional retailers make money from the suppliers. They provide access to customers and make their money by buying on deals, volume discounts, and getting coop advertising. Peapod makes all of its money on the customers it serves, it is a mass customizer. It creates the supply chain after identifying a specific demand from a specific customer, and it feeds off the existing infrastructure to do it. However, existing retailers do have some advantages.

An important, though subtle, advantage enjoyed by food retailers is the shopper's resistance to switching food stores because of familiarity with the shelf locations of products purchased. It is also inconvenient for consumers to relearn dozens of product locations at a new store. The online environment must offer significant advantages to overcome shopper inertia and induce trial, let alone continued, patronage. Is Peapod a competitor to the retail grocer? Not really. Peapod's strategy has been to partner with the retailer rather than compete directly.

A lot of credibility comes with the name of the retailer in its individual market. Peapod can help grocers expand into places that might not otherwise be practical from a capital investment standpoint. However, it is quite possible that in the future Peapod may be tempted to compete with grocers by emulating certain aspects of their warehousing. Why? As these new retail formats emerge, and once Peapod gains enough customers, Peapod will be tempted to say it is costing a lot to go to the store and pick up product off the shelf. To avoid the overhead, Peapod could have its own warehouse. **As soon as the Peapod does** that it is likely to fall into the same traps as the retailers, such as having an overflow warehouse when something is available on a deal or buying products before there is actual need.

### **Internet marketing :-**

Meaning:

Internet marketing, also referred to as web marketing, online marketing, or e-marketing, is the marketing of products or services over the Internet. The Internet has brought media to global audience. The interactive nature of the Internet marketing in terms of providing instant responses and eliciting responses is the unique quality of the medium.

Internet marketing is sometimes considered to be broad in scope because it not only refers to marketing on the Internet but also includes marketing done via e-mail and wireless media. The management of digital customer data and electronic customer relationship management systems are also often grouped together under the Internet marketing.

### **ADVERTISEMENTS:**

Internet marketing ties together creative and technical aspects of the Internet, including design, development, advertising and sales.

Components of Internet Marketing:

Internet marketing evolves in a fast-phase manner. It is dynamic and requires every online business and marketers to keep updated with the changes in the system. There are two components of Internet marketing:

#### **1. B-to-B (B2B):**



**B.Com.III Year**

**Subject Online Marketing**

It refers to business to business e-commerce, where business firms sell their products and services to other business firms using the Internet.

ADVERTISEMENTS:

2. B-to-C (B2C):

It refers to business to consumers, where business firms sell their products and services to the consumers using the Internet.

Effectiveness of Internet Marketing:

The effectiveness of Internet marketing can be enhanced if the following points are considered:

1. Build trust, because web site serves as the platform for selling/displaying products and services.

ADVERTISEMENTS:

2. Web site should be simple, but professional in approach.

3. The content of the web site should be relevant and quantitative.

4. Every possible means should be taken into account to drive Internet traffic towards the web site.

5. Being an Internet marketer, requires discipline and perseverance.

Ways to Conduct Internet Marketing:

ADVERTISEMENTS:

In the era of modern world, the use of internet has connected the whole world together. Internet has been used not only for personal or professional purposes but also for marketing reasons. Businessmen find immense potential in the use of Internet for promotional purposes.

This has given boost to a marketing strategy called 'Internet marketing'. It has revolutionized the fields of advertising and marketing to a larger extent. Marketers not only aim at producing high quality goods and services but also cost- effectively and successfully promoting them in the market.

Online Promotion:

It can be done through various means and strategies.

ADVERTISEMENTS:

1. Firms can promote the products and services of the company by establishing an online presence. An entrepreneur can introduce the products of the organization by creating an official web site.

A web site gives an overview to the prospective customer about the corporation. This enables the firm to establish a global presence and reach global market.

2. E-mail marketing is another form of online promotion. In this kind of marketing, firms can reach the prospective customers directly through the means of an electronic mail. An advertiser can invite the customer for subscription of newsletters or alerts for special offers by the company. An electronic mail



promotion generates sales and often repeats sales. It is an effective way to fetch new and retain present customers.

3. There are banner advertisements placed on the online classified directories. These advertisements are also placed on the web sites which promotes business similar to the advertiser's business. These banners draw maximum traffic towards various web sites.

4. Firms can organize online forums for the purpose of inviting the most eager visitors to join, and air their views and opinions. This enables firms to keep check on their negative online reputation and promote favourable reputation.

Advantages of Internet Marketing:

1. Internet marketing is relatively inexpensive when compared with the ratio of cost against the reach of the target audience.
2. Companies can reach a wide audience for a small fraction of traditional advertising budgets.
3. The nature of the medium allows the consumers to research, and purchase products and services at their own convenience. Therefore, businesses have the advantage of appealing to the consumers in a medium that can bring results quickly.
4. The strategy and the overall effectiveness of the marketing campaigns depend on the business goals and the cost-volume-profit analysis.
5. Internet marketing can offer a greater sense of accountability for the advertisers.
6. Internet marketing refers to the online marketing, which is related to e-mail and wireless marketing methods.

Disadvantages of Internet Marketing:

1. Internet marketing sometimes appear to be confusing and at times considered as a kind of virus.
2. The more you know, the more you realize the need to learn more.
3. Typical business models lasts for two years, but Internet businesses sometimes lose appeal after 6 months.

ADVERTISEMENTS:

4. Intense competition.
5. Overwhelming knowledge to be learnt.
6. Too many skills to learn.
7. Takes a long time to learn many skills.

ADVERTISEMENTS:

8. Too many scams on the Internet.



9. Many people think it is easy to make money on the Internet.

Internet Marketing (also known as emarketing, web marketing, or digital marketing) is an all-inclusive term for marketing products and/or services online – and like many all-inclusive terms, internet marketing means different things to different people.

While the obvious purpose of internet marketing is to sell goods, services or advertising over the internet, it's not the only purpose a business using internet marketing may have; a company may be marketing online to communicate a message about itself (building its brand) or to conduct research. Online marketing can be a very effective way to identify a target market or discover a marketing segment's wants and needs. (Learn more about conducting market research). Essentially, though, internet marketing refers to the strategies that are used to market a product or service online, including:

- Website design strategies
- Search engine optimization and search engine submission
- Online promotions
- Reciprocal linking
- Email marketing
- Social media
- Blogging
- Digital advertising
- Article marketing
- Affiliate programs
- Video/Podcasting
- It's Time to Get Marketing Online

If you're not using internet marketing to market your business you should be. An online presence is crucial to helping potential clients and customer find your business - even if your business is small and local. (In 2017, one third of all mobile searches were local and local search was growing 50% faster than mobile searches overall.) Online is where the eyeballs are so that's where your business needs to be.

### 'Advertising'

**Definition:** *Advertising* is a means of communication with the users of a product or service. Advertisements are messages paid for by those who send them and are intended to inform or influence people who receive them, as defined by the Advertising Association of the UK.

**Description:** Advertising is always present, though people may not be aware of it. In today's world, advertising uses every possible media to get its message through. It does this via television, print



(newspapers, magazines, journals etc), radio, press, internet, direct selling, hoardings, mailers, contests, sponsorships, posters, clothes, events, colours, sounds, visuals and even people.

The advertising industry is made of companies that advertise, agencies that create the advertisements, media that carries the ads, and a host of people like copy editors, visualizers, brand managers, researchers, creative heads and designers who take it the last mile to the customer or receiver. A company that needs to advertise itself and/or its products hires an advertising agency. The company briefs the agency on the brand, its imagery, the ideals and values behind it, the target segments and so on. The agencies convert the ideas and concepts to create the visuals, text, layouts and themes to communicate with the user. After approval from the client, the ads go on air, as per the bookings done by the agency's media buying unit.

### **Product display on website :-**

The product that you intend to sell through your website must be displayed in an attractive and clear fashion. The web design should be such that it emphasizes the overall display of the product. The images used to display the products should be of good quality.

Digital display advertising is graphic advertising on Internet websites, apps or social media through banners or other advertising formats made of text, images, flash, video, and audio. The main purpose of display advertising is to deliver general advertisements and brand messages to site visitors.

According to eMarketer, Facebook and Twitter will take 33 percent of display ad spending market share by 2017. Google's display campaigns reach 80 percent of global internet users. Desktop display advertising eclipsed search ad buying in 2014, with mobile ad spending overtaking display in 2015.

### **Online advertising,**

It is also known as online marketing, Internet advertising, digital advertising or web advertising, is a form of marketing and advertising which uses the Internet to deliver promotional marketing messages to consumers. Many consumers find online advertising disruptive and have increasingly turned to ad blocking for a variety of reasons.

When software is used to do the purchasing, it is known as programmatic advertising.

Online advertising includes email marketing, search engine marketing (SEM), social media marketing, many types of display advertising (including web banner advertising), and mobile advertising. Like other advertising media, online advertising frequently involves a publisher, who integrates advertisements into its online content, and an advertiser, who provides the advertisements to be displayed on the publisher's content. Other potential participants include advertising agencies who help generate and place the ad copy, an ad server which technologically delivers the ad and tracks statistics, and advertising affiliates who do independent promotional work for the advertiser.

In 2016, Internet advertising revenues in the United States surpassed those of cable television and broadcast television. In 2017, Internet advertising revenues in the United States totaled \$83.0 billion, a 14% increase over the \$72.50 billion in revenues in 2016.

Many common online advertising practices are controversial and, as a result, have been increasingly subject to regulation. Online ad revenues also may not adequately replace other publishers' revenue streams. Declining ad revenue has led some publishers to place their content behind paywalls



## UNIT- III

### M-commerce (mobile commerce)

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets. As a form of e-commerce, m-commerce enables users to access online shopping platforms without needing to use a desktop computer. Examples of m-commerce include in-app purchasing, mobile banking, virtual marketplace apps like the Amazon mobile app or a digital wallet such as Apple Pay, Android Pay and Samsung Pay.

Over time, content delivery over wireless devices has become faster, more secure and scalable. As of 2017 the use of m-commerce accounted for 34.5% of e-commerce sales. The industries affected most by m-commerce include:

- Financial services, which includes mobile banking (when customers use their handheld devices to access their accounts and pay their bills) as well as brokerage services, in which stock quotes can be displayed and trading conducted from the same handheld device.
- Telecommunications, in which service changes, bill payment and account reviews can all be performed from the same handheld device.
- Service and retail, as consumers are given the ability to place and pay for orders on-the-fly.
- Information services, which include the delivery of financial news, sports figures and traffic updates to a single mobile device.

### Types of m-commerce

M-commerce can be categorized by function as either mobile shopping, mobile banking or mobile payments. Mobile shopping allows for a customer to purchase a product from a mobile device, using an application such as Amazon, or over a web app. A subcategory of mobile shopping is app commerce, which is a transaction that takes place over a native app. Mobile banking includes any handheld technology that enables customers to conduct financial transactions. This is typically done through a secure, dedicated app provided by the banking institution. Mobile payments enable users to buy products in-person using a mobile device. Digital wallets, such as Apple Pay, allow a customer to buy a product without needing to swipe a card or pay with physical cash.

### How mobile commerce works

With most m-commerce enabled platforms, the mobile device is connected to a wireless network that can be used to conduct online product purchases. For those in charge of developing an m-commerce application, important KPIs to monitor include the total mobile traffic, total amount of traffic on the application, average order value and the value of orders over time. Similarly, tracking the mobile add to



cart rate will help developers see if users are becoming customers. M-commerce developers may also be interested in logging average page loading times, mobile cart conversion rates and SMS subscriptions.

In terms of mobile payment products specifically, they operate through a form of peer-to-peer (P2P) sharing. Once a mobile device is paired with a bank card's information, the phone can be waved over a payment terminal to pay for a product. This contactless payment using a mobile device is possible due to the use of Near Field Communication (NFC).

### Advantages and disadvantages of mobile commerce

The advantages of m-commerce include:

- Added customer retention by being more easily accessible.
- More convenience for customers in comparing prices, reading reviews and making purchases without the need of a desktop computer.
- Wider variety of products and services.
- Automates a businesses' point of customer contact and sales.

Disadvantages of m-commerce include:

- A poorly executed mobile experience can deter customers from making purchases.
- Mobile payment options are not available in every geographic location and may not support every type of digital wallet.
- Businesses must know and comply with tax laws and regulations of all countries they ship to (some businesses will avoid this by only allowing purchases and shipping from their country of origin).

### Topic 2 OVERVIEW OF MOBILE COMMERCE

An 012

- In the early days, mobile phones were used to access the internet in some countries. Consumers have been using mobile to make remote purchases since the day it became available for general use.

Mobile commerce has been in existence since 1997. Coca-Cola was first installed two mobile-phone enabled vending machines in Finland and accepted the payment via SMS text messages. In 1997, Merita Bank of Finland launched the first mobile phone-based banking services.

M-commerce is the innovation in electronic market. With the help of m-commerce, marketers are getting opportunities to grow their business across the globe. M-commerce has brought drastic changes in the buying pattern of consumers. At the moment, most m-commerce transactions are being made to buy mobile add-ons, like games, apps, ringtones and screensavers etc.

The latest Martec International annual IT report suggests that, "The top 100 UK retailers investment in e-commerce and m-commerce has grown from 17% to 23% in 2011, overtaking spending on store systems. The report also suggests that 16% of the retailers already have an m-commerce platform and a further 12% are planning to adopt m-commerce in the near future."



There has been exponential growth in smartphones and tablets users and the number is growing every day. Over half a million apps, new digital retail interface experiences and mobile use persists to be inhibited by the slow propagation of a better-quality User Experience Design (UXD). This is the biggest hurdle we face as we move towards the future of mobile.

Developing good user experience for mobile users is quite different from web. UXD needs more simplified telegraphic communication that is more dependent on visual cues than words. Content should be optimized properly to give users great user experience. Developers create separate applications for each mobile platform and operating systems.

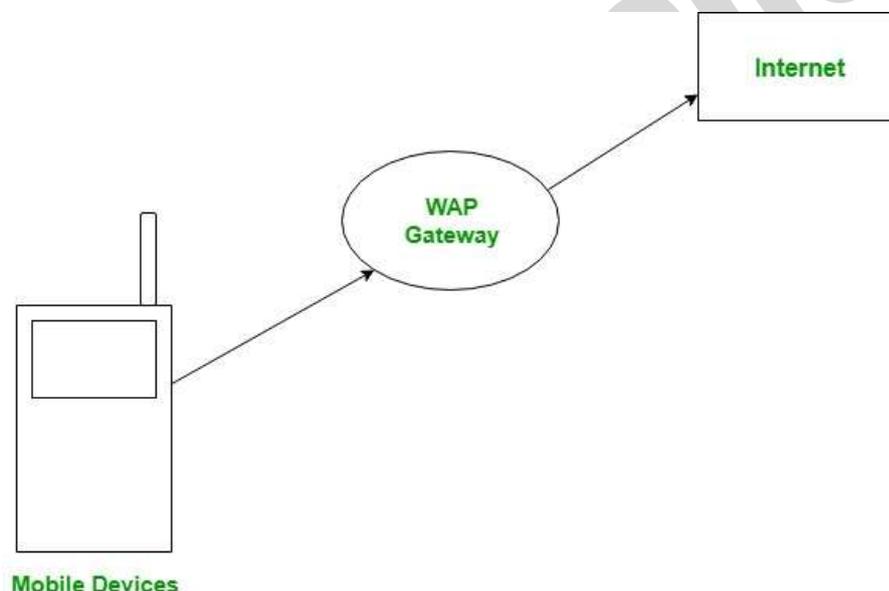
M-commerce is growing steadily with wireless handheld accessories and many more applications are released to facilitate anywhere shopping. So for m-commerce, the signs are encouraging, but for retailers, competition will increase and they will be facing many challenges and issues. Technology is taking the things in different directions, for instance mobile optimized sites, smartphone apps, loyalty, location based services, QR codes, contactless/payment.

The growth of m-commerce is undeniable. With the evolution of 4G mobile technology, the future of m-commerce seems extremely bright because several experiments are going on to introduce the upgraded the versions of mobile devices. The booming popularity of mobile has forced corporate world to expand the m-commerce platform to reach the masses and expand business.

### Topic 3

#### **Wireless Application Protocol**

**WAP** stands for **Wireless Application Protocol**. It is a protocol designed for micro-browsers and it enables the access of internet in the mobile devices. It uses the mark-up language WML (Wireless Markup Language and not HTML), WML is defined as XML 1.0 application. It enables creating web applications for mobile devices. In 1998, *WAP Forum* was founded by Ericson, Motorola, Nokia and Unwired Planet whose aim was to standardize the various wireless technologies via protocols. WAP protocol was resulted by the joint efforts of the various members of WAP Forum. In 2002, WAP forum was merged with various other forums of the industry resulting in the formation of **Open Mobile Alliance (OMA)**.





WAP Model:

**m-commerce (mobile commerce)**

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets. As a form of e-commerce, m-commerce enables users to access online shopping platforms without needing to use a desktop computer. Examples of m-commerce include in-app purchasing, mobile banking, virtual marketplace apps like the Amazon mobile app or a digital wallet such as Apple Pay, Android Pay and Samsung Pay.

Over time, content delivery over wireless devices has become faster, more secure and scalable. As of 2017 the use of m-commerce accounted for 34.5% of e-commerce sales. The industries affected most by m-commerce include:

- Financial services, which includes mobile banking (when customers use their handheld devices to access their accounts and pay their bills) as well as brokerage services, in which stock quotes can be displayed and trading conducted from the same handheld device.
- Telecommunications, in which service changes, bill payment and account reviews can all be performed from the same handheld device.
- Service and retail, as consumers are given the ability to place and pay for orders on-the-fly.
- Information services, which include the delivery of financial news, sports figures and traffic updates to a single mobile device.

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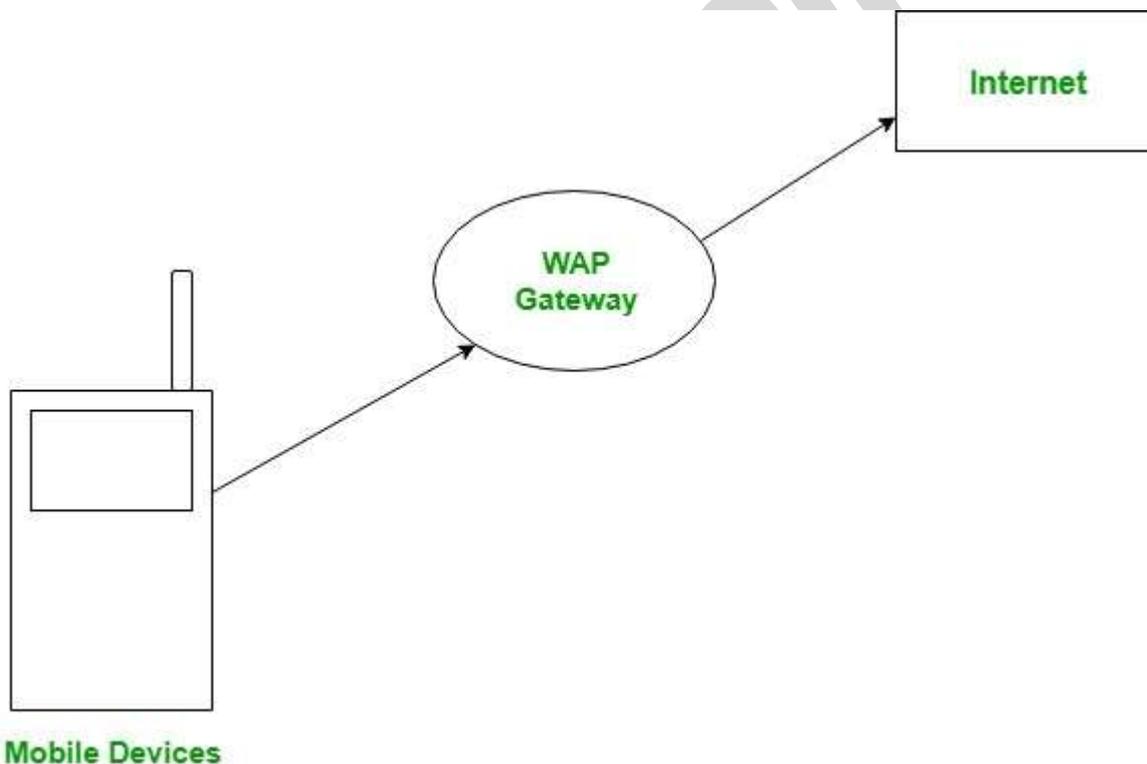


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Topic 3

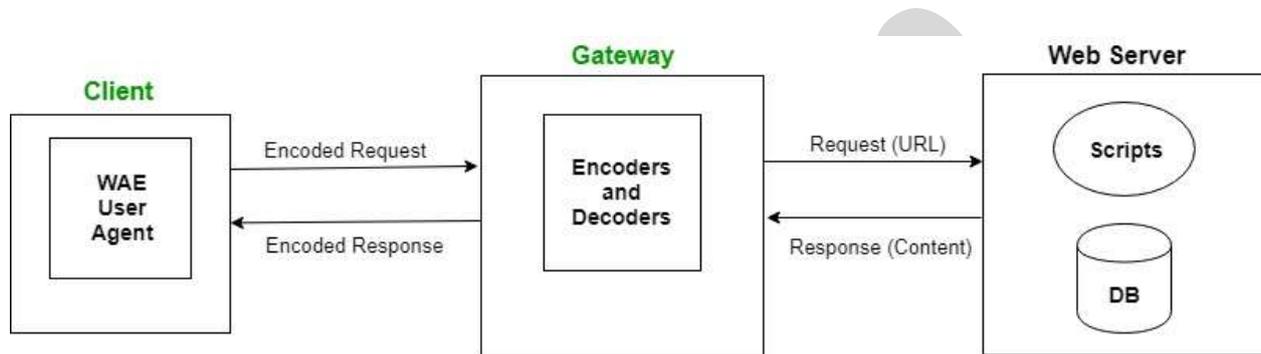
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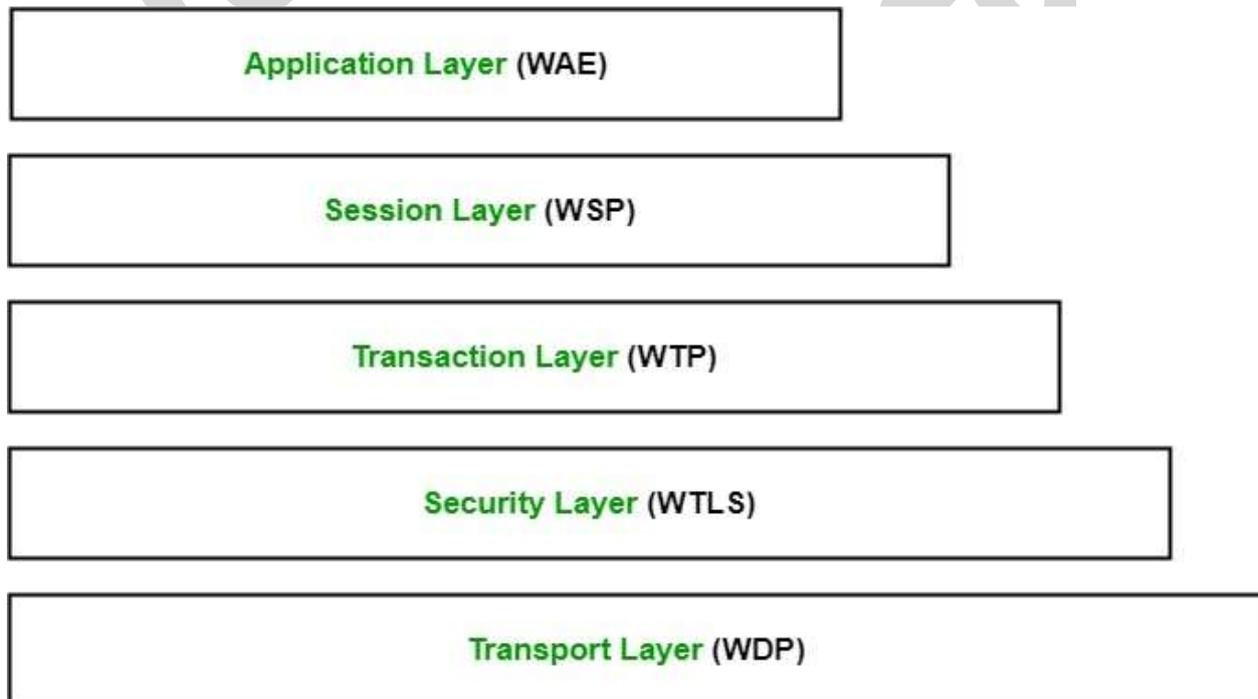


WAP Model:

The user opens the mini-browser in a mobile device. He selects a website that he wants to view. The mobile device sends the URL encoded request via network to a WAP gateway using WAP protocol.



The WAP gateway translates this WAP request into a conventional HTTP URL request and sends it over the internet. The request reaches to a specified Web server and it processes the request just as it would have processed any other request and sends the response back to the mobile device through WAP gateway in WML file which can be seen in the micro-browser.



**1. Application Layer:**

This layer contains the *Wireless Application Environment (WAE)*. It contains mobile device specifications and content development programming languages like WML.

**2. Session Layer:**

This layer contains *Wireless Session Protocol (WSP)*. It provides fast connection suspension and reconnection.

**3. Transaction Layer:**

This layer contains *Wireless Transaction Protocol (WTP)*. It runs on top of UDP (User Datagram Protocol) and is a part of TCP/IP and offers transaction support.



4. **Security Layer:**

This layer contains Wireless Transaction Layer Security (WTLS). It offers data integrity, privacy and authentication.

5. **Transport Layer:**

This layer contains Wireless Datagram Protocol. It presents consistent data format to higher layers of WAP protocol stack.

Topic 4

COMPONENT OF MOBILE COMMERCE

A mobile commerce system is very complex because it involves such a wide range of disciplines and technologies. In general, a mobile commerce system can be divided into six components: (1) mobile commerce applications, (2) mobile stations, (3) mobile middleware, (4) wireless networks, (5) wired networks, and (6) host computers.

To explain how these components work together, the following outline gives a brief description of a typical procedure that is initiated by a request submitted by a mobile user:

**1. Mobile commerce applications:** A content provider implements an application by providing two sets of programs: client-side programs, such as a user interface on a microbrowser, and server-side programs, such as database accesses and updating.

**2. Mobile stations:** Mobile stations present user interfaces to the end users, who specify their requests on the interfaces. The mobile stations then relay user requests to the other components and display the processing results later using the interfaces.

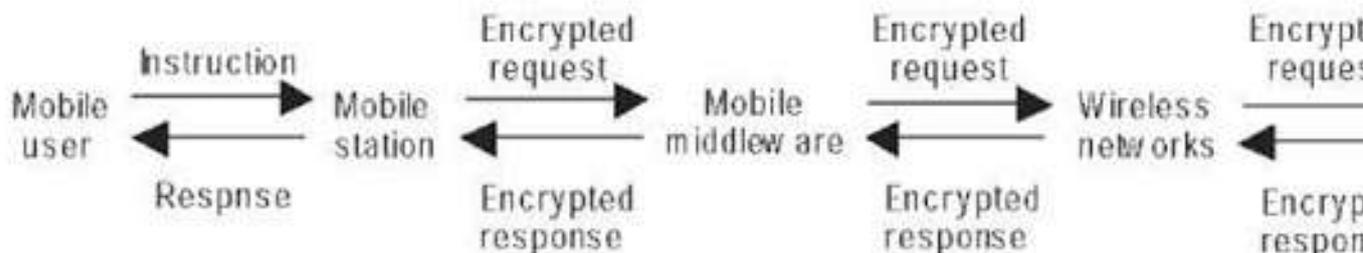
**3. Mobile middleware:** The major purpose of mobile middleware is to seamlessly and transparently map Internet contents to mobile stations that support a wide variety of operating systems, markup languages, microbrowsers, and protocols. Most mobile middleware also encrypts the communication in order to provide some level of security for transactions.

**4. Wireless networks:** Mobile commerce is possible mainly because of the availability of wireless networks. User requests are delivered to either the closest wireless access point (in a wireless local area network environment) or a base station (in a cellular network environment).

**5. Wired networks:** This component is optional for a mobile commerce system. However, most computers (servers) usually reside on wired networks such as the Internet, so user requests are routed to these servers using transport and/or security mechanisms provided by wired networks.

**6. Host computers:** This component is similar to the one used in electronic commerce, which includes three kinds of software. User requests are generally acted upon in this component.

**Figure 1. Flowchart of a user request processed in a mobile commerce system**



To better illustrate the above procedure, Figure 1 depicts a flowchart showing how a user request is processed by the components in a mobile commerce system (Leavitt, 2000).

**MOBILE COMMERCE SYSTEMS**



Since each component in a mobile commerce system is large enough to be a research area by itself, only elements in components that are specifically related to mobile commerce are explained in this article. Related research on mobile commerce systems can be found in the article by Varshney, Vetter, and Kalakota (2000).

### Mobile Commerce Applications

The applications of electronic commerce are already widespread; mobile commerce applications not only cover these but also include new ones. For example, some tasks that are not feasible for electronic commerce, such as mobile inventory tracking and dispatching, are possible for mobile commerce. Table 1 lists some of the major mobile commerce applications (Gordon & Gebauer, 2001; Sadeh, 2002), along with details of each.

### Mobile Stations

A mobile station or a mobile handheld device, such as a personal digital assistant (PDA) or Web-enabled cellular phone, may embrace many of the features of computers, telephone/fax, e-mails, and personal information managers (PIMs), such as calendars and address books, and networking features. A mobile station differs from a PC or notebook due to its limited network bandwidth, limited screen/body size, and mobility features. The limited network bandwidth prevents the display of most multimedia on a microbrowser, while the limited screen/body size restricts the mobile stations of today to either a stylus or keyboard version. Table 2 lists some major mobile station specifications, although several table entries may be incomplete as some of the information is classified as confidential due to business considerations.

**Table 1. Major mobile commerce applications**

Mobile Category	Major Applications	Clients
Commerce	Mobile transactions and payments	Businesses
Education	Mobile classrooms and labs	Schools and training centers
Enterprise resource planning	Resource management	All
Entertainment	Games/images/music/video downloads and online gaming	Entertainment industry
Health care	Accessing and updating patient records	Hospitals and nursing homes
Inventory tracking and dispatching	Product tracking and dispatching	Delivery services and transportation
Traffic	Global positioning, directions, and traffic advisories	Transportation and auto industries
Travel and ticketing	Travel management	Travel industry and ticket sales



**Table 2. Specifications of some major mobile stations**

Vendor & Device	Operating System	Processor	Installed RAM/ROM	Input Methods	Key Features
Compaq iPAQ H3870	MS Pocket PC 2002	206 MHz Intel StrongARM 32bit RISC	64 MB/32 MB	Touchscreen	Wireless email/Internet
Handspring Treo 300	Palm OS 3.5.2H	33 MHz Motorola Dragonball VZ	16 MB/8 MB	Keyboard/ Stylus	CDMA network
Motorola Accompli 009	Wisdom OS 5.0	33 MHz Motorola Dragonball VZ	8 MB/4 MB	Keyboard	GPRS network
Nokia 9290 Communicator	Symbian OS	32-bit ARM9 RISC	16 MB/8 MB	Keyboard	WAP
Nokia 6800	Series 40			Keyboard	Innovative keyboard integration
Palm i705	Palm OS 4.1	33 MHz Motorola Dragonball VZ	8 MB/4 MB	Stylus	Wireless Email/Internet
Samsung SPH-i330	Palm OS 4.1	66MHz Motorola Dragonball Super VZ	16 MB/8 MB	Touchscreen/ Stylus	Color screen
Sony Clie PEG-NR70V	Palm OS 4.1	66 MHz Motorola Dragon ball Super VZ	16 MB/8 MB	Keyboard/ Stylus/ Touchscreen	Multimedia
Sony Ericsson T68i			800KB	Keyboard	Multimedia Messaging Service
Toshiba E740	MS Pocket PC 2002	400 MHz Intel PXA250	64 MB/32 MB	Stylus/ Touchscreen	Wireless Internet
Sony Ericsson Z1010			32MB	Keyboard	MP3, MMS, WAP2.0



Mobile Middleware

The term middleware refers to the software layer between the operating system and the distributed applications that interact via the networks. The primary mission of a middleware layer is to hide the underlying networked environment's complexity by insulating applications from explicit protocol handling disjoint memories, data replication, network faults, and parallelism (Geihs, 2001). Mobile middleware translates requests from mobile stations to a host computer and adapts content from the host to the mobile station (Saha, Jamtgaard, & Villasenor, 2001). According to an article in Eurotechnology entitled Frequently asked questions about NTT-DoCoMo's i-mode (2000), 60% of the world's wireless Internet users use i-mode, 39% use WAP, and 1% use Palm middleware. Table 3 compares i-mode and WAP, the two major kinds of mobile middleware.

Wireless Networks

Network infrastructure provides essential voice and data communication capability for consumers and vendors in cyberspace. Evolving from electronic commerce (EC) to mobile commerce (MC), it is necessary for a wired network infrastructure, such as the Internet, to be augmented by wireless networks that support mobility for end users. From the perspective of mobile commerce, wireless networks can be categorized into wireless local area networks (WLANs) and wireless cellular networks.

WLAN technologies are suitable for office networks, home networks, personal area networks (PANs), and ad hoc networks. In a one-hop WLAN environment, where an access point (AP) acting as a router or switch is a part of a wired network, mobile devices connect directly to the AP through radio channels. Data packets are relayed by the AP to the other end of a network connection. If no APs are available, mobile devices can form a wireless ad hoc network among themselves and exchange data packets or perform business transactions as necessary. Many WLAN products are available on the market. In general, Bluetooth technology supports very limited coverage range and throughput. Thus it is only suitable for applications in personal area networks. In many parts of the world, the IEEE 802.11b (Wi-Fi) system is now the most popular wireless network and is used in offices, homes, and public spaces such as airports, shopping malls, and restaurants. However, many experts predict that with much higher transmission speeds, 802.11g will replace 802.11b in the near future.

**Table 3. Comparisons of WAP and i-mode**

	<b>WAP</b>	<b>i-mode</b>
Developer	WAP Forum	NTT DoCoMo
Function	A protocol	A complete mobile Internet service
Host Language	WML (Wireless Markup Language)	CHTML (Compact HTML)
Major Technology	WAP Gateway	TCP/IP modifications
Key Features	Widely adopted and flexible	Highest number of users and easy to use

Cellular system users can conduct mobile commerce operations through their cellular phones. Under this scenario, a cellular phone connects directly to the closest base station, where communication is relayed to the service site through a radio access network (RAN) and other fixed networks. Originally designed for voice-only communication, cellular systems are evolving from analog to digital, and from circuit-switched to packet-switched networks, in order to accommodate mobile commerce (data) applications. Currently, most of the cellular wireless networks in the world follow 2G or 2.5G standards. However, there is no doubt that, in the near future, 3G systems with quality-of-service



(QoS) capability will dominate wireless cellular services. The two main standards for 3G are Wideband CDMA (WCDMA), proposed by Ericsson, and CDMA2000, proposed by Qualcomm.

### **Host Computers**

**A host computer processes, produces, and stores all the information for mobile commerce applications. This component is similar to that used in an electronic commerce system because the host computers are usually not aware of differences among the targets, browsers or microbrowsers they serve. It is the application programs that are responsible for apprehending their clients and responding to them accordingly. Most of the mobile commerce application programs reside in this component, except for some client-side programs such as cookies. Usually this component contains three major elements: a Web server, a database server, and application programs and support software.**

### **FUTURE TRENDS**

**It is estimated that 50 million wireless phone users in the United States will use their handheld devices to authorize payment for premium content and physical goods at some point during the year of 2006. This represents 17% of the projected total population and 26% of all wireless users (The Yankee Group, 2001). Mobile commerce is an effective and convenient way to deliver electronic commerce to consumers from anywhere and at anytime. Realizing the advantages to be gained from mobile commerce, many major companies have begun to offer mobile commerce options for their customers in addition to the electronic commerce they already provide (Over 50% of large U.S. enterprises plan to implement a wireless/mobile solution by 2003, 2001).**

**However, without secure commercial information exchange and safe electronic financial transactions over mobile networks, neither service providers nor potential customers will trust mobile commerce systems. Mobile security and payment are hence crucial issues for mobile commerce. Security issues span the whole mobile commerce system, from one end to the other, from the top to the bottom network protocol stack, from machines to humans. For example, in WAP, security is provided through the Wireless Transport Layer Security (WTLS) protocol (in WAP 1.0) and IETF standard Transport Layer Security (TLS) protocol (in WAP 2.0). They provide data integrity, privacy, and authentication. One security problem, known as the "WAP Gap" is caused by the inclusion of the WAP gateway in a security session. That is, encrypted messages sent by end systems might temporarily become clear text on the WAP gateway when messages are processed. One solution is to make the WAP gateway resident within the enterprise (server) network (Ashley, Hinton, & Vandenwauver, 2001), where heavyweight security mechanisms can be enforced.**

**In an IEEE 802.11 WLAN, security is provided by a data link level protocol called Wired Equivalent Privacy (WEP). When it is enabled, each mobile host has a secret key that is shared with the base station. The encryption algorithm used in WEP is a synchronous stream cipher based on RC4. The ciphertext is generated by XORing the plaintext with a RC4 generated keystream. However, recently published literature has discovered methods for breaking this approach (Borisov, Goldberg, & Wagner, 2001; Fluhrer, Martin, & Shamir, 2001; Stubblefield, Ioannidis, & Rubin, 2002). The next version, 802.11i, is expected to have better security.**

**Payment on mobile commerce systems is another issue. Although the Secure Electronic Transaction (SET) protocol (SET Secure Electronic Transaction Specification, Version 1.0, 1997) is likely to become the global standard in the domain of electronic commerce over the Internet, a WAP client device normally does not have sufficient processing and memory capability to utilize SET software. A "thin" SET wallet approach (Jin, Ren, Feng, & Hua, 2002) has thus been proposed to adapt the SET protocol for WAP clients. Under the "thin" SET wallet model, most of the functionality of current "fat" SET wallets is moved to the wallet server. To support a SET payment, a WAP client installed with only a "thin" wallet securely connects with a wallet server, which communicates with other SET entities. When SET purchase requests arrive from the "thin" wallet, the wallet server takes over the responsibility of routing requests and managing digital keys and certificates.**



## CONCLUSION

The emerging wireless and mobile networks have extended electronic commerce to another research and application subject: mobile commerce. A mobile commerce system involves a range of disciplines and technologies. This level of complexity makes understanding and constructing a mobile commerce system an arduous task. To facilitate this process, this article divided a mobile commerce system into six components, which can be summarized as follows:

- **Mobile commerce applications:** Electronic commerce applications are already broad. Mobile commerce applications not only cover the existing applications, but also include new applications, which can be performed at any time and from anywhere by using mobile computing technology.
- **Mobile stations:** Mobile stations are limited by their small screens, limited memory, limited processing power, and low battery power, and suffer from wireless network transmission problems. Numerous mobile stations, such as PDAs or Web-enabled cellular phones, are available on the market, but most use one of three major operating systems: Palm OS, Microsoft Pocket PC, and Symbian OS. At this moment, Palm OS leads the market, although it faces a serious challenge from Pocket PC.
- **Mobile middleware:** WAP and i-mode are the two major kinds of mobile middleware. WAP is widely adopted and flexible, while i-mode has the highest number of users and is easy to use. It is difficult to predict which middleware will be the eventual winner in the end; it is more likely that the two will be blended somehow at some point in the future.
- **Wireless and wired networks:** Wireless communication capability supports mobility for end users in mobile commerce systems. Wireless LANs and cellular networks are major components used to provide radio communication channels so that mobile service is possible. In the WLAN category, the Wi-Fi standard with 11 Mbps throughput dominates the current market. It is expected that standards with much higher transmission speeds, such as 802.11g, will replace Wi-Fi in the near future. Compared to WLANs, cellular systems can provide longer transmission distances and greater radio coverage, but suffer from the drawback of much lower bandwidth (less than 1 Mbps). In the latest trend for cellular systems, 3G standards supporting wireless multimedia and high-bandwidth services are beginning to be deployed. WCDMA and CDMA2000 are likely to dominate the market in the future.
- **Host computers:** Host computers process and store all the information needed for mobile commerce applications, and most application programs can be found here. They include three major components: Web servers, database servers, and application programs and support software.  
An important trend for mobile commerce is enhancing mobile security mechanisms and payment methods. Mobile commerce systems can prosper only if information can be securely exchanged among end systems (consumers and vendors). Security issues (including payment) include data reliability, integrity, confidentiality, and authentication and are usually a crucial part of implementation in wireless protocols/systems. Solutions are updated frequently, due to the lack of a comprehensive wireless security infrastructure and standard. A unified approach has not yet emerged.

## KEY TERMS

**i-mode:** the full-color, always-on, and packet-switched Internet service for cellular phone users offered by NTT DoCoMo.

**Mobile Commerce:** the exchange or buying and selling of commodities, services, or information on the Internet (wired or wireless) through the use of mobile handheld devices.

**SET:** the Secure Electronic Transaction (SET) protocol is a technical standard designed to provide security for payment transactions among cardholders, merchants, payment gateways, and certification authorities in Internet.

**Third Generation (3G):** wireless system that can provide fairly high-speed (384 Kbps) packet-switched wide-area wireless Internet access to support multimedia applications.

**Wi-Fi:** IEEE 802.11b (Wi-Fi) is a wireless local area network standard. It operates in an unlicensed radio frequency band at 2.4 GHz and provides data access at 11 Mbps.



Wired Equivalent Privacy (WEP): a data link-level protocol that provides security for the IEEE 802.11 WLAN standards. The encryption algorithm used in WEP is a stream cipher based on  
Wireless Application Protocol (WAP): an open, global specification that allows users with mobile devices to easily access and interact with information and services instantly

#### Topic 5 mobile apps

Marketers have rolled out engaging and useful mobile applications that helped them better reach consumers. Mobile apps are a great way for retailers to increase sales.

Here are the top 10 mobile commerce applications of the second quarter, in alphabetical order. The apps were judged on creative, form of engagement and execution.

#### **Amazon**

Amazon has been a game-changer in the mobile commerce space for some time now.

Last month, the company bought its augmented reality bar code scanning app Flow Powered by Amazon to Android devices – a reflection of mobile’s growing importance for the in-store shopping experience.

Amazon’s bar code scanning app has been a hit among consumers and a fear among retailers.

While customers are increasingly using Amazon’s app to price compare, showrooming has become a challenge.

By bringing the app to the Android platform, Amazon is aiming to reach a broader audience.

Via the Android app, consumers can scan bar codes on the items on store shelves or simply point the device’s camera at a book or DVD and get an augmented reality overlay showing product information.

Users also see how much an item costs on Amazon and can click on buttons to purchase the item directly from Amazon.

The app also provides user reviews from Amazon and audio previews.

#### **Bloomingdale’s**

Bloomingdale’s has taken huge strides in the mobile space. Previously, the department store giant used SMS and QR codes to engage its in-store shoppers.

Earlier this year, Bloomingdale’s rolled out an iPhone and Android app to let fashion-savvy consumers shop the latest trends, as well as check prices and read product reviews.

Using the app, consumers can locate the nearest store to learn more about in-store events and special offers.

The app also features bar code scanning capabilities that let consumers create and manage their wedding registry and shop from the registries of their friends and family as well.

A mobile app such as this is a great way to not only increase sales, but drive in-store traffic as well.



It is important that that retailers have a mobile-optimized presence to better reach on-the-go shoppers.

### **Capital One**

It is important that marketers revamp their mobile applications and Capital One is a great example of a company that did it right.

Capital One updated its mobile banking app to enhance the customer experience by enabling customers to receive special offers from retailers such as Whole Foods and Starbucks.

The updates to the app were intended to provide customers with new and easier ways to manage their financial lives that they are looking for.

Through the new revamped app, consumers are able to redeem rewards for previously purchased travel, account credit and gift cards.

### **Crate and Barrel**

Bar code scanning technology has become increasingly popular in the past few months.

Crate and Barrel added a new mobile application to its repertoire last month to increase the company's in-store traffic, as well as accommodate consumers who are looking to manage their wedding and gift registry.

The Wedding & Gift registry iPhone app lets consumers create and edit their own registry, as well as scan bar codes in-store to add items.

Users can also see purchases made from their registry in real time and search for products using voice command.

An app such as this is a great way for retailers to get rid of registry scanner guns.

Consumers always have their mobile device on them, so by giving them an option to use their mobile device to scan items they want, it proves to be effective.

### **Denny's**

Denny's recently stepped into the mobile space with a new app that celebrates the restaurant chain's limited-time menu and offers consumers rewards when they complete challenges and check-in to the company's locations.

The app was a smart move for the company as it invites consumers to take part in its 50 State Challenge initiative that offers one lucky winner a chance to win multiple loyalty-based rewards including free Grand Slams for life.

When consumers check-in they will be able to unlock a digital state souvenir and a variety of badges, as well as special in-store offers and redeemable coupons.

Denny's is encouraging diners to check-in to as many locations as possible and accumulate milestone prizes.

By using a mobile application, Denny's is able to build engagement and drive awareness of its brand.

Additionally, mobile check-ins are a hot commodity right now.



Rewarding consumers is a smart move on the company's part and is a good incentive for them to continually use the mobile app.

**Domino's**

While it is very important to have a mobile presence in the United States, it is just important to have one internationally.

The pizza giant launched a mobile application that rewards consumers when they use it.

The Domigoals mobile app lets football fans vie for a chance to win prizes when goals are scored.

To vie for a chance to win prizes such as Domino's voucher codes, users can tap the app once a goal has been scored.

Having consumers interact with an app is essential and rewarding them every time they use it is a good way to keep them coming back.

**Lowe's**

Lowe's has been building its mobile portfolio to better accommodate on-the-go consumers.

In its latest effort, the home improvement retailer introduced an Android app that lets consumers shop the company's products.

The Lowe's Android app lets consumers find nearby stores and integrates with the company's My Lowe's program to let users buy items.

Additionally, the app lets consumers comparison shop and research while in-store and also includes a mobile bar code scanner that works with QR codes, UPC codes and Microsoft Tags.

It is important that marketers have a mobile presence on a variety of platforms, not just Apple's iOS.

By expanding its app to the Android platform, Lowe's is reaching a bigger audience.

**Orbitz**

Similar to Capital One, Orbitz relaunched its popular iPhone booking app to make it easier for consumers to book flights, hotels and car rentals via their smartphone.

The online travel agency's new app now features two filtered options that let users search by price, distance or ratings.

Additionally, through the updated app, users can view their itinerary, add an event to the device's calendar.

It is important that companies listen to customer needs and constantly look at ways to better their mobile offerings.

**P.F. Chang's**

It took a while for P.F. Chang's to enter the mobile ordering space. However, the company proved that it is never too late.

The fast casual restaurant chain's mobile app lets hungry diners order food from their handsets.



In addition to mobile ordering, the app is part of a bigger initiative that is aimed at building P.F. Chang's Warrior Rewards loyalty program. Consumers who download the app and sign up for the Warrior Rewards program can receive a free appetizer.

A mobile ordering app helps cement P.F. Chang's position in the mobile commerce space.

Nowadays, consumers do not want to wait in line to pay for their meals.

P.F. Chang's is able to accommodate its tech-savvy customers.

### Whole Foods

Whole Foods Market recently upped its mobile commerce game by rewarding shoppers who practice an ecofriendly lifestyle with mobile coupons.

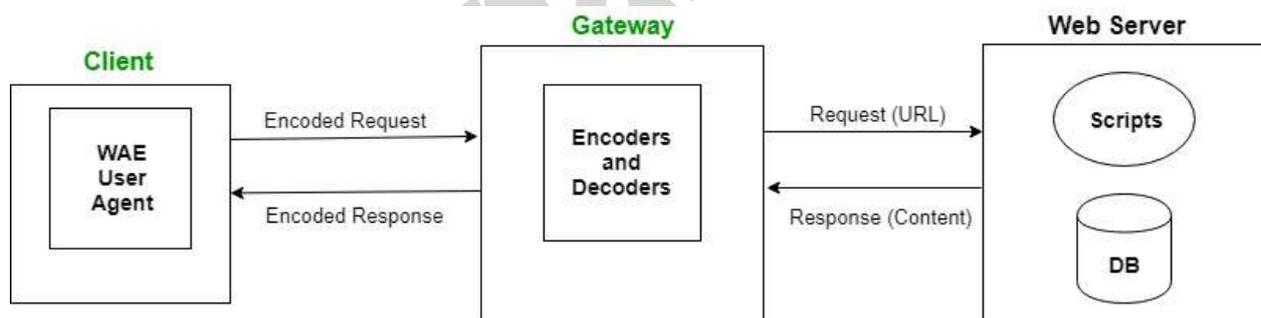
The initiative was part of a bigger campaign that aimed to increase awareness of poverty.

Whole Foods Market shoppers can earn the mobile coupons from companies such as Organic Valley, Stonyfield and Nature's Path by completing tasks via an iPhone application that is run by Whole Foods Market-owned nonprofit Whole Planet Foundation.

The mobile app is designed to help end world poverty through microcredits.

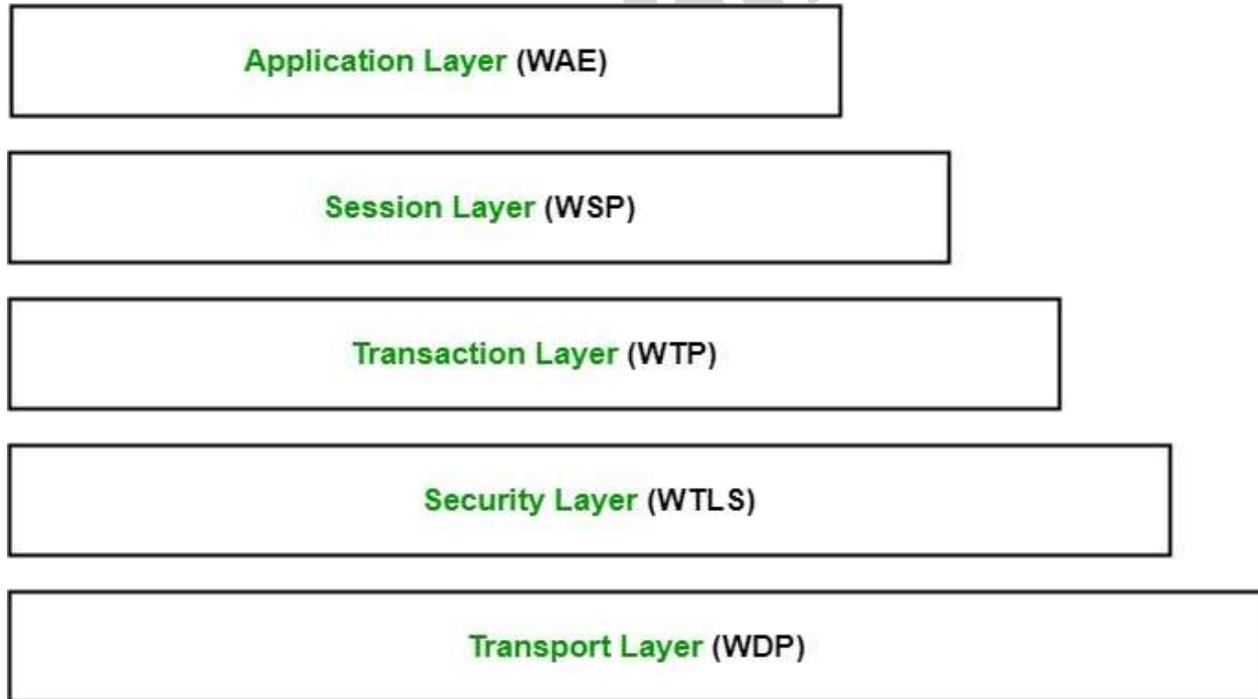
Using a mobile app to drive awareness is a smart move for the company, especially given the fact that more consumers are bound to participate if it is for a good cause.

Additionally, by providing an incentive – in this case coupons – mobile shoppers are more inclined to keep interacting with the mobile app going forward.





The WAP gateway translates this WAP request into a conventional HTTP URL request and sends it over the internet. The request reaches to a specified Web server and it processes the request just as it would have processed any other request and sends the response back to the mobile device through WAP gateway in WML file which can be seen in the micro-browser.



6. **Application** **Layer:**  
This layer contains the *Wireless Application Environment (WAE)*. It contains mobile device specifications and content development programming languages like WML.
7. **Session** **Layer:**  
This layer contains *Wireless Session Protocol (WSP)*. It provides fast connection suspension and reconnection.
8. **Transaction** **Layer:**  
This layer contains *Wireless Transaction Protocol (WTP)*. It runs on top of UDP (User Datagram Protocol) and is a part of TCP/IP and offers transaction support.
9. **Security** **Layer:**  
This layer contains *Wireless Transaction Layer Security (WTLS)*. It offers data integrity, privacy and authentication.
10. **Transport** **Layer:**  
This layer contains *Wireless Datagram Protocol*. It presents consistent data format to higher layers of WAP protocol stack.

Topic 4



A mobile commerce system is very complex because it involves such a wide range of disciplines and technologies. In general, a mobile commerce system **m-commerce (mobile commerce)**

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets. As a form of e-commerce, m-commerce enables users to access online shopping platforms without needing to use a desktop computer. Examples of m-commerce include in-app purchasing, mobile banking, virtual marketplace apps like the Amazon mobile app or a digital wallet such as Apple Pay, Android Pay and Samsung Pay.

Over time, content delivery over wireless devices has become faster, more secure and scalable. As of 2017 the use of m-commerce accounted for 34.5% of e-commerce sales. The industries affected most by m-commerce include:

- Financial services, which includes mobile banking (when customers use their handheld devices to access their accounts and pay their bills) as well as brokerage services, in which stock quotes can be displayed and trading conducted from the same handheld device.
- Telecommunications, in which service changes, bill payment and account reviews can all be performed from the same handheld device.
- Service and retail, as consumers are given the ability to place and pay for orders on-the-fly.
- Information services, which include the delivery of financial news, sports figures and traffic updates to a single mobile device.

### **Types of m-commerce**

M-commerce can be categorized by function as either mobile shopping, mobile banking or mobile payments. Mobile shopping allows for a customer to purchase a product from a mobile device, using an application such as Amazon, or over a web app. A subcategory of mobile shopping is app commerce, which is a transaction that takes place over a native app. Mobile banking includes any handheld technology that enables customers to conduct financial transactions. This is typically done through a secure, dedicated app provided by the banking institution. Mobile payments enable users to buy products in-person using a mobile device. Digital wallets, such as Apple Pay, allow a customer to buy a product without needing to swipe a card or pay with physical cash.

### **How mobile commerce works**

With most m-commerce enabled platforms, the mobile device is connected to a wireless network that can be used to conduct online product purchases. For those in charge of developing an m-commerce

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application, important KPIs to monitor include the total mobile traffic, total amount of traffic on the application, average order value and the value of orders over time. Similarly, tracking the mobile add to cart rate will help developers see if users are becoming customers. M-commerce developers may also be interested in logging average page loading times, mobile cart conversion rates and SMS subscriptions.

In terms of mobile payment products specifically, they operate through a form of peer-to-peer (P2P) sharing. Once a mobile device is paired with a bank card's information, the phone can be waved over a payment terminal to pay for a product. This contactless payment using a mobile device is possible due to the use of Near Field Communication (NFC).

### **Advantages and disadvantages of mobile commerce**

The advantages of m-commerce include:

- Added customer retention by being more easily accessible.
- More convenience for customers in comparing prices, reading reviews and making purchases without the need of a desktop computer.
- Wider variety of products and services.
- Automates a businesses' point of customer contact and sales.

Disadvantages of m-commerce include:

- A poorly executed mobile experience can deter customers from making purchases.
- Mobile payment options are not available in every geographic location and may not support every type of digital wallet.
- Businesses must know and comply with tax laws and regulations of all countries they ship to (some businesses will avoid this by only allowing purchases and shipping from their country of origin).



Topic 2 OVERVIEW OF MOBILE COMMERCE

An 012

- In the early days, mobile phones were used to access the internet in some countries. Consumers have been using mobile to make remote purchases since the day it became available for general use.

Mobile commerce has been in existence since 1997. Coca-Cola was first installed two mobile-phone enabled vending machines in Finland and accepted the payment via SMS text messages. In 1997, Merita Bank of Finland launched the first mobile phone-based banking services.

M-commerce is the innovation in electronic market. With the help of m-commerce, marketers are getting opportunities to grow their business across the globe. M-commerce has brought drastic changes in the buying pattern of consumers. At the moment, most m-commerce transactions are being made to buy mobile add-ons, like games, apps, ringtones and screensavers etc.

The latest Martec International annual IT report suggests that, *"The top 100 UK retailers investment in e-commerce and m-commerce has grown from 17% to 23% in 2011, overtaking spending on store systems. The report also suggests that 16% of the retailers already have an m-commerce platform and a further 12% are planning to adopt m-commerce in the near future."*

There has been exponential growth in smartphones and tablets users and the number is growing every day. Over half a million apps, new digital retail interface experiences and mobile use persists to be inhibited by the slow propagation of a better-quality User Experience Design (UXD). This is the biggest hurdle we face as we move towards the future of mobile.

Developing good user experience for mobile users is quite different from web. UXD needs more simplified telegraphic communication that is more dependent on visual cues than words. Content should be optimized properly to give users great user experience. Developers create separate applications for each mobile platform and operating systems.

M-commerce is growing steadily with wireless handheld accessories and many more applications are released to facilitate anywhere shopping. So for m-commerce, the signs are encouraging, but for retailers, competition will increase and they will be facing many challenges and issues. Technology is taking the things in different directions, for instance mobile optimized sites, smartphone apps, loyalty, location based services, QR codes, contactless/payment.

The growth of m-commerce is undeniable. With the evolution of 4G mobile technology, the future of m-commerce seems extremely bright because several experiments are going on to introduce the upgraded

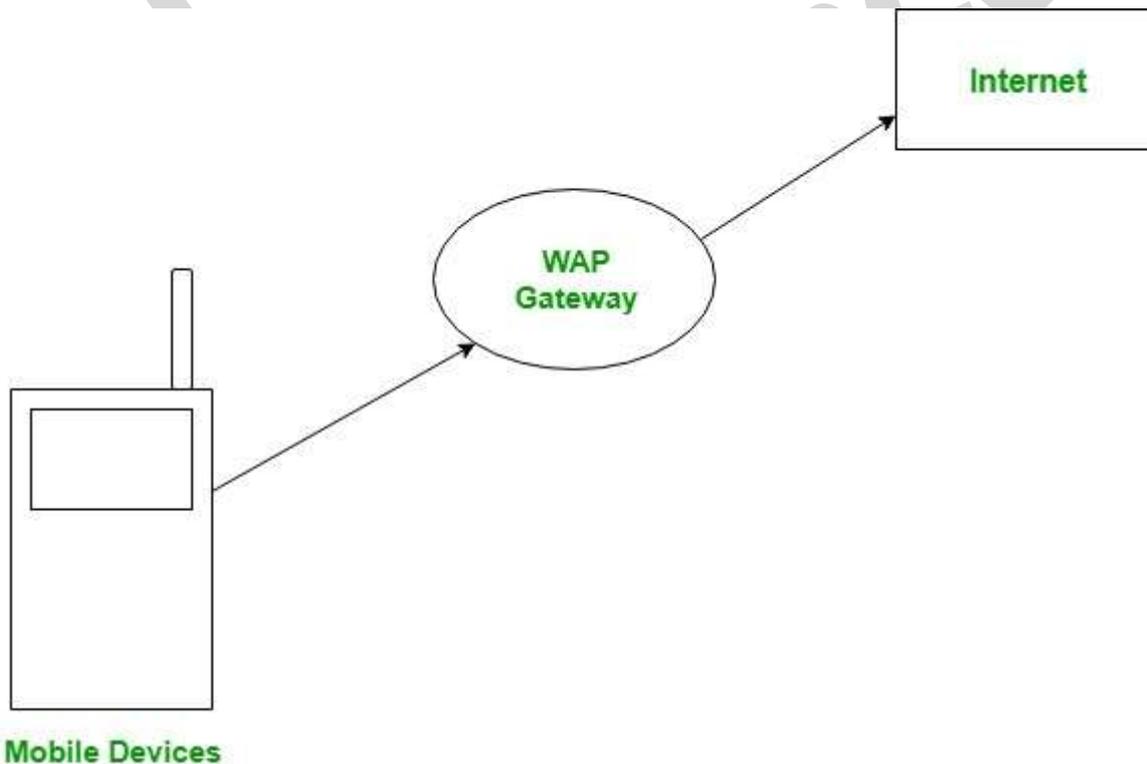


the versions of mobile devices. The booming popularity of mobile has forced corporate world to expand the m-commerce platform to reach the masses and expand business.

Topic 3

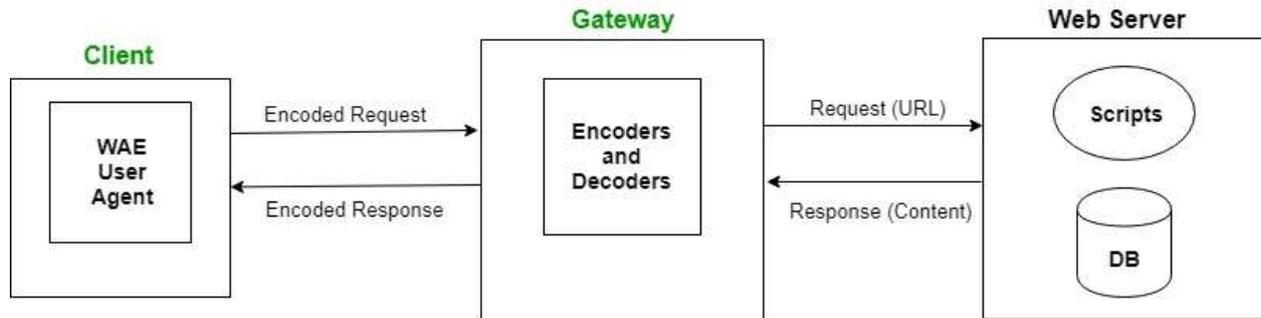
Wireless Application Protocol

**WAP** stands for **Wireless Application Protocol**. It is a protocol designed for micro-browsers and it enables the access of internet in the mobile devices. It uses the mark-up language WML (Wireless Markup Language and not HTML), WML is defined as XML 1.0 application. It enables creating web applications for mobile devices. In 1998, *WAP Forum* was founded by Ericson, Motorola, Nokia and Unwired Planet whose aim was to standardize the various wireless technologies via protocols. WAP protocol was resulted by the joint efforts of the various members of WAP Forum. In 2002, WAP forum was merged with various other forums of the industry resulting in the formation of **Open Mobile Alliance (OMA)**.

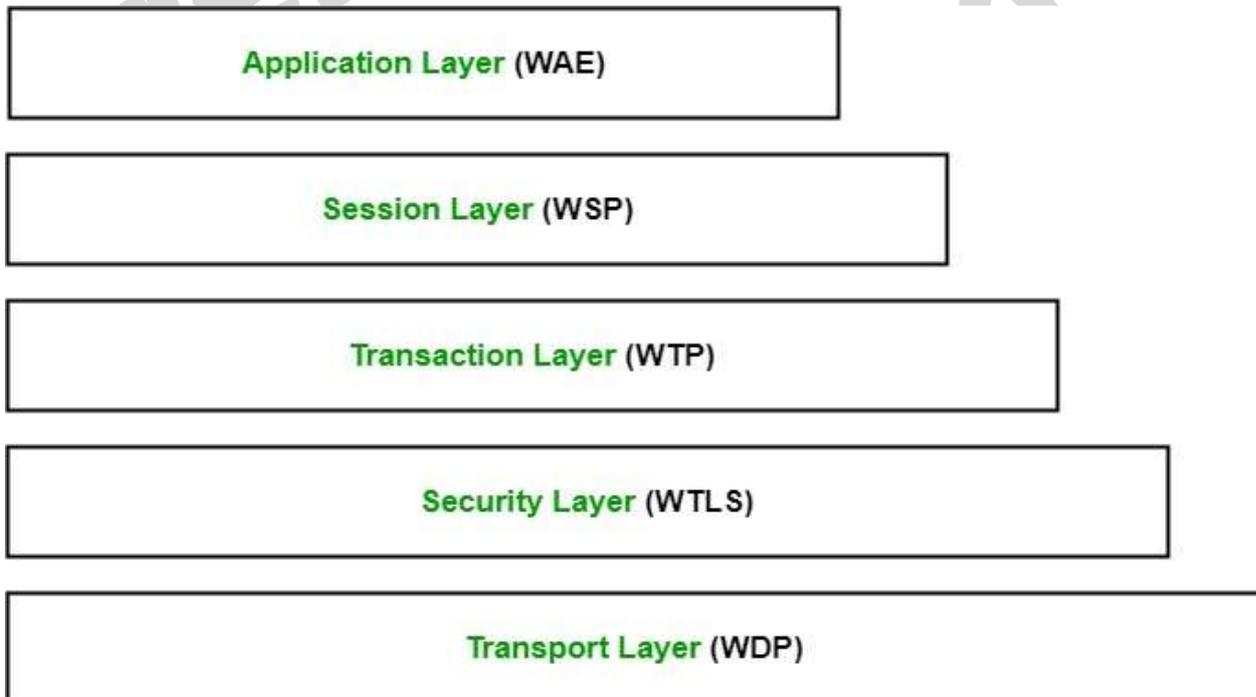


WAP Model:

The user opens the mini-browser in a mobile device. He selects a website that he wants to view. The mobile device sends the URL encoded request via network to a WAP gateway using WAP protocol.



The WAP gateway translates this WAP request into a conventional HTTP URL request and sends it over the internet. The request reaches a specified Web server and it processes the request just as it would have processed any other request and sends the response back to the mobile device through WAP gateway in WML file which can be seen in the micro-browser.



**11. Application Layer:**

This layer contains the *Wireless Application Environment (WAE)*. It contains mobile device specifications and content development programming languages like WML.

**12. Session Layer:**

This layer contains *Wireless Session Protocol (WSP)*. It provides fast connection suspension and reconnection.

**13. Transaction Layer:**

This layer contains *Wireless Transaction Protocol (WTP)*. It runs on top of UDP (User Datagram Protocol) and is a part of TCP/IP and offers transaction support.



14. **Security Layer:**

This layer contains *Wireless Transaction Layer Security (WTLS)*. It offers data integrity, privacy and authentication.

15. **Transport Layer:**

This layer contains *Wireless Datagram Protocol*. It presents consistent data format to higher layers of WAP protocol stack.

Topic 4

COMPONENT OF MOBILE COMMERCE

A mobile commerce system is very complex because it involves such a wide range of disciplines and technologies. In general, a mobile commerce system can be divided into six components: (1) mobile commerce applications, (2) mobile stations, (3) mobile middleware, (4) wireless networks, (5) wired networks, and (6) host computers.

**To explain how these components work together, the following outline gives a brief description of a typical procedure that is initiated by a request submitted by a mobile user:**

**1. Mobile commerce applications:** A content provider implements an application by providing two sets of programs: client-side programs, such as a user interface on a microbrowser, and server-side programs, such as database accesses and updating.

**2. Mobile stations:** Mobile stations present user interfaces to the end users, who specify their requests on the interfaces. The mobile stations then relay user requests to the other components and display the processing results later using the interfaces.

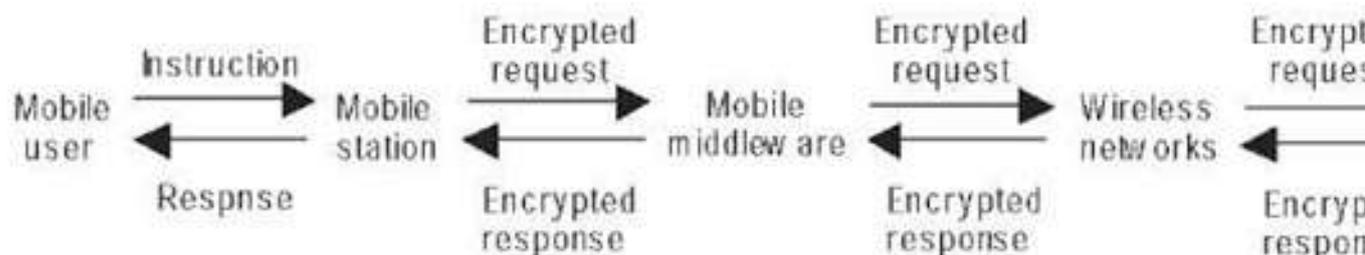
**3. Mobile middleware:** The major purpose of mobile middleware is to seamlessly and transparently map Internet contents to mobile stations that support a wide variety of operating systems, markup languages, microbrowsers, and protocols. Most mobile middleware also encrypts the communication in order to provide some level of security for transactions.

**4. Wireless networks:** Mobile commerce is possible mainly because of the availability of wireless networks. User requests are delivered to either the closest wireless access point (in a wireless local area network environment) or a base station (in a cellular network environment).

**5. Wired networks:** This component is optional for a mobile commerce system. However, most computers (servers) usually reside on wired networks such as the Internet, so user requests are routed to these servers using transport and/or security mechanisms provided by wired networks.

**6. Host computers:** This component is similar to the one used in electronic commerce, which includes three kinds of software. User requests are generally acted upon in this component.

**Figure 1. Flowchart of a user request processed in a mobile commerce system**



To better illustrate the above procedure, Figure 1 depicts a flowchart showing how a user request is processed by the components in a mobile commerce system (Leavitt, 2000).

**MOBILE COMMERCE SYSTEMS**



Since each component in a mobile commerce system is large enough to be a research area by itself, only elements in components that are specifically related to mobile commerce are explained in this article. Related research on mobile commerce systems can be found in the article by Varshney, Vetter, and Kalakota (2000).

### Mobile Commerce Applications

The applications of electronic commerce are already widespread; mobile commerce applications not only cover these but also include new ones. For example, some tasks that are not feasible for electronic commerce, such as mobile inventory tracking and dispatching, are possible for mobile commerce. Table 1 lists some of the major mobile commerce applications (Gordon & Gebauer, 2001; Sadeh, 2002), along with details of each.

### Mobile Stations

A mobile station or a mobile handheld device, such as a personal digital assistant (PDA) or Web-enabled cellular phone, may embrace many of the features of computers, telephone/fax, e-mails, and personal information managers (PIMs), such as calendars and address books, and networking features. A mobile station differs from a PC or notebook due to its limited network bandwidth, limited screen/body size, and mobility features. The limited network bandwidth prevents the display of most multimedia on a microbrowser, while the limited screen/body size restricts the mobile stations of today to either a stylus or keyboard version. Table 2 lists some major mobile station specifications, although several table entries may be incomplete as some of the information is classified as confidential due to business considerations.

**Table 1. Major mobile commerce applications**

Mobile Category	Major Applications	Clients
Commerce	Mobile transactions and payments	Businesses
Education	Mobile classrooms and labs	Schools and training centers
Enterprise resource planning	Resource management	All
Entertainment	Games/images/music/video downloads and online gaming	Entertainment industry
Health care	Accessing and updating patient records	Hospitals and nursing homes
Inventory tracking and dispatching	Product tracking and dispatching	Delivery services and transportation
Traffic	Global positioning, directions, and traffic advisories	Transportation and auto industries
Travel and ticketing	Travel management	Travel industry and ticket sales



**Table 2. Specifications of some major mobile stations**

Vendor & Device	Operating System	Processor	Installed RAM/ROM	Input Methods	Key Features
Compaq iPAQ H3870	MS Pocket PC 2002	206 MHz Intel StrongARM 32bit RISC	64 MB/32 MB	Touchscreen	Wireless email/Internet
Handspring Treo 300	Palm OS 3.5.2H	33 MHz Motorola Dragonball VZ	16 MB/8 MB	Keyboard/ Stylus	CDMA network
Motorola Accompli 009	Wisdom OS 5.0	33 MHz Motorola Dragonball VZ	8 MB/4 MB	Keyboard	GPRS network
Nokia 9290 Communicator	Symbian OS	32-bit ARM9 RISC	16 MB/8 MB	Keyboard	WAP
Nokia 6800	Series 40			Keyboard	Innovative keyboard integration
Palm i705	Palm OS 4.1	33 MHz Motorola Dragonball VZ	8 MB/4 MB	Stylus	Wireless Email/Internet
Samsung SPH-i330	Palm OS 4.1	66MHz Motorola Dragonball Super VZ	16 MB/8 MB	Touchscreen/ Stylus	Color screen
Sony Clie PEG-NR70V	Palm OS 4.1	66 MHz Motorola Dragon ball Super VZ	16 MB/8 MB	Keyboard/ Stylus/ Touchscreen	Multimedia
Sony Ericsson T68i			800KB	Keyboard	Multimedia Messaging Service
Toshiba E740	MS Pocket PC 2002	400 MHz Intel PXA250	64 MB/32 MB	Stylus/ Touchscreen	Wireless Internet
Sony Ericsson Z1010			32MB	Keyboard	MP3, MMS, WAP2.0



Mobile Middleware

The term middleware refers to the software layer between the operating system and the distributed applications that interact via the networks. The primary mission of a middleware layer is to hide the underlying networked environment's complexity by insulating applications from explicit protocol handling disjoint memories, data replication, network faults, and parallelism (Geihs, 2001). Mobile middleware translates requests from mobile stations to a host computer and adapts content from the host to the mobile station (Saha, Jamtgaard, & Villasenor, 2001). According to an article in Eurotechnology entitled Frequently asked questions about NTT-DoCoMo's i-mode (2000), 60% of the world's wireless Internet users use i-mode, 39% use WAP, and 1% use Palm middleware. Table 3 compares i-mode and WAP, the two major kinds of mobile middleware.

Wireless Networks

Network infrastructure provides essential voice and data communication capability for consumers and vendors in cyberspace. Evolving from electronic commerce (EC) to mobile commerce (MC), it is necessary for a wired network infrastructure, such as the Internet, to be augmented by wireless networks that support mobility for end users. From the perspective of mobile commerce, wireless networks can be categorized into wireless local area networks (WLANs) and wireless cellular networks.

WLAN technologies are suitable for office networks, home networks, personal area networks (PANs), and ad hoc networks. In a one-hop WLAN environment, where an access point (AP) acting as a router or switch is a part of a wired network, mobile devices connect directly to the AP through radio channels. Data packets are relayed by the AP to the other end of a network connection. If no APs are available, mobile devices can form a wireless ad hoc network among themselves and exchange data packets or perform business transactions as necessary. Many WLAN products are available on the market. In general, Bluetooth technology supports very limited coverage range and throughput. Thus it is only suitable for applications in personal area networks. In many parts of the world, the IEEE 802.11b (Wi-Fi) system is now the most popular wireless network and is used in offices, homes, and public spaces such as airports, shopping malls, and restaurants. However, many experts predict that with much higher transmission speeds, 802.11g will replace 802.11b in the near future.

**Table 3. Comparisons of WAP and i-mode**

	<b>WAP</b>	<b>i-mode</b>
Developer	WAP Forum	NTT DoCoMo
Function	A protocol	A complete mobile Internet service
Host Language	WML (Wireless Markup Language)	CHTML (Compact HTML)
Major Technology	WAP Gateway	TCP/IP modifications
Key Features	Widely adopted and flexible	Highest number of users and easy to use

Cellular system users can conduct mobile commerce operations through their cellular phones. Under this scenario, a cellular phone connects directly to the closest base station, where communication is relayed to the service site through a radio access network (RAN) and other fixed networks. Originally designed for voice-only communication, cellular systems are evolving from analog to digital, and from circuit-switched to packet-switched networks, in order to accommodate mobile commerce (data) applications. Currently, most of the cellular wireless networks in the world follow 2G or 2.5G standards. However, there is no doubt that, in the near future, 3G systems with quality-of-service



(QoS) capability will dominate wireless cellular services. The two main standards for 3G are Wideband CDMA (WCDMA), proposed by Ericsson, and CDMA2000, proposed by Qualcomm.

### **Host Computers**

**A host computer processes, produces, and stores all the information for mobile commerce applications. This component is similar to that used in an electronic commerce system because the host computers are usually not aware of differences among the targets, browsers or microbrowsers they serve. It is the application programs that are responsible for apprehending their clients and responding to them accordingly. Most of the mobile commerce application programs reside in this component, except for some client-side programs such as cookies. Usually this component contains three major elements: a Web server, a database server, and application programs and support software.**

### **FUTURE TRENDS**

**It is estimated that 50 million wireless phone users in the United States will use their handheld devices to authorize payment for premium content and physical goods at some point during the year of 2006. This represents 17% of the projected total population and 26% of all wireless users (The Yankee Group, 2001). Mobile commerce is an effective and convenient way to deliver electronic commerce to consumers from anywhere and at anytime. Realizing the advantages to be gained from mobile commerce, many major companies have begun to offer mobile commerce options for their customers in addition to the electronic commerce they already provide (Over 50% of large U.S. enterprises plan to implement a wireless/mobile solution by 2003, 2001).**

**However, without secure commercial information exchange and safe electronic financial transactions over mobile networks, neither service providers nor potential customers will trust mobile commerce systems. Mobile security and payment are hence crucial issues for mobile commerce. Security issues span the whole mobile commerce system, from one end to the other, from the top to the bottom network protocol stack, from machines to humans. For example, in WAP, security is provided through the Wireless Transport Layer Security (WTLS) protocol (in WAP 1.0) and IETF standard Transport Layer Security (TLS) protocol (in WAP 2.0). They provide data integrity, privacy, and authentication. One security problem, known as the “WAP Gap” is caused by the inclusion of the WAP gateway in a security session. That is, encrypted messages sent by end systems might temporarily become clear text on the WAP gateway when messages are processed. One solution is to make the WAP gateway resident within the enterprise (server) network (Ashley, Hinton, & Vandenwauver, 2001), where heavyweight security mechanisms can be enforced.**

**In an IEEE 802.11 WLAN, security is provided by a data link level protocol called Wired Equivalent Privacy (WEP). When it is enabled, each mobile host has a secret key that is shared with the base station. The encryption algorithm used in WEP is a synchronous stream cipher based on RC4. The ciphertext is generated by XORing the plaintext with a RC4 generated keystream. However, recently published literature has discovered methods for breaking this approach (Borisov, Goldberg, & Wagner, 2001; Fluhrer, Martin, & Shamir, 2001; Stubblefield, Ioannidis, & Rubin, 2002). The next version, 802.11i, is expected to have better security.**

**Payment on mobile commerce systems is another issue. Although the Secure Electronic Transaction (SET) protocol (SET Secure Electronic Transaction Specification, Version 1.0, 1997) is likely to become the global standard in the domain of electronic commerce over the Internet, a WAP client device normally does not have sufficient processing and memory capability to utilize SET software. A “thin” SET wallet approach (Jin, Ren, Feng, & Hua, 2002) has thus been proposed to adapt the SET protocol for WAP clients. Under the “thin” SET wallet model, most of the functionality of current “fat” SET wallets is moved to the wallet server. To support a SET payment, a WAP client installed with only a “thin” wallet securely connects with a wallet server, which communicates with other SET entities. When SET purchase requests arrive from the “thin” wallet, the wallet server takes over the responsibility of routing requests and managing digital keys and certificates.**



## CONCLUSION

The emerging wireless and mobile networks have extended electronic commerce to another research and application subject: mobile commerce. A mobile commerce system involves a range of disciplines and technologies. This level of complexity makes understanding and constructing a mobile commerce system an arduous task. To facilitate this process, this article divided a mobile commerce system into six components, which can be summarized as follows:

- **Mobile commerce applications:** Electronic commerce applications are already broad. Mobile commerce applications not only cover the existing applications, but also include new applications, which can be performed at any time and from anywhere by using mobile computing technology.
- **Mobile stations:** Mobile stations are limited by their small screens, limited memory, limited processing power, and low battery power, and suffer from wireless network transmission problems. Numerous mobile stations, such as PDAs or Web-enabled cellular phones, are available on the market, but most use one of three major operating systems: Palm OS, Microsoft Pocket PC, and Symbian OS. At this moment, Palm OS leads the market, although it faces a serious challenge from Pocket PC.
- **Mobile middleware:** WAP and i-mode are the two major kinds of mobile middleware. WAP is widely adopted and flexible, while i-mode has the highest number of users and is easy to use. It is difficult to predict which middleware will be the eventual winner in the end; it is more likely that the two will be blended somehow at some point in the future.
- **Wireless and wired networks:** Wireless communication capability supports mobility for end users in mobile commerce systems. Wireless LANs and cellular networks are major components used to provide radio communication channels so that mobile service is possible. In the WLAN category, the Wi-Fi standard with 11 Mbps throughput dominates the current market. It is expected that standards with much higher transmission speeds, such as 802.11g, will replace Wi-Fi in the near future. Compared to WLANs, cellular systems can provide longer transmission distances and greater radio coverage, but suffer from the drawback of much lower bandwidth (less than 1 Mbps). In the latest trend for cellular systems, 3G standards supporting wireless multimedia and high-bandwidth services are beginning to be deployed. WCDMA and CDMA2000 are likely to dominate the market in the future.
- **Host computers:** Host computers process and store all the information needed for mobile commerce applications, and most application programs can be found here. They include three major components: Web servers, database servers, and application programs and support software. An important trend for mobile commerce is enhancing mobile security mechanisms and payment methods. Mobile commerce systems can prosper only if information can be securely exchanged among end systems (consumers and vendors). Security issues (including payment) include data reliability, integrity, confidentiality, and authentication and are usually a crucial part of implementation in wireless protocols/systems. Solutions are updated frequently, due to the lack of a comprehensive wireless security infrastructure and standard. A unified approach has not yet emerged.

## KEY TERMS

**i-mode:** the full-color, always-on, and packet-switched Internet service for cellular phone users offered by NTT DoCoMo.

**Mobile Commerce:** the exchange or buying and selling of commodities, services, or information on the Internet (wired or wireless) through the use of mobile handheld devices.

**SET:** the Secure Electronic Transaction (SET) protocol is a technical standard designed to provide security for payment transactions among cardholders, merchants, payment gateways, and certification authorities in Internet.

**Third Generation (3G):** wireless system that can provide fairly high-speed (384 Kbps) packet-switched wide-area wireless Internet access to support multimedia applications.

**Wi-Fi:** IEEE 802.11b (Wi-Fi) is a wireless local area network standard. It operates in an unlicensed radio frequency band at 2.4 GHz and provides data access at 11 Mbps.



Wired Equivalent Privacy (WEP): a data link-level protocol that provides security for the IEEE 802.11 WLAN standards. The encryption algorithm used in WEP is a stream cipher based on  
Wireless Application Protocol (WAP): an open, global specification that allows users with mobile devices to easily access and interact with information and services instantly

#### Topic 5 mobile apps

Marketers have rolled out engaging and useful mobile applications that helped them better reach consumers. Mobile apps are a great way for retailers to increase sales.

Here are the top 10 mobile commerce applications of the second quarter, in alphabetical order. The apps were judged on creative, form of engagement and execution.

#### **Amazon**

Amazon has been a game-changer in the mobile commerce space for some time now.

Last month, the company bought its augmented reality bar code scanning app Flow Powered by Amazon to Android devices – a reflection of mobile’s growing importance for the in-store shopping experience.

Amazon’s bar code scanning app has been a hit among consumers and a fear among retailers.

While customers are increasingly using Amazon’s app to price compare, showrooming has become a challenge.

By bringing the app to the Android platform, Amazon is aiming to reach a broader audience.

Via the Android app, consumers can scan bar codes on the items on store shelves or simply point the device’s camera at a book or DVD and get an augmented reality overlay showing product information.

Users also see how much an item costs on Amazon and can click on buttons to purchase the item directly from Amazon.

The app also provides user reviews from Amazon and audio previews.

#### **Bloomingdale’s**

Bloomingdale’s has taken huge strides in the mobile space. Previously, the department store giant used SMS and QR codes to engage its in-store shoppers.

Earlier this year, Bloomingdale’s rolled out an iPhone and Android app to let fashion-savvy consumers shop the latest trends, as well as check prices and read product reviews.

Using the app, consumers can locate the nearest store to learn more about in-store events and special offers.

The app also features bar code scanning capabilities that let consumers create and manage their wedding registry and shop from the registries of their friends and family as well.

A mobile app such as this is a great way to not only increase sales, but drive in-store traffic as well.



It is important that that retailers have a mobile-optimized presence to better reach on-the-go shoppers.

### **Capital One**

It is important that marketers revamp their mobile applications and Capital One is a great example of a company that did it right.

Capital One updated its mobile banking app to enhance the customer experience by enabling customers to receive special offers from retailers such as Whole Foods and Starbucks.

The updates to the app were intended to provide customers with new and easier ways to manage their financial lives that they are looking for.

Through the new revamped app, consumers are able to redeem rewards for previously purchased travel, account credit and gift cards.

### **Crate and Barrel**

Bar code scanning technology has become increasingly popular in the past few months.

Crate and Barrel added a new mobile application to its repertoire last month to increase the company's in-store traffic, as well as accommodate consumers who are looking to manage their wedding and gift registry.

The Wedding & Gift registry iPhone app lets consumers create and edit their own registry, as well as scan bar codes in-store to add items.

Users can also see purchases made from their registry in real time and search for products using voice command.

An app such as this is a great way for retailers to get rid of registry scanner guns.

Consumers always have their mobile device on them, so by giving them an option to use their mobile device to scan items they want, it proves to be effective.

### **Denny's**

Denny's recently stepped into the mobile space with a new app that celebrates the restaurant chain's limited-time menu and offers consumers rewards when they complete challenges and check-in to the company's locations.

The app was a smart move for the company as it invites consumers to take part in its 50 State Challenge initiative that offers one lucky winner a chance to win multiple loyalty-based rewards including free Grand Slams for life.

When consumers check-in they will be able to unlock a digital state souvenir and a variety of badges, as well as special in-store offers and redeemable coupons.

Denny's is encouraging diners to check-in to as many locations as possible and accumulate milestone prizes.

By using a mobile application, Denny's is able to build engagement and drive awareness of its brand.

Additionally, mobile check-ins are a hot commodity right now.



Rewarding consumers is a smart move on the company's part and is a good incentive for them to continually use the mobile app.

### **Domino's**

While it is very important to have a mobile presence in the United States, it is just important to have one internationally.

The pizza giant launched a mobile application that rewards consumers when they use it.

The Domigoals mobile app lets football fans vie for a chance to win prizes when goals are scored.

To vie for a chance to win prizes such as Domino's voucher codes, users can tap the app once a goal has been scored.

Having consumers interact with an app is essential and rewarding them every time they use it is a good way to keep them coming back.

### **Lowe's**

Lowe's has been building its mobile portfolio to better accommodate on-the-go consumers.

In its latest effort, the home improvement retailer introduced an Android app that lets consumers shop the company's products.

The Lowe's Android app lets consumers find nearby stores and integrates with the company's My Lowe's program to let users buy items.

Additionally, the app lets consumers comparison shop and research while in-store and also includes a mobile bar code scanner that works with QR codes, UPC codes and Microsoft Tags.

It is important that marketers have a mobile presence on a variety of platforms, not just Apple's iOS.

By expanding its app to the Android platform, Lowe's is reaching a bigger audience.

### **Orbitz**

Similar to Capital One, Orbitz relaunched its popular iPhone booking app to make it easier for consumers to book flights, hotels and car rentals via their smartphone.

The online travel agency's new app now features two filtered options that let users search by price, distance or ratings.

Additionally, through the updated app, users can view their itinerary, add an event to the device's calendar.

It is important that companies listen to customer needs and constantly look at ways to better their mobile offerings.

### **P.F. Chang's**

It took a while for P.F. Chang's to enter the mobile ordering space. However, the company proved that it is never too late.

The fast casual restaurant chain's mobile app lets hungry diners order food from their handsets.



In addition to mobile ordering, the app is part of a bigger initiative that is aimed at building P.F. Chang's Warrior Rewards loyalty program. Consumers who download the app and sign up for the Warrior Rewards program can receive a free appetizer.

A mobile ordering app helps cement P.F. Chang's position in the mobile commerce space.

Nowadays, consumers do not want to wait in line to pay for their meals.

P.F. Chang's is able to accommodate its tech-savvy customers.

### Whole Foods

Whole Foods Market recently upped its mobile commerce game by rewarding shoppers who practice an ecofriendly lifestyle with mobile coupons.

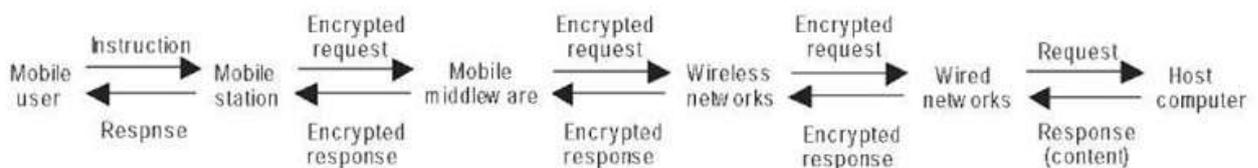
The initiative was part of a bigger campaign that aimed to increase awareness of poverty.

Whole Foods Market shoppers can earn the mobile coupons from companies such as Organic Valley, Stonyfield and Nature's Path by completing tasks via an iPhone application that is run by Whole Foods Market-owned nonprofit Whole Planet Foundation.

The mobile app is designed to help end world poverty through microcredits.

Using a mobile app to drive awareness is a smart move for the company, especially given the fact that more consumers are bound to participate if it is for a good cause.

Additionally, by providing an incentive – in this case coupons – mobile shoppers are more inclined to keep interacting with the mobile app going forward.



To better illustrate the above procedure, Figure 1 depicts a flowchart showing how a user request is processed by the components in a mobile commerce system (Leavitt, 2000).

### MOBILE COMMERCE SYSTEMS

Since each component in a mobile commerce system is large enough to be a research area by itself, only elements in components that are specifically related to mobile commerce are explained in this article. Related research on mobile commerce systems can be found in the article by Varshney, Vetter, and Kalakota (2000).

### Mobile Commerce Applications



The applications of electronic commerce are already widespread; mobile commerce applications not only cover these but also include new ones. For example, some tasks that are not feasible for electronic commerce, such as mobile inventory tracking and dispatching, are possible for mobile commerce. Table 1 lists some of the major mobile commerce applications (Gordon & Gebauer, 2001; Sadeh, 2002), along with details of each.

Mobile Stations

A mobile station or a mobile handheld device, such as a personal digital assistant (PDA) or Web-enabled cellular phone, may embrace many of the features of computers, telephone/fax, e-mails, and personal information managers (PIMs), such as calendars and address books, and networking features. A mobile station differs from a PC or notebook due to its limited network bandwidth, limited screen/body size, and mobility features. The limited network bandwidth prevents the display of most multimedia on a microbrowser, while the limited screen/body size restricts the mobile stations of today to either a stylus or keyboard version. Table 2 lists some major mobile station specifications, although several table entries may be incomplete as some of the information is classified as confidential due to business considerations.

Table 1. Major mobile commerce applications

Table with 3 columns: Mobile Category, Major Applications, Clients. Rows include Commerce, Education, Enterprise resource planning, Entertainment, Health care, Inventory tracking and dispatching, Traffic, and Travel and ticketing.

Table 2. Specifications of some major mobile stations

Table with 6 columns: Vendor & Device, Operating System, Processor, Installed RAM/ROM, Input Methods, Key Features. Rows include Compaq iPAQ MS Pocket PC 2002 and Handspring Treo Palm OS.



300	3.5.2H	Dragonball VZ		Stylus	
Motorola Accompli 009	Wisdom OS 5.0	33 MHz Motorola Dragonball VZ	8 MB/4 MB	Keyboard	GPRS network
Nokia 9290 Communicator	Symbian OS	32-bit ARM9 RISC	16 MB/8 MB	Keyboard	WAP
Nokia 6800	Series 40			Keyboard	Innovative keyboard integration
Palm i705	Palm OS 4.1	33 MHz Motorola Dragonball VZ	8 MB/4 MB	Stylus	Wireless Email/Internet
Samsung i330	SPH-Palm OS 4.1	66MHz Motorola Dragonball Super VZ	16 MB/8 MB	Touchscreen/ Stylus	Color screen
Sony Clie PEG-NR70V	Palm OS 4.1	66 MHz Motorola Dragon ball Super VZ	16 MB/8 MB	Keyboard/ Stylus/ Touchscreen	Multimedia
Sony Ericsson T68i			800KB	Keyboard	Multimedia Messaging Service
Toshiba E740	MS Pocket PC 2002	400 MHz Intel PXA250	64 MB/32 MB	Stylus/ Touchscreen	Wireless Internet
Sony Ericsson Z1010			32MB	Keyboard	MP3, MMS, WAP2.0

**Mobile Middleware**

**The term middleware refers to the software layer between the operating system and the distributed applications that interact via the networks. The primary mission of a middleware layer is to hide the underlying networked environment’s complexity by insulating applications from explicit protocol handling disjoint memories, data replication, network faults, and parallelism (Geihs, 2001). Mobile middleware translates requests from mobile stations to a host computer and adapts content from the host to the mobile station (Saha, Jamtgaard, & Villasenor, 2001). According to an article in Eurotechnology entitled Frequently asked questions about NTT-DoCoMo’s i-mode (2000), 60%of the world’s wireless Internet users use i-mode, 39% use WAP, and 1% use Palm middleware. Table 3 compares i-mode and WAP, the two major kinds of mobile middleware.**



### Wireless Networks

Network infrastructure provides essential voice and data communication capability for consumers and vendors in cyberspace. Evolving from electronic commerce (EC) to mobile commerce (MC), it is necessary for a wired network infrastructure, such as the Internet, to be augmented by wireless networks that support mobility for end users. From the perspective of mobile commerce, wireless networks can be categorized into wireless local area networks (WLANs) and wireless cellular networks.

WLAN technologies are suitable for office networks, home networks, personal area networks (PANs), and ad hoc networks. In a one-hop WLAN environment, where an access point (AP) acting as a router or switch is a part of a wired network, mobile devices connect directly to the AP through radio channels. Data packets are relayed by the AP to the other end of a network connection. If no APs are available, mobile devices can form a wireless ad hoc network among themselves and exchange data packets or perform business transactions as necessary. Many WLAN products are available on the market. In general, Bluetooth technology supports very limited coverage range and throughput. Thus it is only suitable for applications in personal area networks. In many parts of the world, the IEEE 802.11b (Wi-Fi) system is now the most popular wireless network and is used in offices, homes, and public spaces such as airports, shopping malls, and restaurants. However, many experts predict that with much higher transmission speeds, 802.11g will replace 802.11b in the near future.

**Table 3. Comparisons of WAP and i-mode**

	<b>WAP</b>	<b>i-mode</b>
Developer	WAP Forum	NTT DoCoMo
Function	A protocol	A complete mobile Internet service
Host Language	WML (Wireless Markup Language)	CHTML (Compact HTML)
Major Technology	WAP Gateway	TCP/IP modifications
Key Features	Widely adopted and flexible	Highest number of users and easy to use

Cellular system users can conduct mobile commerce operations through their cellular phones. Under this scenario, a cellular phone connects directly to the closest base station, where communication is relayed to the service site through a radio access network (RAN) and other fixed networks. Originally designed for voice-only communication, cellular systems are evolving from analog to digital, and from circuit-switched to packet-switched networks, in order to accommodate mobile commerce (data) applications. Currently, most of the cellular wireless networks in the world follow 2G or 2.5G standards. However, there is no doubt that, in the near future, 3G systems with quality-of-service (QoS) capability will dominate wireless cellular services. The two main standards for 3G are Wideband CDMA (WCDMA), proposed by Ericsson, and CDMA2000, proposed by Qualcomm.

### Host Computers

A host computer processes, produces, and stores all the information for mobile commerce applications. This component is similar to that used in an electronic commerce system because the host computers are usually not aware of differences among the targets, browsers or microbrowsers they serve. It is the application programs that are responsible for apprehending their clients and responding to them accordingly. Most of the mobile commerce application programs reside in this component, except for some client-side programs such as cookies. Usually this component contains three major elements: a Web server, a database server, and application programs and support software.



### FUTURE TRENDS

#### **m-commerce (mobile commerce)**

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets. As a form of e-commerce, m-commerce enables users to access online shopping platforms without needing to use a desktop computer. Examples of m-commerce include in-app purchasing, mobile banking, virtual marketplace apps like the Amazon mobile app or a digital wallet such as Apple Pay, Android Pay and Samsung Pay.

Over time, content delivery over wireless devices has become faster, more secure and scalable. As of 2017 the use of m-commerce accounted for 34.5% of e-commerce sales. The industries affected most by m-commerce include:

- Financial services, which includes mobile banking (when customers use their handheld devices to access their accounts and pay their bills) as well as brokerage services, in which stock quotes can be displayed and trading conducted from the same handheld device.
- Telecommunications, in which service changes, bill payment and account reviews can all be performed from the same handheld device.
- Service and retail, as consumers are given the ability to place and pay for orders on-the-fly.
- Information services, which include the delivery of financial news, sports figures and traffic updates to a single mobile device.

#### **Types of m-commerce**

M-commerce can be categorized by function as either mobile shopping, mobile banking or mobile payments. Mobile shopping allows for a customer to purchase a product from a mobile device, using an application such as Amazon, or over a web app. A subcategory of mobile shopping is app commerce, which is a transaction that takes place over a native app. Mobile banking includes any handheld technology that enables customers to conduct financial transactions. This is typically done through a secure, dedicated app provided by the banking institution. Mobile payments enable users to buy products in-person using a mobile device. Digital wallets, such as Apple Pay, allow a customer to buy a product without needing to swipe a card or pay with physical cash.

#### **How mobile commerce works**



With most m-commerce enabled platforms, the mobile device is connected to a wireless network that can be used to conduct online product purchases. For those in charge of developing an m-commerce application, important KPIs to monitor include the total mobile traffic, total amount of traffic on the application, average order value and the value of orders over time. Similarly, tracking the mobile add to cart rate will help developers see if users are becoming customers. M-commerce developers may also be interested in logging average page loading times, mobile cart conversion rates and SMS subscriptions.

In terms of mobile payment products specifically, they operate through a form of peer-to-peer (P2P) sharing. Once a mobile device is paired with a bank card's information, the phone can be waved over a payment terminal to pay for a product. This contactless payment using a mobile device is possible due to the use of Near Field Communication (NFC).

### **Advantages and disadvantages of mobile commerce**

The advantages of m-commerce include:

- Added customer retention by being more easily accessible.
- More convenience for customers in comparing prices, reading reviews and making purchases without the need of a desktop computer.
- Wider variety of products and services.
- Automates a businesses' point of customer contact and sales.

Disadvantages of m-commerce include:

- A poorly executed mobile experience can deter customers from making purchases.
- Mobile payment options are not available in every geographic location and may not support every type of digital wallet.
- Businesses must know and comply with tax laws and regulations of all countries they ship to (some businesses will avoid this by only allowing purchases and shipping from their country of origin).

### **Topic 2 OVERVIEW OF MOBILE COMMERCE**



An 012

- In the early days, mobile phones were used to access the internet in some countries. Consumers have been using mobile to make remote purchases since the day it became available for general use.

Mobile commerce has been in existence since 1997. Coca-Cola was first installed two mobile-phone enabled vending machines in Finland and accepted the payment via SMS text messages. In 1997, Merita Bank of Finland launched the first mobile phone-based banking services.

M-commerce is the innovation in electronic market. With the help of m-commerce, marketers are getting opportunities to grow their business across the globe. M-commerce has brought drastic changes in the buying pattern of consumers. At the moment, most m-commerce transactions are being made to buy mobile add-ons, like games, apps, ringtones and screensavers etc.

The latest Martec International annual IT report suggests that, *“The top 100 UK retailers investment in e-commerce and m-commerce has grown from 17% to 23% in 2011, overtaking spending on store systems. The report also suggests that 16% of the retailers already have an m-commerce platform and a further 12% are planning to adopt m-commerce in the near future.”*

There has been exponential growth in smartphones and tablets users and the number is growing every day. Over half a million apps, new digital retail interface experiences and mobile use persists to be inhibited by the slow propagation of a better-quality User Experience Design (UXD). This is the biggest hurdle we face as we move towards the future of mobile.

Developing good user experience for mobile users is quite different from web. UXD needs more simplified telegraphic communication that is more dependent on visual cues than words. Content should be optimized properly to give users great user experience. Developers create separate applications for each mobile platform and operating systems.

M-commerce is growing steadily with wireless handheld accessories and many more applications are released to facilitate anywhere shopping. So for m-commerce, the signs are encouraging, but for retailers, competition will increase and they will be facing many challenges and issues. Technology is taking the things in different directions, for instance mobile optimized sites, smartphone apps, loyalty, location based services, QR codes, contactless/payment.

The growth of m-commerce is undeniable. With the evolution of 4G mobile technology, the future of m-commerce seems extremely bright because several experiments are going on to introduce the upgraded the versions of mobile devices. The booming popularity of mobile has forced corporate world to expand the m-commerce platform to reach the masses and expand business.

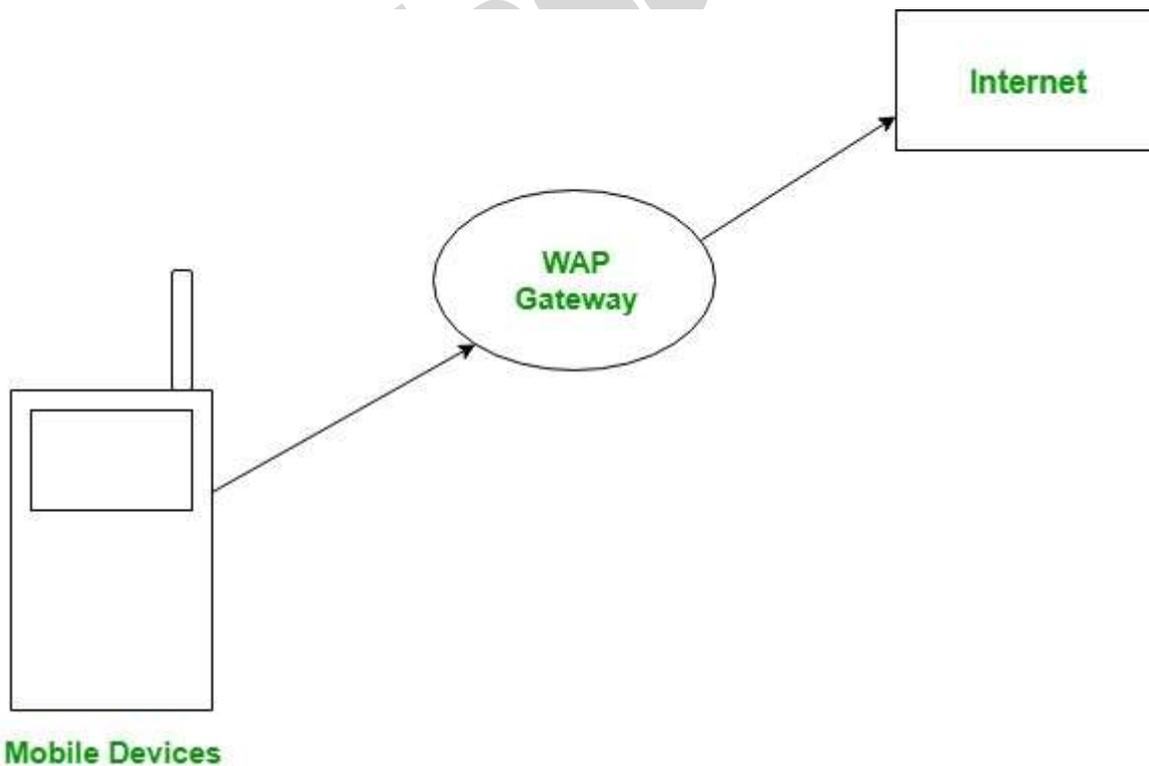
### Topic 3

#### Wireless Application Protocol

**WAP** stands for **Wireless Application Protocol**. It is a protocol designed for micro-browsers and it enables the access of internet in the mobile devices. It uses the mark-up language WML (Wireless Markup Language and not HTML), WML is defined as XML 1.0 application. It enables creating web

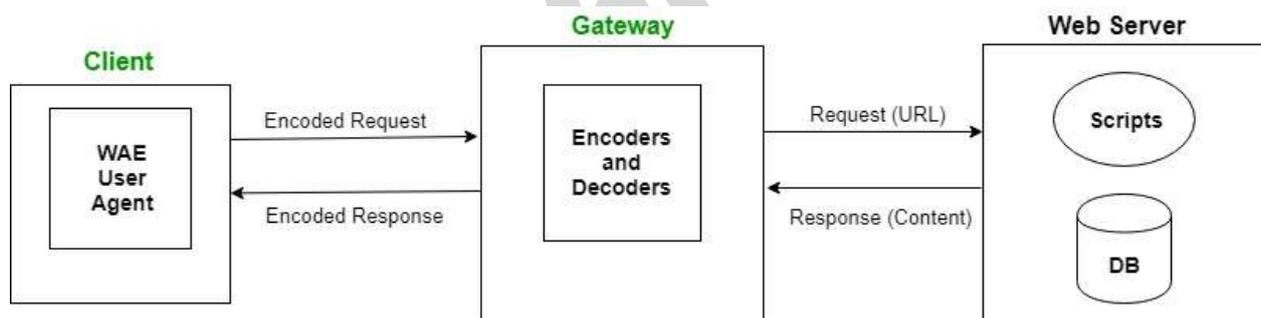


applications for mobile devices. In 1998, WAP Forum was founded by Ericson, Motorola, Nokia and Unwired Planet whose aim was to standardize the various wireless technologies via protocols. WAP protocol was resulted by the joint efforts of the various members of WAP Forum. In 2002, WAP forum was merged with various other forums of the industry resulting in the formation of **Open Mobile Alliance (OMA)**.



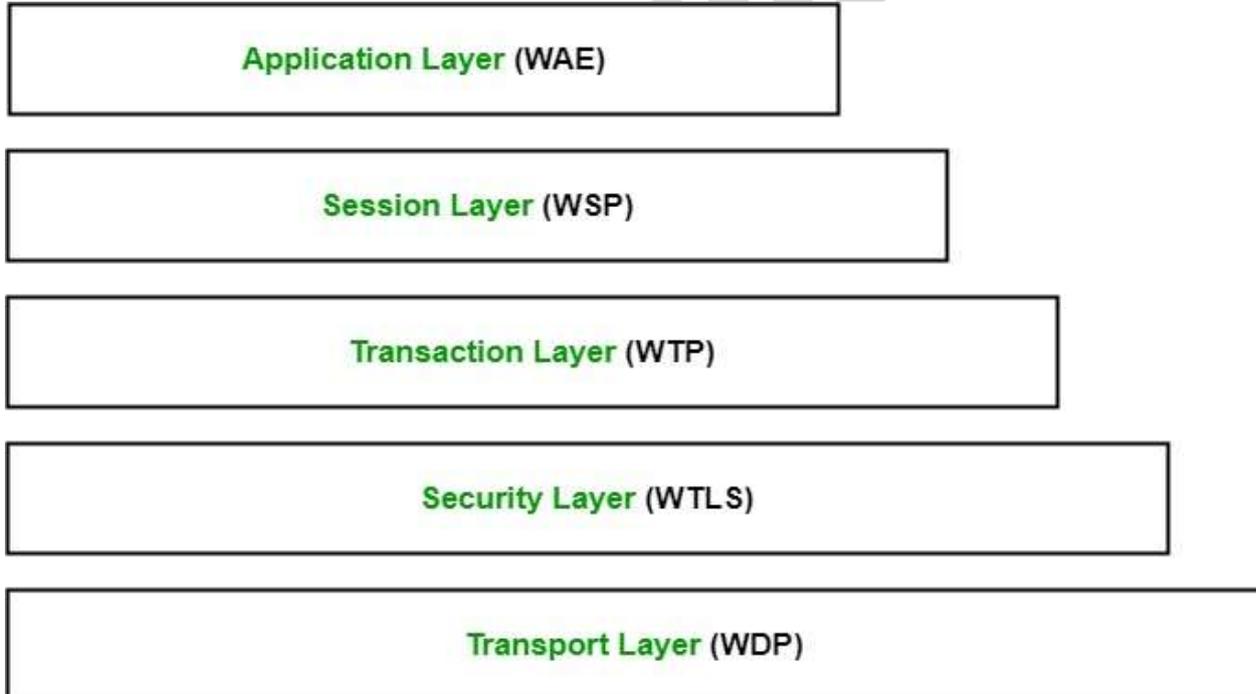
**WAP Model:**

The user opens the mini-browser in a mobile device. He selects a website that he wants to view. The mobile device sends the URL encoded request via network to a WAP gateway using WAP protocol.





The WAP gateway translates this WAP request into a conventional HTTP URL request and sends it over the internet. The request reaches to a specified Web server and it processes the request just as it would have processed any other request and sends the response back to the mobile device through WAP gateway in WML file which can be seen in the micro-browser.



**16. Application Layer:**

This layer contains the *Wireless Application Environment (WAE)*. It contains mobile device specifications and content development programming languages like WML.

**17. Session Layer:**

This layer contains *Wireless Session Protocol (WSP)*. It provides fast connection suspension and reconnection.

**18. Transaction Layer:**

This layer contains *Wireless Transaction Protocol (WTP)*. It runs on top of UDP (User Datagram Protocol) and is a part of TCP/IP and offers transaction support.

**19. Security Layer:**

This layer contains *Wireless Transaction Layer Security (WTLS)*. It offers data integrity, privacy and authentication.

**20. Transport Layer:**

This layer contains *Wireless Datagram Protocol*. It presents consistent data format to higher layers of WAP protocol stack.

Topic 4

### COMPONENT OF MOBILE COMMERCE

A mobile commerce system is very complex because it involves such a wide range of disciplines and technologies. In general, a mobile commerce system can be divided into six components: (1) mobile



commerce applications, (2) mobile stations, (3) mobile middleware, (4) wireless networks, (5) wired networks, and (6) host computers.

**To explain how these components work together, the following outline gives a brief description of a typical procedure that is initiated by a request submitted by a mobile user:**

**1. Mobile commerce applications:** A content provider implements an application by providing two sets of programs: client-side programs, such as a user interface on a microbrowser, and server-side programs, such as database accesses and updating.

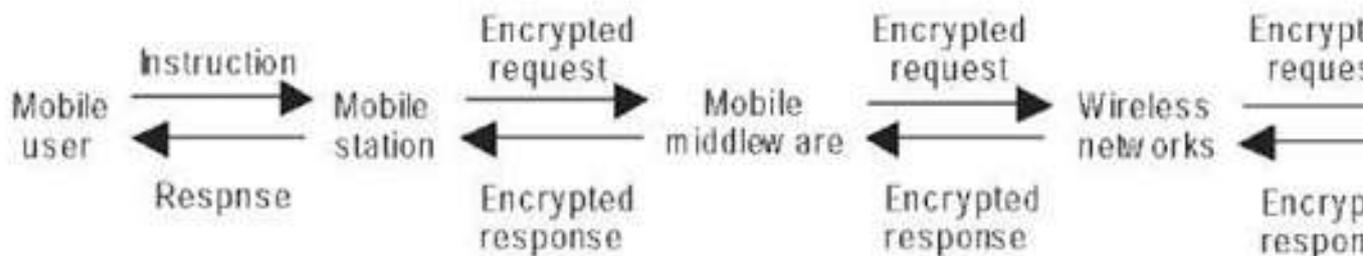
**2. Mobile stations:** Mobile stations present user interfaces to the end users, who specify their requests on the interfaces. The mobile stations then relay user requests to the other components and display the processing results later using the interfaces.

**3. Mobile middleware:** The major purpose of mobile middleware is to seamlessly and transparently map Internet contents to mobile stations that support a wide variety of operating systems, markup languages, microbrowsers, and protocols. Most mobile middleware also encrypts the communication in order to provide some level of security for transactions.

**4. Wireless networks:** Mobile commerce is possible mainly because of the availability of wireless networks. User requests are delivered to either the closest wireless access point (in a wireless local area network environment) or a base station (in a cellular network environment).

**5. Wired networks:** This component is optional for a mobile commerce system. However, most computers (servers) usually reside on wired networks such as the Internet, so user requests are routed to these servers using transport and/or security mechanisms provided by wired networks. 6. Host computers: This component is similar to the one used in electronic commerce, which includes three kinds of software. User requests are generally acted upon in this component.

**Figure 1. Flowchart of a user request processed in a mobile commerce system**



To better illustrate the above procedure, Figure 1 depicts a flowchart showing how a user request is processed by the components in a mobile commerce system (Leavitt, 2000).

### **MOBILE COMMERCE SYSTEMS**

Since each component in a mobile commerce system is large enough to be a research area by itself, only elements in components that are specifically related to mobile commerce are explained in this article. Related research on mobile commerce systems can be found in the article by Varshney, Vetter, and Kalakota (2000).

### **Mobile Commerce Applications**

The applications of electronic commerce are already widespread; mobile commerce applications not only cover these but also include new ones. For example, some tasks that are not feasible for electronic commerce, such as mobile inventory tracking and dispatching, are possible for mobile commerce. Table 1 lists some of the major mobile commerce applications (Gordon & Gebauer, 2001; Sadeh, 2002), along with details of each.



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**Table 1. Major mobile commerce applications**

Mobile Category	Major Applications	Clients
Commerce	Mobile transactions and payments	Businesses
Education	Mobile classrooms and labs	Schools and training centers
Enterprise resource planning	Resource management	All
Entertainment	Games/images/music/video downloads and online gaming	Entertainment industry
Health care	Accessing and updating patient records	Hospitals and nursing homes
Inventory tracking and dispatching	Product tracking and dispatching	Delivery services and transportation
Traffic	Global positioning, directions, and traffic advisories	Transportation and auto industries
Travel and ticketing	Travel management	Travel industry and ticket sales

**Table 2. Specifications of some major mobile stations**

Vendor & Device	Operating System	Processor	Installed RAM/ROM	Input Methods	Key Features
Compaq iPAQ H3870	MS Pocket PC 2002	206 MHz Intel StrongARM 32bit RISC	64 MB/32 MB	Touchscreen	Wireless email/Internet
Handspring Treo 300	Palm OS 3.5.2H	33 MHz Motorola Dragonball VZ	16 MB/8 MB	Keyboard/Stylus	CDMA network
Motorola	Wisdom OS	33 MHz Motorola	8 MB/4 MB	Keyboard	GPRS network



**B.Com.III Year**

**Subject Online Marketing**

Accompli 009	5.0	Dragonball VZ			
Nokia 9290 Communicator	Symbian OS	32-bit ARM9 RISC	16 MB/8 MB	Keyboard	WAP
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**Mobile Middleware**

**The term middleware refers to the software layer between the operating system and the distributed applications that interact via the networks.** The primary mission of a middleware layer is to hide the underlying networked environment’s complexity by insulating applications from explicit protocol handling disjoint memories, data replication, network faults, and parallelism (Geihs, 2001). Mobile middleware translates requests from mobile stations to a host computer and adapts content from the host to the mobile station (Saha, Jamtgaard, & Villasenor, 2001). According to an article in Eurotechnology entitled Frequently asked questions about NTT-DoCoMo’s i-mode (2000), 60% of the world’s wireless Internet users use i-mode, 39% use WAP, and 1% use Palm middleware. Table 3 compares i-mode and WAP, the two major kinds of mobile middleware.

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### FUTURE TRENDS



It is estimated that 50 million wireless phone users in the United States will use their handheld devices to authorize payment for premium content and physical goods at some point during the year of 2006. This represents 17% of the projected total population and 26% of all wireless users (The Yankee Group, 2001). Mobile commerce is an effective and convenient way to deliver electronic commerce to consumers from anywhere and at anytime. Realizing the advantages to be gained from mobile commerce, many major companies have begun to offer mobile commerce options for their customers in addition to the electronic commerce they already provide (Over 50% of large U.S. enterprises plan to implement a wireless/mobile solution by 2003, 2001).

However, without secure commercial information exchange and safe electronic financial transactions over mobile networks, neither service providers nor potential customers will trust mobile commerce systems. Mobile security and payment are hence crucial issues for mobile commerce. Security issues span the whole mobile commerce system, from one end to the other, from the top to the bottom network protocol stack, from machines to humans. For example, in WAP, security is provided through the Wireless Transport Layer Security (WTLS) protocol (in WAP 1.0) and IETF standard Transport Layer Security (TLS) protocol (in WAP 2.0). They provide data integrity, privacy, and authentication. One security problem, known as the “WAP Gap” is caused by the inclusion of the WAP gateway in a security session. That is, encrypted messages sent by end systems might temporarily become clear text on the WAP gateway when messages are processed. One solution is to make the WAP gateway resident within the enterprise (server) network (Ashley, Hinton, & Vandenwauver, 2001), where heavyweight security mechanisms can be enforced.

In an IEEE 802.11 WLAN, security is provided by a data link level protocol called Wired Equivalent Privacy (WEP). When it is enabled, each mobile host has a secret key that is shared with the base station. The encryption algorithm used in WEP is a synchronous stream cipher based on RC4. The ciphertext is generated by XORing the plaintext with a RC4 generated keystream. However, recently published literature has discovered methods for breaking this approach (Borisov, Goldberg, & Wagner, 2001; Fluhrer, Martin, & Shamir, 2001; Stubblefield, Ioannidis, & Rubin, 2002). The next version, 802.11i, is expected to have better security.

Payment on mobile commerce systems is another issue. Although the Secure Electronic Transaction (SET) protocol (SET Secure Electronic Transaction Specification, Version 1.0, 1997) is likely to become the global standard in the domain of electronic commerce over the Internet, a WAP client device normally does not have sufficient processing and memory capability to utilize SET software. A “thin” SET wallet approach (Jin, Ren, Feng, & Hua, 2002) has thus been proposed to adapt the SET protocol for WAP clients. Under the “thin” SET wallet model, most of the functionality of current “fat” SET wallets is moved to the wallet server. To support a SET payment, a WAP client installed with only a “thin” wallet securely connects with a wallet server, which communicates with other SET entities. When SET purchase requests arrive from the “thin” wallet, the wallet server takes over the responsibility of routing requests and managing digital keys and certificates.

## CONCLUSION

The emerging wireless and mobile networks have extended electronic commerce to another research and application subject: mobile commerce. A mobile commerce system involves a range of disciplines and technologies. This level of complexity makes understanding and constructing a mobile commerce system an arduous task. To facilitate this process, this article divided a mobile commerce system into six components, which can be summarized as follows:

- Mobile commerce applications: Electronic commerce applications are already broad. Mobile commerce applications not only cover the existing applications, but also include new applications, which can be performed at any time and from anywhere by using mobile computing technology.
- Mobile stations: Mobile stations are limited by their small screens, limited memory, limited processing power, and low battery power, and suffer from wireless network transmission problems. Numerous mobile stations, such as PDAs or Web-enabled cellular phones, are available on the market, but most use one of three major operating systems: Palm OS, Microsoft Pocket PC, and Symbian OS. At this moment, Palm OS leads the market, although it faces a serious challenge from Pocket PC.



- **Mobile middleware:** WAP and i-mode are the two major kinds of mobile middleware. WAP is widely adopted and flexible, while i-mode has the highest number of users and is easy to use. It is difficult to predict which middleware will be the eventual winner in the end; it is more likely that the two will be blended somehow at some point in the future.
- **Wireless and wired networks:** Wireless communication capability supports mobility for end users in mobile commerce systems. Wireless LANs and cellular networks are major components used to provide radio communication channels so that mobile service is possible. In the WLAN category, the Wi-Fi standard with 11 Mbps throughput dominates the current market. It is expected that standards with much higher transmission speeds, such as 802.11g, will replace Wi-Fi in the near future. Compared to WLANs, cellular systems can provide longer transmission distances and greater radio coverage, but suffer from the drawback of much lower bandwidth (less than 1 Mbps). In the latest trend for cellular systems, 3G standards supporting wireless multimedia and high-bandwidth services are beginning to be deployed. WCDMA and CDMA2000 are likely to dominate the market in the future.
- **Host computers:** Host computers process and store all the information needed for mobile commerce applications, and most application programs can be found here. They include three major components: Web servers, database servers, and application programs and support software. An important trend for mobile commerce is enhancing mobile security mechanisms and payment methods. Mobile commerce systems can prosper only if information can be securely exchanged among end systems (consumers and vendors). Security issues (including payment) include data reliability, integrity, confidentiality, and authentication and are usually a crucial part of implementation in wireless protocols/systems. Solutions are updated frequently, due to the lack of a comprehensive wireless security infrastructure and standard. A unified approach has not yet emerged.

### KEY TERMS

**i-mode:** the full-color, always-on, and packet-switched Internet service for cellular phone users offered by NTT DoCoMo.

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### Topic 5 mobile apps

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**Subject Online Marketing**

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Using the app, consumers can locate the nearest store to learn more about in-store events and special offers.

The app also features bar code scanning capabilities that let consumers create and manage their wedding registry and shop from the registries of their friends and family as well.

A mobile app such as this is a great way to not only increase sales, but drive in-store traffic as well.

It is important that that retailers have a mobile-optimized presence to better reach on-the-go shoppers.

### **Capital One**

It is important that marketers revamp their mobile applications and Capital One is a great example of a company that did it right.

Capital One updated its mobile banking app to enhance the customer experience by enabling customers to receive special offers from retailers such as Whole Foods and Starbucks.

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The Wedding & Gift registry iPhone app lets consumers create and edit their own registry, as well as scan bar codes in-store to add items.

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Consumers always have their mobile device on them, so by giving them an option to use their mobile device to scan items they want, it proves to be effective.

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The app was a smart move for the company as it invites consumers to take part in its 50 State Challenge initiative that offers one lucky winner a chance to win multiple loyalty-based rewards including free Grand Slams for life.

When consumers check-in they will be able to unlock a digital state souvenir and a variety of badges, as well as special in-store offers and redeemable coupons.

Denny's is encouraging diners to check-in to as many locations as possible and accumulate milestone prizes.

By using a mobile application, Denny's is able to build engagement and drive awareness of its brand.

Additionally, mobile check-ins are a hot commodity right now.

Rewarding consumers is a smart move on the company's part and is a good incentive for them to continually use the mobile app.

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It is important that companies listen to customer needs and constantly look at ways to better their mobile offerings.

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The fast casual restaurant chain's mobile app lets hungry diners order food from their handsets.

In addition to mobile ordering, the app is part of a bigger initiative that is aimed at building P.F. Chang's Warrior Rewards loyalty program. Consumers who download the app and sign up for the Warrior Rewards program can receive a free appetizer.

A mobile ordering app helps cement P.F. Chang's position in the mobile commerce space.

Nowadays, consumers do not want to wait in line to pay for their meals.

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The mobile app is designed to help end world poverty through microcredits.

Using a mobile app to drive awareness is a smart move for the company, especially given the fact that more consumers are bound to participate if it is for a good cause.

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## UNIT-IV

### Topic 1

E-commerce sites use electronic payment, where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing the paperwork, transaction costs, and labor cost. Being user friendly and less time-consuming than manual processing, it helps business organization to expand its market reach/expansion. Listed below are some of the modes of electronic payments –

- Credit Card
- Debit Card
- Smart Card
- E-Money
- Electronic Fund Transfer (EFT)

### Credit Card

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- **The card holder** – Customer
- **The merchant** – seller of product who can accept credit card payments.
- **The card issuer bank** – card holder's bank
- **The acquirer bank** – the merchant's bank
- **The card brand** – for example , visa or Mastercard.

### Credit Card Payment Proces



Step	Description
Step 1	Bank issues and activates a credit card to the customer on his/her request.
Step 2	The customer presents the credit card information to the merchant site or to the merchant from whom he/she wants to purchase a product/service.
Step 3	Merchant validates the customer's identity by asking for approval from the card brand company.
Step 4	Card brand company authenticates the credit card and pays the transaction by credit. Merchant keeps the sales slip.
Step 5	Merchant submits the sales slip to acquirer banks and gets the service charges paid to him/her.
Step 6	Acquirer bank requests the card brand company to clear the credit amount and gets the payment.
Step 6	Now the card brand company asks to clear the amount from the issuer bank and the amount gets transferred to the card brand company.

## Debit Card

Debit card, like credit card, is a small plastic card with a unique number mapped with the bank account number. It is required to have a bank account before getting a debit card from the bank. The major difference between a debit card and a credit card is that in case of payment through debit card, the amount gets deducted from the card's bank account immediately and there should be sufficient balance in the bank account for the transaction to get completed; whereas in case of a credit card transaction, there is no such compulsion.

Debit cards free the customer to carry cash and cheques. Even merchants accept a debit card readily. Having a restriction on the amount that can be withdrawn in a day using a debit card helps the customer to keep a check on his/her spending.

## Smart Card

Smart card is again similar to a credit card or a debit card in appearance, but it has a small microprocessor chip embedded in it. It has the capacity to store a customer's work-related and/or personal information. Smart cards are also used to store money and the amount gets deducted after every transaction.

Smart cards can only be accessed using a PIN that every customer is assigned with. Smart cards are secure, as they store information in encrypted format and are less expensive/provides faster processing. Mondex and Visa Cash cards are examples of smart cards.



## **E-Money**

E-Money transactions refer to situation where payment is done over the network and the amount gets transferred from one financial body to another financial body without any involvement of a middleman. E-money transactions are faster, convenient, and saves a lot of time.

Online payments done via credit cards, debit cards, or smart cards are examples of emoney transactions. Another popular example is e-cash. In case of e-cash, both customer and merchant have to sign up with the bank or company issuing e-cash.

### Electronic Fund Transfer

It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in the same bank or different banks. Fund transfer can be done using ATM (Automated Teller Machine) or using a computer.

Nowadays, internet-based EFT is getting popular. In this case, a customer uses the website provided by the bank, logs in to the bank's website and registers another bank account. He/she then places a request to transfer certain amount to that account. Customer's bank transfers the amount to other account if it is in the same bank, otherwise the transfer request is forwarded to an ACH (Automated Clearing House) to transfer the amount to other account and the amount is deducted from the customer's account. Once the amount is transferred to other account, the customer is notified of the fund transfer by the bank.

### Topic 2

## **Special features required in payment system in E- commerce**

Important or special features for an Internet payment system include security, reliability, scalability, anonymity, acceptability, customer base, flexibility, convertibility, efficiency, ease of integration with applications, and ease of use. Some of these characteristics, like anonymity, are more important in some communities, or for certain kinds of transactions, than they are in other communities. These characteristics are presented for discussion and comparison. The NetCheque and NetCash systems meet some of these characteristics better than other systems, but make trade- offs with respect to some of the other characteristics.

- **Security**

Since payments involve actual money, payment systems will be a prime target for criminals. Since Internet services are provided today on networks that are relatively open, the infrastructure supporting electronic commerce must be usable and resistant to attack in an environment where eavesdropping and modification of messages is easy.

- **Reliability**

As more commerce is conducted over the Internet, the smooth running of the economy will come to depend on the availability of the payment infrastructure, making it a target of attack for vandals. Whether the result of an attack by vandals or simply poor design, an interruption in the availability of the infrastructure would be catastrophic. For this reason, the infrastructure must be highly available and should avoid presenting a single point of failure.



- **Scalability**  
As commercial use of the Internet grows, the demands placed on payment servers will grow too. The payment infrastructure as a whole must be able to handle the addition of users and merchants without suffering a noticeable loss of performance. The existence of central servers through which all transactions must be processed will limit the scale of the system. The payment infrastructure must support multiple servers, distributed across the network.
- **Anonymity**  
For some transactions, the identity of the parties to the transaction should be protected; it should not be possible to monitor an individual's spending patterns, nor determine one's source of income. An individual is traceable in traditional payment systems such as checks and credit cards. Where anonymity is important, the cost of tracking a transaction should outweigh the value of the information that can be obtained by doing so.
- **Acceptability**  
The usefulness of a payment mechanisms is dependent upon what one can buy with it. Thus, a payment instrument must be accepted widely. Where payment mechanisms are supported by multiple servers, users of one server must be able to transact business with users of other servers.
- **Customer base**  
The acceptability of a payment mechanism is affected by the size of the customer base, i.e. the number of users able to make payments using the mechanism. Merchants want to sell products, and without a large enough base of customers using a payment mechanism, it is often not worth the extra effort for a merchant to accept the mechanism.
- **Flexibility**  
Alternative forms of payment are needed, depending on the guarantees needed by the parties to a transaction, the timing of the payment itself, requirements for auditability, performance requirements, and the amount of the payment. The payment infrastructure should support several payment methods including instruments analogous to credit cards, personal checks, cashier's checks, and even anonymous electronic cash. These instruments should be integrated into a common framework.
- **Convertibility**  
Users of the Internet will select financial instruments that best suit their needs for a given transaction. It is likely that several forms of payment will emerge, providing different tradeoffs with respect to the characteristics just described. In such an environment it is important that funds represented by one mechanism be easily convertible into funds represented by others.
- **Efficiency**  
Royalties for access to information may generate frequent payments for small amounts. Applications must be able to make these "micropayments" without noticeable performance degradation. The cost per transaction of using the infrastructure must be small enough that it is insignificant even for transaction amounts on the order of pennies.
- **Ease of integration**



Applications must be modified to use the payment infrastructure in order to make a payment service available to users. Ideally, a common API should be used so that the integration is not specific to one kind of payment instrument. Support for payment should be integrated into request-response protocols on which applications are built so that a basic level of service is available to higher level applications without significant modification.

- Ease of use

Users should not be constantly interrupted to provide payment information and most payments should occur automatically. However, users should be able to limit their losses. Payments beyond a certain threshold should require approval. Users should be able to monitor their spending without going out of their way to do so.

### Topic 3

#### Types of e payment system

When you purchase goods and services online, you pay for them using an electronic medium. This mode of payment, without using cash or cheque, is called an e-commerce payment system and is also known as online or electronic payment systems.

The growing use of internet-based banking and shopping has seen the growth of various e-commerce payment systems and technology has been developed to increase, improve and provide secure e-payment transactions.

Paperless e-commerce payments have revolutionised the payment processing by reducing paper work, transaction costs, and personnel cost. The systems are user-friendly and consume less time than manual processing and help businesses extend their market reach.

The different types of e-commerce payments in use today are:

**Credit Card** The most popular form of payment for e-commerce transactions is through credit cards. It is simple to use; the customer has to just enter their credit card number and date of expiry in the appropriate area on the seller's web page. To improve the security system, increased security measures, such as the use of a card verification number (CVN), have been introduced to on-line credit card payments. The CVN system helps detect fraud by comparing the CVN number with the cardholder's



information.

**Debit Card** Debit cards are the second largest e-commerce payment medium in India. Customers who want to spend online within their financial limits prefer to pay with their Debit cards. With the debit card, the customer can only pay for purchased goods with the money that is already there in his/her bank account as opposed to the credit card where the amounts that the buyer spends are billed to him/her and payments are made at the end of the billing period.

**Smart Card** It is a plastic card embedded with a microprocessor that has the customer's personal information stored in it and can be loaded with funds to make online transactions and instant payment of bills. The money that is loaded in the smart card reduces as per the usage by the customer and has to be reloaded from his/her bank account.

**E-Wallet** E-Wallet is a prepaid account that allows the customer to store multiple credit cards, debit card and bank account numbers in a secure environment. This eliminates the need to key in account information every time while making payments. Once the customer has registered and created E-Wallet profile, he/she can make payments faster.

**Netbanking** This is another popular way of making e-commerce payments. It is a simple way of paying for online purchases directly from the customer's bank. It uses a similar method to the debit card of paying money that is already there in the customer's bank. Net banking does not require the user to have a card for payment purposes but the user needs to register with his/her bank for the net banking facility. While completing the purchase the customer just needs to put in their net banking id and pin.

**Mobile Payment** One of the latest ways of making online payments are through mobile phones. Instead of using a credit card or cash, all the customer has to do is send a payment request to his/her service provider via text message; the customer's mobile account or credit card is charged for the purchase. To set up the mobile payment system, the customer just has to download a software from his/her service provider's website and then link the credit card or mobile billing information to the software.

### E-Cash

eCash was a digital-based system that facilitated the transfer of funds anonymously. A pioneer in [cryptocurrency](#), its goal was to secure the privacy of individuals that use the Internet for [micropayments](#). eCash was created by Dr. David Chaum under his company, DigiCash, in 1990. Though there was interest in the platform from large banks, eCash never took off and DigiCash filed for bankruptcy in 1998. DigiCash, along with its eCash patents, was eventually sold off. In 2018, Chaum launched a new startup focused on cryptography.



### **E-Cheque**

An eCheque is a payment that you make directly from your bank account. You can only send an eCheque if your bank account is the only payment method attached to your bank account, and you don't have a credit or debit card as a back-up payment method. If you have a back-up payment method, you won't be able to send eCheques.

Please note that eCheques are not instant payments. It usually takes up to 6 working days for an eCheque to complete and the money to appear in the recipient's PayPal account.

If you would like a faster way to pay using your bank account, we recommend using Instant Bank Transfer.

To send instant bank transfers, you need to have a verified bank account and a credit or debit card attached as a back-up payment method.

## **UNIT-V**

### Topic 1

#### **Security Aspects in E commerce**

Security is an essential part of any transaction that takes place over the internet. Customers will lose his/her faith in e-business if its security is compromised. Following are the essential requirements for safe e-payments/transactions –

- **Confidentiality** – Information should not be accessible to an unauthorized person. It should not be intercepted during the transmission.
- **Integrity** – Information should not be altered during its transmission over the network.
- **Availability** – Information should be available wherever and whenever required within a time limit specified.
- **Authenticity** – There should be a mechanism to authenticate a user before giving him/her an access to the required information.



- **Non-Repudiability** – It is the protection against the denial of order or denial of payment. Once a sender sends a message, the sender should not be able to deny sending the message. Similarly, the recipient of message should not be able to deny the receipt.
- **Encryption** – Information should be encrypted and decrypted only by an authorized user.
- **Auditability** – Data should be recorded in such a way that it can be audited for integrity requirements.

### Measures to ensure Security

Major security measures are following –

- **Encryption** – It is a very effective and practical way to safeguard the data being transmitted over the network. Sender of the information encrypts the data using a secret code and only the specified receiver can decrypt the data using the same or a different secret code.
- **Digital Signature** – Digital signature ensures the authenticity of the information. A digital signature is an e-signature authenticated through encryption and password.
- **Security Certificates** – Security certificate is a unique digital id used to verify the identity of an individual website or user.

### Security Protocols in Internet

We will discuss here some of the popular protocols used over the internet to ensure secured online transactions.

#### Secure Socket Layer (SSL)

It is the most commonly used protocol and is widely used across the industry. It meets following security requirements –

- Authentication
- Encryption
- Integrity
- Non-reputability

"https://" is to be used for HTTP urls with SSL, where as "http://" is to be used for HTTP urls without SSL.

#### Secure Hypertext Transfer Protocol (SHTTP)

SHTTP extends the HTTP internet protocol with public key encryption, authentication, and digital signature over the internet. Secure HTTP supports multiple security mechanism, providing security to the end-users. SHTTP works by negotiating encryption scheme types used between the client and the server.

#### Secure Electronic Transaction

It is a secure protocol developed by MasterCard and Visa in collaboration. Theoretically, it is the best security protocol. It has the following components –

- **Card Holder's Digital Wallet Software** – Digital Wallet allows the card holder to make secure purchases online via point and click interface.



- **Merchant Software** – This software helps merchants to communicate with potential customers and financial institutions in a secure manner.
- **Payment Gateway Server Software** – Payment gateway provides automatic and standard payment process. It supports the process for merchant's certificate request.
- **Certificate Authority Software** – This software is used by financial institutions to issue digital certificates to card holders and merchants, and to enable them to register their account agreements for secure electronic commerce.

### Topic 2

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#### Threat to E-Commerce

E-Commerce refers to the activity of buying and selling things over the internet. Simply, it refers to the commercial transactions which are conducted online. E-commerce can be drawn on many technologies such as mobile commerce, Internet marketing, online transaction processing, electronic funds transfer, supply chain management, electronic data interchange (EDI), inventory management systems, and automated data collection systems.

E-commerce threat is occurring by using the internet for unfair means with the intention of stealing, fraud and security breach. There are various types of e-commerce threats. Some are accidental, some are purposeful, and some of them are due to human error. The most common security threats are an electronic payments system, e-cash, data misuse, credit/debit card frauds, etc.

#### Electronic payments system:

With the rapid development of the computer, mobile, and network technology, e-commerce has become a routine part of human life. In e-commerce, the customer can order products at home and save time for doing other things. There is no need of visiting a store or a shop. The customer can select different stores on the Internet in a very short time and compare the products with different characteristics such as price, colour, and quality.

The electronic payment systems have a very important role in e-commerce. E-commerce organizations use electronic payment systems that refer to paperless monetary transactions. It revolutionized the business processing by reducing paperwork, transaction costs, and labour cost. E-commerce processing is user-friendly and less time consuming than manual processing. Electronic commerce helps a business organization expand its market reach expansion. There is a certain risk with the electronic payments system.

#### Some of them are:

##### The Risk of Fraud

An electronic payment system has a huge risk of fraud. The computing devices use an identity of the person for authorizing a payment such as passwords and security questions. These authentications are not full proof in determining the identity of a person. If the password and the answers to the security questions are matched, the system doesn't care who is on the other side. If someone has access to our password or the answers to our security question, he will gain access to our money and can steal it from us.



### **The Risk of Tax Evasion**

The Internal Revenue Service law requires that every business declare their financial transactions and provide paper records so that tax compliance can be verified. The problem with electronic systems is that they don't provide cleanly into this paradigm. It makes the process of tax collection very frustrating for the Internal Revenue Service. It is at the business's choice to disclose payments received or made via electronic payment systems. The IRS has no way to know that it is telling the truth or not that makes it easy to evade taxation.

### **The Risk of Payment Conflicts**

In electronic payment systems, the payments are handled by an automated electronic system, not by humans. The system is prone to errors when it handles large amounts of payments on a frequent basis with more than one recipients involved. It is essential to continually check our pay slip after every pay period ends in order to ensure everything makes sense. If it is a failure to do this, may result in conflicts of payment caused by technical glitches and anomalies.

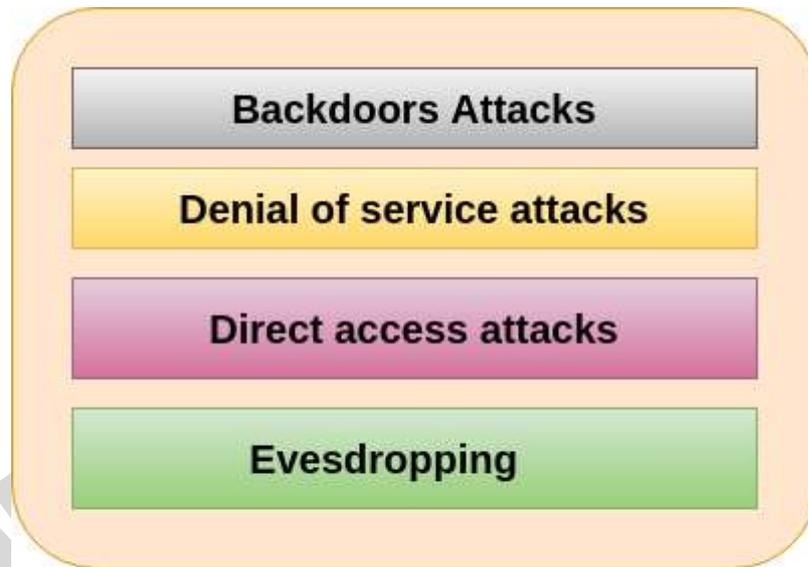
### **E-cash**

E-cash is a paperless cash system which facilitates the transfer of funds anonymously. E-cash is free to the user while the sellers have paid a fee for this. The e-cash fund can be either stored on a card itself or in an account which is associated with the card. The most common examples of e-cash system are transit card, PayPal, GooglePay, Paytm, etc.

### **E-cash has four major components-**

1. **Issuers** - They can be banks or a non-bank institution.
2. **Customers** - They are the users who spend the e-cash.
3. **Merchants or Traders** - They are the vendors who receive e-cash.
4. **Regulators** - They are related to authorities or state tax agencies.

In e-cash, we stored financial information on the computer, electronic device or on the internet which is vulnerable to the hackers. Some of the major threats related to e-cash system are-



## E-cash Threats

### Backdoors Attacks

It is a type of attacks which gives an attacker to unauthorized access to a system by bypasses the normal authentication mechanisms. It works in the background and hides itself from the user that makes it difficult to detect and remove.

### Denial of service attacks

A denial-of-service attack (DoS attack) is a security attack in which the attacker takes action that prevents the legitimate (correct) users from accessing the electronic devices. It makes a network resource unavailable to its intended users by temporarily disrupting services of a host connected to the Internet.

### Direct Access Attacks

Direct access attack is an attack in which an intruder gains physical access to the computer to perform an unauthorized activity and installing various types of software to compromise security. These types of software loaded with worms and download a huge amount of sensitive data from the target victims.

### Eavesdropping

This is an unauthorized way of listening to private communication over the network. It does not interfere with the normal operations of the targeting system so that the sender and the recipient of the messages are not aware that their conversation is tracking.

### Credit/Debit card fraud

A credit card allows us to borrow money from a recipient bank to make purchases. The issuer of the credit card has the condition that the cardholder will pay back the borrowed money with an additional agreed-upon charge.



A debit card is of a plastic card which issued by the financial organization to account holder who has a savings deposit account that can be used instead of cash to make purchases. The debit card can be used only when the fund is available in the account.

Some of the important threats associated with the debit/credit card are-

### **ATM (Automated Teller Machine)-**

It is the favourite place of the fraudster from there they can steal our card details. Some of the important techniques which the criminals opt for getting hold of our card information is:

#### **Skimming-**

It is the process of attaching a data-skimming device in the card reader of the ATM. When the customer swipes their card in the ATM card reader, the information is copied from the magnetic strip to the device. By doing this, the criminals get to know the details of the Card number, name, CVV number, expiry date of the card and other details.

#### **Unwanted Presence-**

It is a rule that not more than one user should use the ATM at a time. If we find more than one people lurking around together, the intention behind this is to overlook our card details while we were making our transaction.

#### **Vishing/Phishing**

Phishing is an activity in which an intruder obtained the sensitive information of a user such as password, usernames, and credit card details, often for malicious reasons, etc.

Vishing is an activity in which an intruder obtained the sensitive information of a user via sending SMS on mobiles. These SMS and Call appears to be from a reliable source, but in real they are fake. The main objective of vishing and phishing is to get the customer's PIN, account details, and passwords.

#### **Online Transaction**

Online transaction can be made by the customer to do shopping and pay their bills over the internet. It is as easy as for the customer, also easy for the customer to hack into our system and steal our sensitive information. Some important ways to steal our confidential information during an online transaction are-

- By downloading software which scans our keystroke and steals our password and card details.
- By redirecting a customer to a fake website which looks like original and steals our sensitive information.
- By using public Wi-Fi

#### **POS Theft**

It is commonly done at merchant stores at the time of POS transaction. In this, the salesperson takes the customer card for processing payment and illegally copies the card details for later use.



Topic 3 Types of threats

**e-commerce threat**

In simple words, you can say that using the internet for unfair means with an intention of stealing, fraud and security breach.

There are various types of e-commerce threats. Some are accidental, some are purposeful, and some of them are due to human error. The most common security threats are phishing attacks, money thefts, data misuse, hacking, credit card frauds, and unprotected services.

**Inaccurate management**-One of the main reason for e-commerce threats is poor management. When security is not up to the mark, it poses a very dangerous threat to the networks and systems. Also, security threats occur when there are no proper budgets are allocated for the purchase of anti-virus software licenses.

**Price Manipulation**-Modern e-commerce systems often face price manipulation problems. These systems are fully automated; right from the first visit to the final payment getaway. Stealing is the most common intention of price manipulation. It allows an intruder to slide or install a lower price into the URL and get away with all the data.

**Snowshoe Spam**-Now spam is something which is very common. Almost each one of us deals with spam emails in our mailbox. The spam messages problem has never been actually solved, but now it is turning out to be a not so general issue. The reason for this is the very nature of a spam message. Spam is something which is sent by one person, but unfortunately, new development is taking place in the cyber world. It is called as snowshoe spam. Unlike regular spam it is not sent from one computer but is sent from many users. In such a case it becomes difficult for the anti-spam software to protect the spam messages.

**Malicious code threats**-These code threats typically involve viruses, worms, Trojan horses.

- Viruses are normally external threats and can corrupt the files on the website if they find their way in the internal network. They can be very dangerous as they destroy the computer systems completely and can damage the normal working of the computer. A virus always needs a host as they cannot spread by themselves.
- Worms are very much different and are more serious than viruses. It places itself directly through the internet. It can infect millions of computers in a matter of just a few hours.
- A Trojan horse is a programming code which can perform destructive functions. They normally attack your computer when you download something. So always check the source of the downloaded file.

**Hactivism**-The full form of Hactivism is hacking activism. At first, it may seem like you should hardly be aware of this cyber threat. After all, it is a problem not directly related to you. Why should you be bothered at all? However, that's not the case. Firstly hacktivists do not target directly to those associated only with politics. It can also be a socially motivated purpose. It is typically using social media platforms to bring to light social issues. It can also include flooding an email address with so much traffic that it temporarily shuts down.



**Wi-Fi Eavesdropping**-It is also one of the easiest ways in e-commerce to steal personal data. It is like a “virtual listening” of information which is shared over a Wi-Fi network which is not encrypted. It can happen on the public as well as on personal computers.

**Other threats**-Some other threats which include are data packet sniffing, IP spoofing, and port scanning. Data packet sniffing is also normally called as sniffers. An intruder can use a sniffer to attack a data packet flow and scan individual data packs. With IP spoofing it is very difficult to track the attacker. The purpose here is to change the source address and give it such a look that it should look as though it originated from another computer.

Next topic

Risk management approaches- These are the following risk management approaches in e commerce

1. **Educate and train your staff on e-commerce risk.** The extent of your risk exposure largely depends on your business policies, operational practices, the fraud detection and prevention tools you have implemented, security controls, and the types of products and services that you provide. Everyone in your organization should understand the risks associated with online transactions and be able to follow your established risk management procedures.
2. **Find the right payment processor.** The right credit card processing company will provide effective risk management support and help you understand the specific e-commerce fraud risk and liability. Adequate customer data protection capabilities are also something you will want to consider when making your selection.
3. **Create essential website content.** Your website must include and prominently display your privacy, shipping, return and refund policies. It must be reliable and to provide customers with easy and simple navigation. Placing links to these policies in the footer of your website will make them present on every page.
4. **Focus on risk reduction.** A well designed sales order process will help you address a number of risk concerns. You should indicate or highlight required transaction fields in your online payment acceptance form and verify card and cardholder information that you receive from your customers over the internet.
5. **Develop internal fraud prevention structure.** The profitability of your e-commerce organization depends on your internal strategies and controls for minimizing fraud. A risk management structure, combined with adequate transaction controls, will help you avoid fraud-related losses.
6. **Use fraud prevention tools.** There are a number of fraud prevention tools to help reduce your risk exposure. The most widely used among them are the Address Verification Service (AVS), the Card Security Codes (CVV2, CVC 2 and CID), Verified by Visa and MasterCard SecureCode.
7. **Build a fraud screening process.** When adequately implemented, the screening of online card transactions can help you minimize fraud for large-ticket items and for high-risk transactions.
8. **Protect your merchant account from intrusion.** Implementing proactive measures can minimize the risk of criminals gaining access to your shopping cart or payment gateway and making fraudulent fund deposits.
9. **Participate in Verified by Visa and MasterCard SecureCode.** The two fraud prevention tools enhance security by requiring cardholders to authenticate themselves by entering a password during the checkout. The password is verified by the card issuer and, if correct, the transaction is allowed to be completed. Implementing Verified by Visa and MasterCard SecureCode protects merchants from fraud-related chargebacks.



10. **Secure the process of routing your authorizations.** You must ensure that your authorization requests are submitted in a secure and efficient manner, before you can start accepting card payments over the internet.
11. **Establish a process for handling transaction post-authorizations.** You need to set up an effective process for dealing with approved and declined authorizations before fulfilling an order.
12. **Ensure PCI compliance.** The Payment Card Industry (PCI) Data Security Standards (DSS) provide web-based merchants with standards, procedures and tools for protecting sensitive account information. You will need reliable encryption capabilities for data transmission and effective internal controls for protecting stored card and cardholder information. You will also need to review your security measures on a regular basis.
13. **Minimize unnecessary chargebacks.** Chargebacks result in extra processing time and costs, while hurting your profits and may result in a loss of revenue. By carefully tracking and managing chargebacks, you will be able to set up concrete procedures for avoiding future chargebacks. You will also need to know your re-presentment rights.
14. **Monitor chargebacks.** Effective chargeback monitoring mechanisms will help you detect excessive chargeback activity, identify the causes, and apply corrective measures to bring chargeback levels down. You can develop your own monitoring process or implement a third-party solution.
15. **Use collection efforts to minimize losses.** You can utilize a third-party collection service or build your own to help recover unwarranted chargeback losses.

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