



# E-COMMERCE CONCEPTS

## 1.1 E-COMMERCE – ANYTIME COMMERCE

**E-Commerce** stands for 'Electronic Commerce'. It refers to buying and selling of goods, products, or services over the internet.

E-commerce as anytime commerce is the ability to buy and sell goods and services online at any time of day or night, from anywhere in the world. This is made possible by the fact that e-commerce websites are hosted on the internet, which is accessible 24/7.

E-commerce is a powerful tool that can be used to improve the customer experience and increase sales. It allows customers to shop whenever they want, regardless of their time zone or work schedule. This can be especially convenient for people who work long hours or who have busy lifestyles.

Here are some examples of anytime commerce:

- You can shop on *Amazon* at any time of day or night, from anywhere in the world.
- You can order a pizza from *Domino's* online and have it delivered to your door in minutes.
- You can book a flight on *Kayak* at any time of day, even if it's in the middle of the night.

The term '*e-Commerce*' also comprises other activities including- online auctions, internet banking, payment gateways, and online ticketing.

Some popular e-Commerce platforms are: *Amazon, Flipkart, Myntra, IndiaMART, and Snapdeal.*

**Note:** E-Commerce is also known as '**Internet Commerce**'.

### 1.1.1 FEATURES OF E-COMMERCE

Some of the features of E-Commerce are as follows:

- **Cashless Payment:** E-Commerce allows the use of electronic payment. It allows the transaction from credit cards, debit cards, electronic fund transfer via bank's website, and other electronic payment methods.
- **24x7 Availability:** E-Commerce provides 24x7 service availability. It is available anywhere, anytime.
- **Improved Sales:** Using e-commerce, orders for the products can be generated anytime, anywhere without any human intervention. It gives a big boost to existing sales volumes.
- **Advertising and Marketing:** E-Commerce helps in good marketing management of products and services. It helps to increase the reach of advertising of products and services of businesses.
- **Support:** E-commerce provides various ways to provide pre-sales and post-sales assistance to provide better services to customers.
- **Improvement in Communication:** E-commerce gives faster, efficient and reliable communication with customers and partners.
- **Global Reach:** It enables a business to easily reach across geographic boundaries.

### 1.1.2 ADVANTAGES OF E-COMMERCE

E-commerce is beneficial for organizations, society, and customers. So, e-Commerce advantages can be broadly classified in three major categories:

- (i) Advantages to Organizations
- (ii) Advantages to Customers
- (iii) Advantages to Society

#### 1.1.2.1 ADVANTAGES OF E-COMMERCE TO ORGANIZATIONS

There are various benefits of e-Commerce to organizations that are listed as follows:

- Using e-commerce, organizations can expand their market to national and

international levels with minimum investment. An organization can easily locate more customers, best suppliers, and suitable business partners across the globe.

- E-commerce improves the brand image of the company.
- Using e-commerce, paperwork is reduced.
- E-commerce helps organization to provide better customer services.
- E-commerce helps to increase the productivity of organizations.
- E-commerce helps to simplify the business processes and makes them faster and efficient.
- E-commerce provides organizations with the ability to quickly share information with business partners and customers.

#### **1.1.2.2 ADVANTAGES OF E-COMMERCE TO CUSTOMERS**

There are various benefits of e-Commerce to customers that are listed as follows:

- E-commerce provides 24x7 supports to customers. Customers can enquire about a product or service and place orders anytime, anywhere from any location.
- E-commerce application provides users with more options to compare and select the cheaper and better options.
- E-commerce application provides a faster delivery of products to its customers.
- A customer can put review comments about a product and can see what others are buying, or see the review comments of other customers before making a final purchase.
- It provides the information in an easy way, i.e., the information is not hard to read. A customer can see the detailed information of a product within some seconds instead of waiting for days.
- E-Commerce increases the competition among organizations and as a result, organizations provide big discounts to customers.
- There are many ways of making payments at e-Commerce sites through various payment modes like- internet banking, credit card, debit card, cheques and even cash on delivery. Hence, customer has option to choose the payment method of his choice based on his convenience.

#### **1.1.2.3 ADVANTAGES OF E-COMMERCE TO SOCIETY**

There are various benefits of e-Commerce to society that are listed as follows:

- Customers need not travel to shop a product, thus less traffic on road and low air pollution.

- E-commerce has enabled rural areas to access services and products, which are otherwise not available to them.
- E-commerce helps in reducing the cost of products, so less rich people can also afford the products.
- E-commerce helps the government to deliver public services such as healthcare, education, social services at a reduced cost and in an improved manner.

### 1.1.3 DISADVANTAGES OF E-COMMERCE

The limitations of using e-Commerce are mentioned as follows:

- E-commerce has no universal standard for quality and reliability.
- As there is a requirement of the internet to use e-commerce, it is possible that the internet may be slow.
- Strong security is required in e-commerce as all transactions are through internet.
- Lack of touch or feel of products during online shopping is a drawback.
- Sometimes, there is a risk of purchasing unsatisfactory products via E-commerce.
- Customers also trap in banking fraud which is quite frequent.
- Hackers also try to get access of data or to destroy data in e-commerce.
- It is inconvenient to use the internet for those people who are living in remote villages, and it is still not cheaper.
- The cost of the creation and building of an e-commerce application may be very high.

#### (TRADITIONAL COMMERCE V/S. E-COMMERCE)

Traditional Commerce	E-Commerce
Traditional commerce refers to the commercial transactions or exchange of information, buying or selling product/services from person to person without use of internet.	E-commerce refers to the commercial transactions or exchange of information, buying or selling product/services electronically with the help of internet.
The start-up cost of traditional commerce is very high.	The start-up cost of e-commerce is low.
Traditional commerce is usually carried out by face to face.	E-commerce is carried out by screen to face.
In traditional commerce, processing of transaction is manual.	In e-commerce, processing of transaction is automatic.

In traditional commerce, delivery of products is instant.	In e-commerce, delivery of products takes time.
Its accessibility is for limited time in a day.	Its accessibility is 24x7. 24x7 means "24 hours a day, 7 days a week".
Traditional commerce is done where digital network is not reachable.	E-commerce is used to save valuable time and money.
Traditional commerce is an older method of business style which comes under traditional business.	E-commerce is a newer concept of business style which comes under e-business.
In traditional commerce, customers can inspect products physically before purchase.	In e-commerce, customers can not inspect products physically before purchase.
Communications of business depends upon individual skills.	In e-Commerce, there is no human intervention.

## 1.2 DIMENSIONS OF E-COMMERCE

The dimensions of e-commerce refer to the different aspects of e-commerce that businesses need to consider in order to be successful. These dimensions include:

- **Products and services:** The products and services that are available for purchase online. This includes everything from physical goods to digital content.
- **Customers:** The people who buy products and services online. This includes both individuals and businesses.
- **Businesses:** The companies that sell products and services online. This includes both large retailers and small businesses.
- **Technology:** The technology used to create and maintain an e-commerce website or platform. This includes the hardware, software, and telecommunications infrastructure.
- **Content:** The content that is used to attract and engage customers. This includes product descriptions, images, videos, and blog posts.
- **Marketing:** The strategies used to promote an e-commerce website or platform. This includes search engine optimization (SEO), pay-per-click (PPC) advertising, and social media marketing.
- **Shipping:** The methods used to deliver products to customers. This includes shipping carriers, shipping rates, and shipping tracking.

- **Payment processing:** The methods used to process payments from customers. This includes credit cards, debit cards, PayPal, and other payment methods.
- **Customer service:** The support provided to customers before, during, and after a purchase. This includes live chat, email support, and phone support.
- **Security:** The measures taken to protect customer data and prevent fraud. This includes encryption, firewalls, and fraud detection software.

Each of these dimensions is important in its own way, and businesses need to consider all of them in order to create a successful e-commerce website or platform.

Here are some of the key trends that are shaping the dimensions of e-commerce:

- **The growth of mobile commerce:** More and more people are shopping online using their mobile devices. This is driving the growth of mobile commerce, which is the buying and selling of goods and services through mobile devices.
- **The rise of social commerce:** Social media is becoming an increasingly important platform for e-commerce. Businesses are using social media to promote their products and services, connect with customers, and drive sales.
- **The increasing importance of data analytics:** Businesses are using data analytics to better understand their customers and their needs. This data can be used to improve the customer experience, target marketing campaigns, and make better business decisions.
- **The growth of cross-border commerce:** More and more people are shopping online from other countries. This is driving the growth of cross-border commerce, which is the buying and selling of goods and services across borders.

### 1.3 E-COMMERCE BUSINESS MODELS / TYPES OF E-COMMERCE

Nowadays e-commerce has become very popular among the people who want to buy and sell different things online.

There are basically four main types of e-commerce models that can describe almost every transaction between **Consumers (C)** and **Businesses (B)**.

- (1) Business to Consumer (B2C)
- (2) Business to Business (B2B)

(3) Consumer to Consumer (C2C)

(4) Consumer to Business (C2B)

### (1) Business to Consumer (B2C)

In **Business-to-Consumer (B2C)** e-commerce, the company will sell their goods and/or services directly to the consumer.

In this type of e-commerce, customers or consumers visit the company's website and look at products, pictures and read reviews there. Then they place their order and the company ships the goods directly to them.

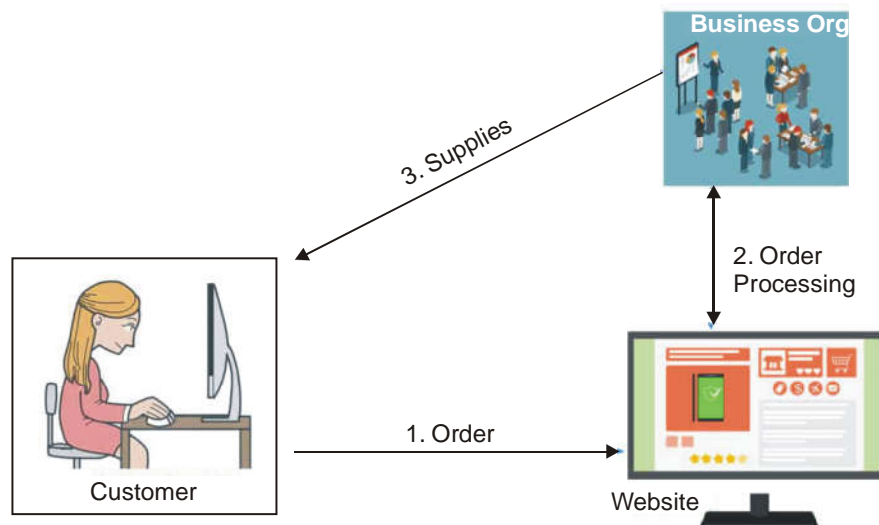


Fig. 1.1 (B2C E-Commerce Model)

**Example:** An example of B2C e-commerce would be someone buying a pair of shoes online from **Amazon** or **eBay**.

### (2) Business to Business (B2B)

In **Business-to-Business (B2B)** e-commerce, the companies are doing business with each other. B2B takes place between two businesses where one business provides services to other business.

In this type of e-commerce, the final consumer is not involved. The online transactions only involve the manufacturers, wholesalers, retailers etc.

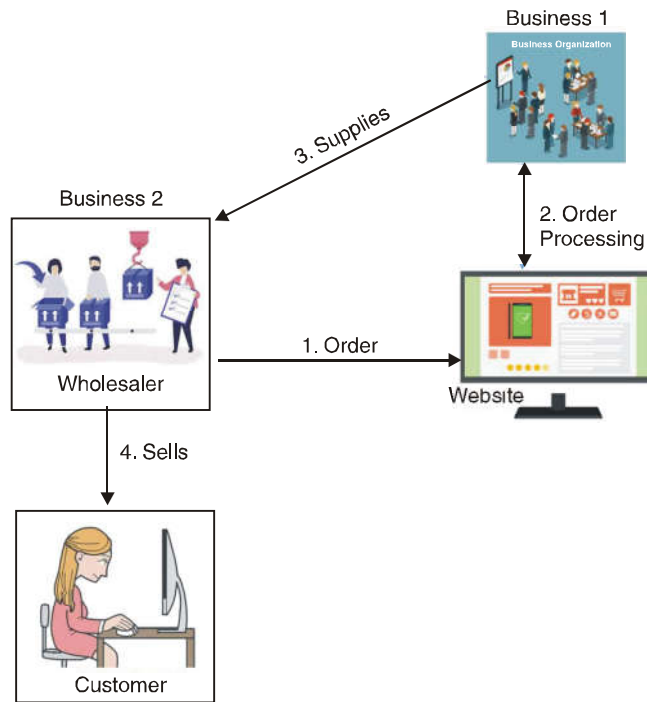


Fig. 1.2 (B2B E-Commerce Model)

**Example:** A wholesaler places an order from a company's website (manufacturer) and after receiving the consignment, sells the end product to the final customer who comes to buy the product at one of its retail outlets.

**(3) Consumer to Consumer (C2C)**

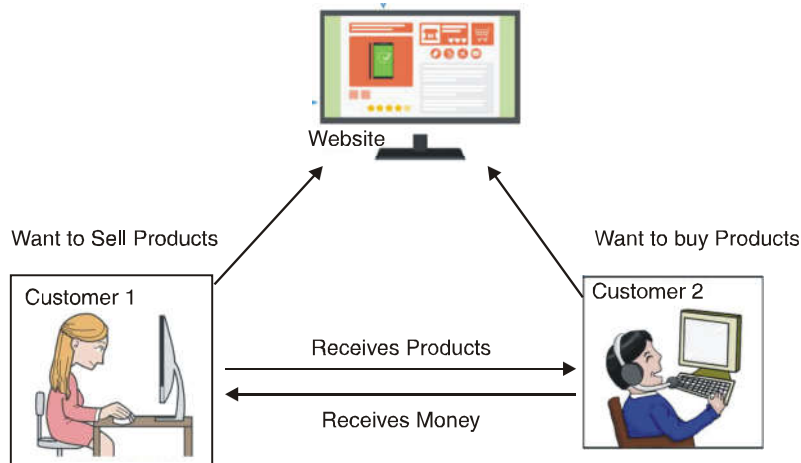


Fig. 1.3 (C2C E-Commerce Model)



In **Consumer -to- Consumer (C2C)** e-commerce, the consumers are in direct contact with each other. No company is involved. It helps people sell their personal goods and assets directly to an interested party. C2C e-commerce takes place between two consumers where one consumer sells an item through an online auction while the other consumer purchases the item by offering the highest bid.

**Example:** CUSTOMER 1 wants to sell a car, so he/she can place his/her car on a website like- OLX or eBay, while the CUSTOMER 2 wants to buy that car. So, the CUSTOMER 2 can contact CUSTOMER 1 and buys the car from him/her.

#### (4) Consumer to Business (C2B)

This is the reverse of B2C; it is a **Consumer to Business**.

In **Consumer -to- Business (C2B)** e-commerce, the consumer provides a good or some service to the company. In this business model, the consumer creates value, and the business consumes that value.

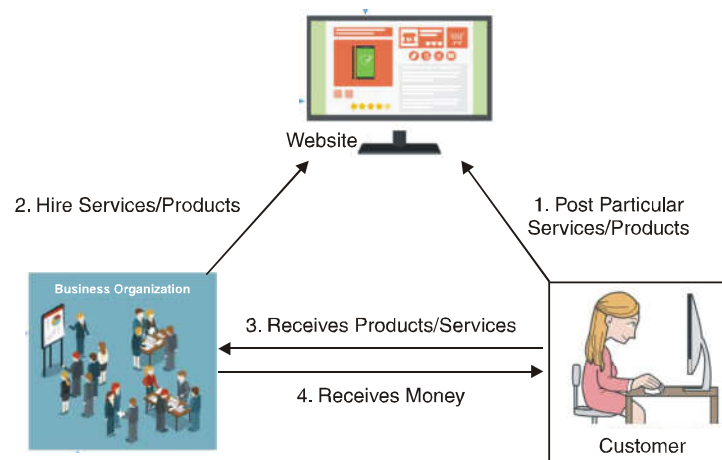


Fig. 1.4 (C2B E-Commerce Model)

**Example:** A customer places some of their services or products on the website. If the services or products create value for the business organization, then they order these services or products, but in most cases, services. When the deal is done, they receive services or products, and the customer receives money.

**Note:** Freelancing websites like- **Fiverr, Freelancer** work on C2B business model.

## 1.4 M-COMMERCE – CONCEPT

M-commerce, also known as *mobile commerce*, is defined as the process of conducting business transactions using portable mobile devices connected over wireless networks. The

business transactions can range from buying and selling goods to mobile payments, downloading audio/video content, playing online games, using numerous software applications and purchasing mobile tickets. Mobile devices include cell phones, handheld computers such as palmtops or tablets, smartphones and personal digital assistants (PDA). The mobile users can use these devices to access the internet without a cable connection or a computer.

**“Mobile commerce** means doing commercial transactions such as online banking, paying bills or making purchases using wireless devices like- *mobile phones or tablets* online.”

You can't use your laptop or PC (Personal Computer) everywhere, but you can use your mobile phones easily. You can do online shopping while travelling, transfer money easily with the help of mobile phones. Thus, this wireless solution is very much helpful and rising day by day.

Powered by emerging technology based on *Wireless Application Protocol (WAP)*, m-commerce uses web-enabled micro-browsers in these mobile devices to surf the internet anytime, anywhere in the world. WAP-enabled smartphones with Bluetooth technology provide the user with FAX, e-mail and telephone functions to facilitate business transactions in transit. Such smartphones are becoming so popular that most business houses have adopted m-commerce as the more efficient method of reaching to the customers or communicating with other business partners. Delivering content via wireless mobile devices has become much faster, safer, and cheaper. The reservation of flight/train/bus tickets via mobile devices saves time and offers security for numerous passengers.

Such services are gradually making m-commerce as the method of choice for performing digital business transactions. For these reasons, m-commerce is sometimes referred to as *next generation e-commerce*.

M-commerce is actually just a subset of e-commerce. It is a fast growing sector of e-commerce. The only difference is that users don't require a laptop or PC for this purpose. They can use portable devices like- smartphones and tablets. This way, users can access online shopping sites as well as other online services anywhere and anytime.

M-commerce can be categorized by function as- *mobile shopping, mobile banking or mobile payment*.

**Mobile shopping** allows a customer to purchase a product online from a mobile device using an application such as *Amazon or Flipkart*.

*Mobile banking* is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device such as a smartphone or tablet. Unlike the related internet banking it uses software, usually called an *app*, provided by the financial institution for the purpose. Mobile banking is dependent on the availability of an internet or data connection to the mobile device.

*Mobile payment* is a money payment made for a product or service through a mobile phone. Mobile payment technology can also be used to instantly send money to friends or family members. Digital wallets like- *Paytm, Google Pay*, etc. allow a customer to make payments without swiping a card or paying with physical cash.

Mobile commerce is based on *wireless communication technology*. Wireless communication technology has emerged as the new choice of the modern corporate world. The wireless network has some distinct advantages over traditional wired networks, which use coaxial, twisted pair, or fibre optic cables to physically connect two or more computing devices. In wireless networks, data transmission between computers is facilitated by microwaves, radio waves, or infrared waves. It eliminates the cumbersome cabling process with bulky cables and significantly reduces labour and material costs as well as development time. The wireless network technology, together with the wireless application protocol, forms the backbone of mobile commerce applications. In various vertical markets such as retail, healthcare, manufacturing and warehousing, mobile commerce gained acceptance and increased productivity through the use of mobile devices. The mobile handheld devices are used to transmit data to centralized hosts in real time over wireless networks.

Mobile commerce, which uses wireless technology, offers some additional advantages over internet-based e-commerce. In *e-commerce*, the internet provides information at any time of the day; in *m-commerce*; the information is available anytime, anywhere. In e-commerce, the information is available as long as the user is connected to the internet, i.e. connected to the wired network. If the user is involved in some other activities, i.e. travelling or doing some offline job, which forces him/her to become disconnected from the internet, the information becomes unavailable. M-commerce removes such uncertainties. Wireless networking enables the user to be connected to the wireless internet even when on the move. This means that in m-commerce it is possible to stay online anywhere in the world and at any time of the day. The user can instantly access information with the help of the mobile device and the wireless network or the Internet, even when he/she is doing other activities such as traveling or shopping. This helps employees to make spontaneous decisions, customers to ask questions spontaneously, and business owners to conduct transactions at any time regardless of their geographic location.

M-commerce is recommended for every business irrespective of its type, scale, and size. The probability of your potential customers owning a smartphone is very high, so you can safely assume that you will get much more positive response from mobile devices than your website.

### 1.4.1 M-COMMERCE: AN INFORMATION SYSTEMS PERSPECTIVE

M-commerce from an information systems perspective refers to the integration of mobile technologies and systems into e-commerce processes, enabling users to conduct business transactions using mobile devices. It involves the use of wireless networks and mobile applications to facilitate buying, selling, and exchanging of goods and services.

Here are some key concepts related to m-commerce from an information systems perspective:

- **Mobile Devices and Platforms:** M-commerce heavily relies on mobile devices like smartphones, tablets, and wearables. These devices come with various operating systems (iOS, Android, etc.) and require compatible mobile applications to engage in mobile transactions.
- **Mobile Applications (Apps):** Mobile commerce applications, commonly known as m-commerce apps, are designed to run on mobile devices. These apps enable users to access online stores, conduct secure payments, track orders, and receive personalized offers.
- **Mobile Payment Systems:** M-commerce payment systems allow users to make payments for goods and services using their mobile devices. These systems include mobile wallets, NFC-based payment methods, and mobile banking apps.
- **Mobile Shopping and User Experience:** The focus of m-commerce is to provide users with a seamless and convenient shopping experience on mobile devices. User experience (UX) is a critical aspect, ensuring that the mobile interface is user-friendly, responsive, and tailored to the specific needs of mobile users.
- **Mobile Marketing and Personalization:** M-commerce leverages mobile marketing strategies to reach a wider audience. Location-based services and user data analysis enable personalized marketing messages, promotions, and recommendations for individual users.
- **Mobile Security:** Ensuring the security and privacy of mobile transactions is very important in m-commerce. Information systems incorporate various security measures such as encryption, secure authentication, and fraud detection to protect sensitive user data.

- **Mobile Analytics and Customer Insights:** Information systems in m-commerce collect and analyze data from mobile transactions and interactions. This data helps businesses gain valuable insights into customer behavior, preferences, and purchasing patterns, aiding in decision-making and marketing strategies.
- **Mobile Supply Chain Management:** Information systems play a vital role in managing the mobile supply chain. Mobile technologies help track inventory, streamline logistics, and enable real-time communication between stakeholders involved in the supply chain.
- **Integration with E-Commerce Systems:** M-commerce information systems often need to integrate with existing e-commerce platforms and backend systems. This integration ensures seamless data flow, consistent customer experiences, and unified management of transactions.
- **Mobile Customer Relationship Management (CRM):** Effective CRM systems integrated with m-commerce help businesses provide personalized customer support and engagement. It allows businesses to maintain a strong relationship with customers and enhance their loyalty.
- **Mobile Social Commerce:** Social media integration is increasingly significant in m-commerce. Social commerce features leverage social platforms to facilitate product discovery, user reviews, and sharing, enhancing user engagement and trust.
- **Mobile Innovations and Emerging Technologies:** As technology evolves, m-commerce information systems must adapt to new innovations such as augmented reality (AR), virtual reality (VR), and voice-based interactions to enhance the overall mobile shopping experience.

#### 1.4.2 M-COMMERCE: ANYTIME, ANYWHERE COMMERCE

M-commerce, often referred to as "**anytime, anywhere commerce**", is a form of electronic commerce that enables users to conduct business transactions using mobile devices, such as smartphones and tablets, regardless of their location or the time of day. It allows consumers to access online stores, browse products, make purchases, and conduct financial transactions at their convenience, without the need for a physical presence at a fixed place or the use of a desktop computer. This is a major advantage over traditional e-commerce, which is typically limited to the home or office.

The key characteristics of "anytime, anywhere commerce" are as follows:

- **Mobility:** M-commerce leverages the mobility of smartphones and other portable

devices, enabling users to shop and interact with businesses on the go. Users can access online stores and services from virtually anywhere, as long as they have a reliable internet connection.

- **Convenience:** M-commerce offers unparalleled convenience for consumers. Whether they are commuting, waiting in line, or relaxing at home, users can access e-commerce platforms and make purchases instantly, without the need to visit a physical store or use a desktop computer.
- **24\*7 Accessibility:** Unlike traditional brick-and-mortar stores, m-commerce platforms are accessible 24 hours a day, seven days a week. Consumers can shop at any time that suits them best, even during non-business hours.
- **Personalization:** M-commerce platforms often employ personalization techniques, using data from user interactions and behavior to offer tailored product recommendations, promotions, and discounts.
- **Mobile Payment Solutions:** M-commerce relies on mobile payment solutions to facilitate secure and convenient transactions. Mobile wallets, digital payment apps, and other contactless payment methods make it easy for consumers to complete purchases with just a few taps on their mobile devices.
- **Location-Based Services:** M-commerce leverages location-based services to provide users with localized information, such as nearby stores, deals, and promotions based on their current location.
- **Real-Time Communication:** Mobile devices enable real-time communication between businesses and customers. This allows for immediate customer support, order updates, and feedback.
- **Integration with other Technologies:** M-commerce often integrates with other emerging technologies, such as augmented reality (AR) and virtual reality (VR), to enhance the shopping experience and bridge the gap between the digital and physical worlds.
- **Social Commerce:** Social media platforms play a significant role in m-commerce, enabling businesses to engage with customers and leverage user-generated content to influence purchasing decisions.
- **Seamless User Experience:** The success of anytime, anywhere commerce relies on providing a seamless user experience across different mobile devices and operating systems. Mobile applications and websites must be user-friendly, responsive, and easy to navigate.

- **Global Reach:** M-commerce breaks geographical barriers, allowing businesses to reach a global audience. Customers from different parts of the world can access and interact with online stores, expanding the market reach for businesses.

### 1.4.3 SCOPE OF M-COMMERCE

M-commerce provides instant connectivity between mobile users regardless of their geographic location or time of day. With the tremendous growth of wireless and mobile technology and the rapid production of cell phones in developing countries around the world, the scope of m-commerce has expanded many times over. With the advent of super-fast 4G access technology, which ensures high-speed data transmission rates in the order of 50Mbps, m-commerce opens up new perspectives for digital media applications. So, it is now possible for mobile users to watch their favourite TV programmes or download and view famous movies in their mobile devices while travelling.

Downloading MP3 music, playing online games or participating in live video conferencing while in transit have become a reality now. Apart from such audio/video applications, SMS-based text messaging is widely accepted in day-to-day business transactions. Whether to display product promos, to announce new product launches or to give attractive discounts, SMS have become an effective tool for mobile marketing. SMS-based advertisements have become an integral part of m-commerce. The role that SMS play in giving instant support to customers in the event of any kind of product failures or delivery delays cannot be ignored or downplayed.

Another major application area of m-commerce is in the field of *micro payments*. Mobile devices will replace users' debit/credit cards in the near future. The mobile phone replaces the money in your pocket and offers an affordable, low-risk alternative to credit / debit cards to pay anytime, anywhere and for anything.

In SMS-based transactional payments, the mobile phone is used to send a PIN (Personal Identification Number) to a bank for authorization purpose. After the successful verification of the PIN by the bank, the user sends a payment request through an SMS from his/her mobile to the bank. The payment is done through an account transfer by the bank and both the payer and payee get an SMS from the bank regarding the successful completion of the payment. Thus, a completely cash less payment is made using the mobile phone within 10 to 15 seconds.

Fig. 1.5 shows scope of Mobile Commerce.

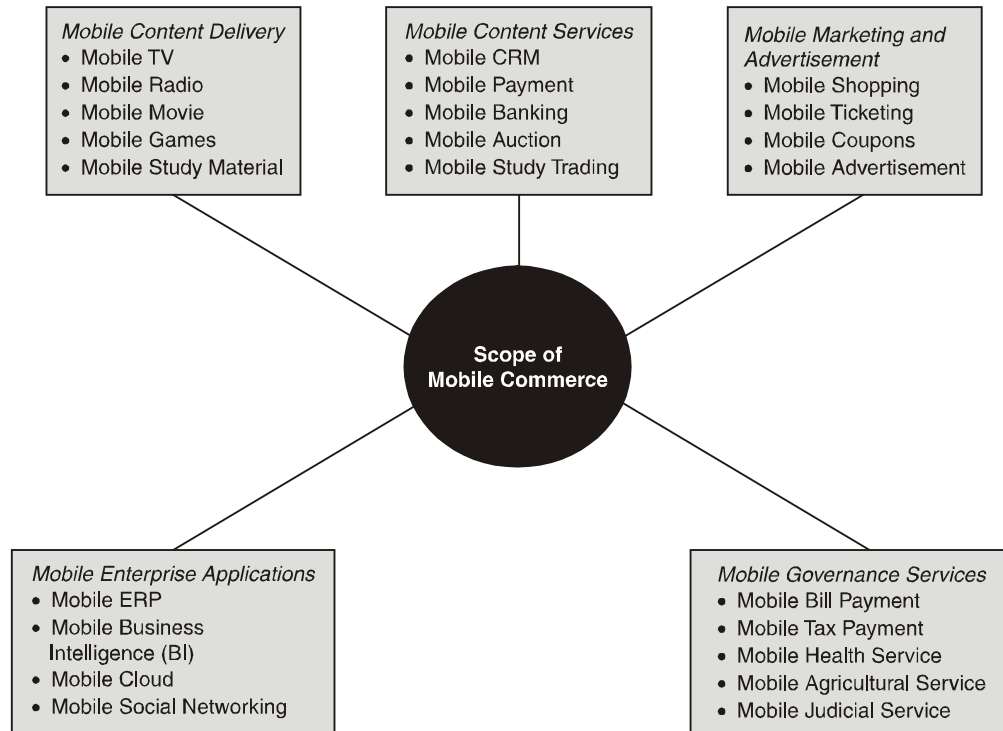


Fig. 1.5 (Scope of Mobile Commerce)

Mobile Commerce offers a range of location-based services, such as tracking and monitoring people / vehicles, identifying or finding the nearest ATMs / banks / hospitals / restaurants and local weather / traffic reports.

*People tracking* can help in criminal investigation where the mobile phone used by a criminal can be tracked and its location is identified.

*Vehicle tracking* is used to determine the actual position of the goods to be delivered and helps in supply chain operation management.

The local traffic and weather report can be created in a local office and delivered to a user's mobile phone if desired. The local bank / ATM / hospital / restaurant information can also be delivered to a mobile user at minimal cost.

The scope of mobile commerce is ubiquitous, gradually covering all aspects of the lives of modern citizens. From mobile banking, mobile browsing and mobile ticketing to mobile marketing, mobile advertising and mobile computing, mobile commerce is gradually becoming an integral part of both the corporate world and the common people.



With the prices of mobile phone decreasing exponentially and the number of different mobile applications increasing enormously, more and more people will indulge in m-commerce applications and soon it will become the preferred choice of the digital business world.

#### **1.4.4 BENEFITS OF MOBILE COMMERCE**

The main advantage of mobile commerce is that it gives the mobile users instant connectivity regardless of their geographic location and time of the day. The mobile user can stay connected to his/her company network and collect information, even when he/she is in transit and remotely located away from the company installation. The same light weight mobile device can be used for making business transactions or making online payments 24 x 7 in a cost-effective way.

The major benefits of mobile commerce are as follows:

##### **□ Anytime - Anywhere**

Mobile commerce together with wireless communication technology and wireless broadband internet access, keeps the mobile user connected with the internet while travelling across the globe. The business information is available to the mobile user any time of the day and anywhere around the globe. This anytime/anywhere internet access makes business transactions more flexible and customer communications more efficient, which in turn improves the productivity of the company and increases customer satisfaction. The valuable market information, stock/share prices, inventory position, delivery schedule, etc. are instantly available at the fingertips. The round the clock (24 X 7) internet availability benefits many users to conduct business transactions from their homes or from any other place while on the move and at any convenient time. Thus m-commerce offers greater mobility and flexibility to mobile users in performing business transactions using their handheld mobile devices.

##### **□ Good Business Opportunities**

The number of mobile users is increasing day by day, so through M-Commerce your business gets large and growing market place for a variety of goods and services.

##### **□ Good Marketing Tool**

M-commerce also helps businesses target customers according to their location, service provider, the type of device they use and various other criteria. This can be a good marketing tool.

### □ **Process Multiple Orders**

Mobile commerce allows businesses to process multiple orders at once. There are no long checkout lines, and customers can buy products at any time.

### □ **Cost-effective**

The costs of transactions using mobile devices are relatively low. The critical business data, such as reports, photographs, etc. can be captured and transmitted easily from the mobile devices without involving any bulky expensive equipment. The customer queries can be attended and support provided instantly from the mobile device, thus making customer support more comprehensive. The SMS-based micro payments facilitate bank account transfer within a few seconds and at the cost of an SMS. In case of mobile billing, users can pay for electricity bills, telephone bills, petrol, grocery, etc. through their mobile phones. The payments made in the mobile phones for such items will appear as part of their mobile phone bills, thus eliminating the need for a third party payment mechanism such as, credit cards. This reduces the cost of payment to a large extent.

### □ **Personalized Service**

Mobile commerce offers a number of personalized services to the mobile users depending on their various requirements and purposes. The digital cellular technology can monitor the location of user performing mobile transactions. Knowledge of the user's location may be used to deliver timely and useful contents such as product availability and discount information to the potential customer. Timely information, such as flight schedules and flight availability can be delivered to the user at the last minute. Delivery of time critical as well as emergency information, SMS-based notifications and alerts can be easily made if the location of the user is tracked. The location tracking is also utilized in offering customized services to the user, such as delivery of discount coupons that can be cashed in and around of the location of the customer. Delivery of regional maps, driving directions and online directories are also possible if the location of the mobile user is known. Another major advantage of location tracking is that, in criminal investigation, the location of the mobile user can be monitored and recorded as part of the investigation process.

### □ **Savings**

Companies try to reach to the consumer directly through M-Commerce, so users have no need to go far to the store physically and at the end it saves user's time and money.

## 1.4.5 LIMITATIONS OF MOBILE COMMERCE

Although mobile commerce has some distinctive advantages, such as instant connectivity and location and time independence over electronic commerce and offers low cost personalized services to the mobile users, it suffers from some serious limitations which restrict its use in mainstream business world. The mobile device limitations, such as small screen size, small memory capacity and lower processor speed makes it unsuitable for high quality internet graphics applications. The limited availability of bandwidth to various mobile operators imposes a limitation on the speed of operation of different mobile commerce applications. The wireless networks used in mobile commerce are more vulnerable to external hacker attacks compared to wired networks and stringent security arrangements in the form of encryption and authentication should be adopted to prevent unwanted intrusions.

The main disadvantages of mobile commerce are explained in detail below:

### 1.4.5.1 Mobile Device Limitations

#### □ **Small Screen Size and Poor Resolution**

Mobile devices have smaller screen size and poor resolution which makes them inconvenient for browsing applications. Data entry can be quite difficult using small combinational keypad that comes with most of the mobile hand held devices. The wide and high resolution screens in conventional desktops or laptops used in e-commerce applications offer ease of use in data entry operations as well as viewing web pages. These larger screens support 1920 X 1080 resolution and 3D graphics display. Although mobile devices offer greater mobility and flexibility in accessing information, the smaller screen size restricts the amount of information that could be presented and offers a less convenient user interface in the form of menu-based scroll-and-click mode of data entry.

#### □ **Low Speed Processor**

Most mobile devices are equipped with low-powered processors with a much slower processing speed compared to the more sophisticated processors used in desktops or laptops. Such low speed processors limit the download speed in most mobile commerce applications. The applications requiring too much processing power should be avoided as they may become irritably slow due to low speed processors. Also, keeping the low processor speed in mind, the mobile websites must be optimized to ensure customer satisfaction. Unnecessary plug-ins, flash images and animations should be removed to ensure speed of delivery.

#### □ **Small Storage Capacity**

The mobile devices do not have large storage space. The storage capacity in mobile devices is in the order of 32GB to 128 GB compared to 2TB or higher used in desktops/laptops. So, it is difficult to store large video files in mobile devices for future use. The mobile application developers must be concerned about the size of their applications during the development phase.

#### □ **Low Power Backup**

Mobile devices use batteries as their power supply. Normally, power for a mobile device lasts up to 2-3 days, depending on the size of the device. After this time, the battery should be recharged, which puts additional strain on the user, who has to remember to recharge it from time to time.

### **1.4.5.2 Wireless Network Limitations**

Mobile commerce depends on wireless networks, which are typically slower than wired networks. In many cases, wireless networks offer one fourth speed of standard wired network. Also, most wireless networks are more common in urban areas and some of the rural areas might not have wireless communication facilities. So online mobile services may become unavailable in some rural areas, and thus the popularity of mobile services may be suffered. Unless the mobile device is compatible with 3G or 4G technology, the applications become sluggish and unreliable compared to wired network applications. Atmospheric disturbances and the fading of signals transmitted over wireless networks sometimes cause serious data errors and can even lead to disconnections.

### **1.4.5.3 Bandwidth Restrictions**

A major disadvantage of mobile commerce is the bandwidth limitation, which imposes a limitation on speed of operation in various m-commerce applications. Wireless networks use frequency spectrum to transmit information across the network. Regulatory bodies control the use of available frequency spectrum and allocate the spectrum to various mobile operators. In India, the frequency spectrum were initially allocated and regulated by Department of Telecommunication (DOT). Later, the Telecom Regulatory Authority of India (TRAI) was set up to control the usage of frequency spectrum. The limited availability of bandwidth to various mobile operators in turn restricts the data rate in mobile commerce applications.

#### 1.4.5.4 Security Issues

Another concern that is often raised in connection with mobile commerce is the security issue. Mobile devices are more vulnerable to theft, loss and mishandling. Special care must be taken to ensure that the security and privacy of the mobile phone customer are not compromised if a mobile device is lost. This includes that sensitive information is not stored on the mobile devices and that the PIN / password can be changed / blocked quickly and easily if necessary.

Mobile commerce employs public wireless networks for transmission of signals which can be easily intercepted by hackers for capturing/altering stream of data travelling through the wireless medium. In wired networks, in order to gain access, the intruder has to gain physical access to the wired infrastructure. In wireless networks, anyone with the ability to receive signal in a mobile device can gain access to the network. In order to protect the wireless network from unwanted users, various encryption and authentication techniques should be employed.

Authentication of mobile devices prior to carrying out any financial transaction is another important issue. The *Subscriber Identity Module (SIM)* stores the subscriber identity in the form of cryptographic keys. The authentication server of the wireless network stores the matching keys and verifies the user identity prior to any transaction. While it is much easier to intercept signals over wireless networks, the encryption and authentication mechanism makes it difficult for the unwanted user to decrypt.

### 1.5 IMPACT OF MOBILITY ON E-COMMERCE

The advent of wireless and mobile technology and the rapid arrival of mobile devices in modern society have created new opportunities for the corporate world.

In general, mobile commerce or m-commerce is viewed as an extension of traditional internet-based e-commerce. The impact of mobility on e-commerce has been significant. Mobile devices have become increasingly popular, and people are using them to shop online more and more. However, because the number of mobile device owners is far larger than that of internet users, mobile commerce has a huge impact on the daily activities of both customers and business owners. In fact, m-commerce is now a major part of the e-commerce landscape.

There are a number of reasons why mobility has had such a big impact on e-commerce.

- First, mobile devices are always with us, so we can shop online anytime, anywhere.

This is a major advantage over traditional e-commerce, which is typically limited to the home or office.

- Second, mobile devices are becoming more powerful and feature-rich. This means that we can now shop online using a wider range of features, such as touch screens, cameras, and GPS. This makes the shopping experience more convenient and enjoyable.
- Third, mobile payment methods are becoming more popular. This makes it easy and secure to make purchases online using our mobile devices.

As a result of these factors, m-commerce is growing rapidly. In **2021**, m-commerce sales worldwide reached **\$4.9 trillion**. This is expected to grow to **\$7.4 trillion** by **2025**.

The impact of mobility on e-commerce is likely to continue to grow in the future. As mobile devices become even more powerful and feature-rich, and as mobile payment methods become more popular, we can expect to see even more people shopping online using their mobile devices.

Here are some of the specific impacts of mobility on e-commerce:

- **Increased Sales:** Mobile commerce has led to increased sales for many e-commerce businesses. This is because mobile devices make it easier for people to shop online, and because more people are using mobile devices to shop.
- **New Customer Acquisition:** Mobile commerce has also helped businesses to acquire new customers. This is because mobile devices allow businesses to reach a wider audience, and because mobile ads are often more effective than traditional ads.
- **Anytime, Anywhere Shopping:** As mentioned earlier, mobility enables "anytime, anywhere" commerce. Consumers can shop and make purchases 24/7, without being restricted to traditional store hours. This convenience has led to increased online shopping activity and higher sales for e-commerce businesses.
- **Improved Customer Service:** Mobile commerce has also helped businesses to improve customer service. This is because businesses can now use mobile devices to provide customer support 24/7.
- **New Business Models:** Mobile commerce has also led to the development of new business models. For example, some businesses are now offering mobile-only products and services.

- **Mobile-Friendly Websites and Apps:** The rise of mobility has compelled businesses to adopt responsive web design and create mobile applications to ensure an optimal user experience on smaller screens. Mobile-friendly websites and apps contribute to higher conversion rates and customer satisfaction.
- **Global Market Reach:** Mobility has opened up e-commerce to a global market. Businesses can reach international customers and expand their customer base beyond geographical boundaries, increasing sales and revenue potential.

By providing instant internet connectivity and greater mobility to billions of mobile users, m-commerce is redefining the relationship between customers and providers of goods and services. It is predicted that in the near future mobile commerce will significantly influence the marketing orientation of almost all major industrial sectors and thus change the general market dynamics. In addition to providing mobility and location tracking for users, m-commerce applications are able to achieve a high level of personalization and offer interaction with the individual customer. In a highly interactive environment, personal profiles, product preferences, home and office locations, payment details, etc. can be captured directly from the customer's mobile devices to create an accurate and personalized database.

Conversational advertising can be delivered directly to the mobile phone from a brand to describe the benefits of the product. This is an emerging concept where the mobile user can sign up to receive product information from a brand by providing the company with the mobile phone number. By using the location tracking of M-Commerce, special customer zones can be created, which are identified by specific customers with different product preferences. The customers of a zone can be dynamically informed about various discounts and offers in the local shops. Knowledge of customer numbers and preferences in a zone will help the suppliers to estimate the demand for a particular product, and also let the customers be informed instantly about any discounts/price reduction offered in nearby stores.

The popularity of mobile entertainment is growing rapidly. These include mobile phone gambling, mobile collaborative games, mobile sport video and mobile television. With the rapid development of sophisticated mobile applications, the mobile game business is growing rapidly. Developments in technologies such as mobile video sequencing, mobile video transcoding and mobile video communication play a key role in the success factor of the mobile entertainment industry.

Similarly, in healthcare, mobile medical imaging is enabled through the use of a 3G/4G wireless network. In the education industry, mobile learning is being introduced in the form

of SMS or text messages. With the help of mobile learning or M-learning, people can save their time, energy and money, they can learn at home, office, and even during travelling.

With the introduction of newer display technologies, such as electronic paper, liquid crystal display and digital paper, the mobile electronic readers or e-books have become commonplace. A large number of mobile users have started carrying e-readers to download online books or online newspapers while travelling.

The impact of m-commerce is universal and constantly expanding. With the cost of mobile devices going down and introduction of newer and powerful technologies, more and more people are indulging in numerous mobile applications and eventually m-commerce is becoming the preferred tool for conducting business transactions on the go.

## **1.6 MOBILE COMMERCE FRAMEWORK**

Despite of the described limitations, numbers of people performing m-commerce transactions are growing exponentially. As m-commerce provides mobility for busy professionals, more and more people are tending to access the Internet on their mobile phones. The day-to-day functioning of individuals as well as business corporations is being transformed to mobile applications and is embedded in mobile devices. The mobile network operators have started providing Value-Added Services (VAS) that supports the new concepts of anytime anywhere computing. Accordingly, a new mobile business model has emerged that is based on a joint distribution of sales through sales in the respective channels. In mobile retail, for example, diverse mobile applications are being developed that enable the multi-channel retailer to carry out key functions such as mobile promotions, mobile payment, product information display, order management, catalogue management, create and display shopping lists, loyalty programs and other value-added services. Similarly, in the travel industry, location-based tourism, mobile ticketing, navigation guidance and the provision of local weather and traffic information lead to new opportunities for generating sales. In order to make these value-added services work efficiently, and in a cost-effective manner, perfect collaboration between various network providers, technology providers and application developers is required. In order to integrate different mobile services, applications and technologies in a well-coordinated and controlled architecture, a mobile commerce framework needs to be developed. The purpose of the framework is to develop a structured integration of mobile services, applications and technology resources in order to provide a diverse range of value-added services in various industrial sectors while reducing operating costs and improving efficiency in order to attract the end-user population.



The mobile commerce framework consists of the FOUR basic building blocks as follows:

- (1) Content Management                      (2) Technology Infrastructure  
 (3) Application Development              (4) Business Service Infrastructure

Fig. 1.6 depicts the Mobile Commerce Framework.

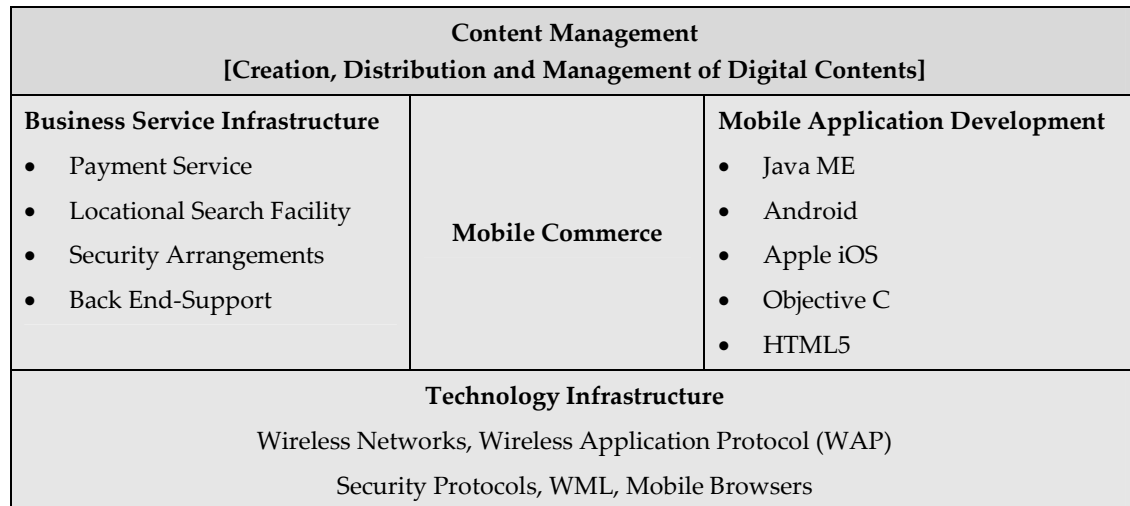


Fig. 1.6 (Mobile Commerce Framework)

## (1) Content Management

This component deals with the creation, distribution and management of a wide variety of media-rich digital content that can be browsed through the small screens of mobile devices.

The digital content is used in conducting various business transactions such as buying and selling goods, making online payments, promoting products and providing online customer support. An important part of content management is the ability to track different content providers and to maintain and manage the relationships between them. The security and authenticity of the content must be guaranteed and the access control mechanism must be provided to prevent misuse of the document by unwanted users. The content distribution, rights management and clearing financial settlements, all come under the content management module.

## (2) Technology Infrastructure

This component deals with the distribution of digital contents and transaction details over wireless communication networks to customer locations or other business installations.

The wireless network infrastructure forms the basis of the mobile commerce framework as it fulfils the basic requirements of data transmission between different business partners when carrying out any business transaction.

The technology infrastructure includes wireless communication technology, Wireless Application Protocol (WAP) and mobile security technology. These technologies need to support digital content distribution, mobile application development and distribution and also provide a secure technological platform for mobile billing and prepaid services through the use of mobile Virtual Private Networks (VPN).

### **(3) Application Development**

The application development component of mobile commerce framework deals with the diverse range of mobile commerce applications. The main purpose of these mobile applications is to make the product information available to the end users and also to enable them to conduct mobile business transactions. There are four main categories of mobile applications, namely information applications, communication applications, entertainment applications, and commerce applications. Several mobile applications, such as mobile ticketing, mobile banking, mobile advertising, mobile office applications, etc. fall under these categories. These applications support important business functionalities in the respective industries and are intended to generate higher sales and reduce costs. Sometimes multiple applications are combined to provide an aggregated service, resulting in a further cost reduction. With the rapid development of various emerging mobile technologies, application development is going through an evolutionary stage. In order to meet the requirements of today's rapidly evolving markets, the mobile applications must be developed in an innovative manner so that it allows the service provider to quickly address the growing demands of the market and also at the same time offer more profitability and greater cost reduction.

### **(4) Business Service Infrastructure**

The business service infrastructure forms the backbone of the mobile commerce framework. It supports the back office functions such as payment services, location and search functions as well as security measures of the mobile commerce systems. The production and fulfilment of these services are beyond the capabilities of traditional telecommunications service providers. These services are managed and provided by some third party providers who have the ability and experience to provide such functions. They maintain the necessary infrastructure to support secure financial transactions in mobile

commerce environments and also provide back-end support for search and other facilities. Such back office systems should be flexible enough and also be able to provide new services quickly. They have a direct impact on the end-user experience and have the greatest impact on the success or failure of the service provider. With the help of such back office infrastructures, mobile service providers can avoid upfront investments in IT, and these managed services also offer service providers the opportunity to switch quickly to the newer technological environment without significant investments.

Above four components are the four pillars of mobile commerce framework and all-commerce activities revolve around them. Whenever a mobile user tends to download MP3 music or a latest movie in his/her mobile device, sends an SMS requesting online payment to a bank, submits online order form requesting purchase in a mobile browser or books a mobile airline ticket, he/she is indulging in either or all four of the above mobile commerce framework components. In order to cope with the dynamic nature of the modern day lifestyle, people are demanding more mobility in accessing their business applications. A properly integrated and well-coordinated mobile commerce framework needs to be developed in order to provide easy-to-use and secure mobile services to end customers. The main purpose of a structured and balanced mobile commerce framework is to enable businesses to adapt quickly to the latest mobile technologies and ensure customer loyalty by providing them improved and enhanced services in sync with the growing market demands.

## **1.7 M-COMMERCE BUSINESS MODELS**

A business model determines the path or process through which a business organization can achieve some profit. It shows how an organization can make an investment, add some value to the investment, get a finished product or service, and generate income by selling the product or service. The income generated from the sale must exceed the operating costs for the company to make a profit. Business models specify the mechanism for generating profit margins and maintaining them in the value chain. Thus, business models help managers with the strategic planning and formulation of the entire business strategy of the organization. E-commerce has some traditional business models that are widely used by all of the major e-commerce providers around the world. These include the dealer model, broker model, service provider model, advertiser model, etc. Mobile commerce business models differ from electronic commerce because of their fundamental differences in operation and technology. Since mobile commerce gives users additional mobility, the business models also reflect the nature of mobility. The four most important services of

mobile commerce are payment services, mobile advertising, mobile shopping and mobile entertainment. Accordingly, the business models of mobile commerce also revolve around these four applications.

The four major mobile commerce business models are described below:

### **(1) Payment Model**

In this model, mobile payment service providers offer mobile payment services that enable users to conduct cashless payment transactions including bank transactions, stock trading, tax / bill payments, and ticket or other retail purchases using a credit / debit card or bank PIN. The payment service providers work with banks (or other financial institutions) and / or mobile network operators and accordingly receive a bank-controlled mobile payment model or an operator-controlled mobile payment model. The payment service provider charges a certain percentage fee for each payment transaction made using the payment application. Alternatively, the user can pay a nominal monthly subscription fee to the payment service provider and can use the service as and when required.

### **(2) Advertiser Model**

This model is an extension of traditional e-commerce advertiser model and provides mobile websites that can be viewed by mobile users on their portable mobile devices. Advertising companies can display their advertising messages on the website and pay a rental fee to the hosting website for displaying their messages. These mobile advertising websites usually offer users some basic services such as email services, search engines, news services or social networking services, and publish promotional messages on these websites for wider reach. The advertisements often come with purchase buttons that allow users to purchase the product directly from their mobile devices. The mobile payment service is also provided to facilitate mobile purchase directly from the advertising websites. The advertising companies pay a fixed fee to the advertising website for the presentation of their advertising messages. Additional revenue is generated for every purchase transaction the user makes through the website

### **(3) Shopping Model**

This model is similar to the e-commerce retailer model, in which retailers create mobile websites to display their range of products on customers' mobile devices. The mobile users can browse the mobile websites on their WAP enabled mobile screens and select and purchase any product of their choice. Mobile payment option is also provided in the website so that the users can make mobile payment for the purchased product and complete the

deal even while in transit or far away from the actual store location. Thus, shopping model allows retailers to generate additional revenues through mobile shopping and can improve their profit margins.

#### (4) Content Provider Model

In this model, mobile service providers offer a variety of entertainment content such as breaking news, weather forecast, traffic information, music, mobile games, TV shows, video content, movies, etc., which can be downloaded to users' mobile devices. Network operators are connected to various content providers and offer mobile customers both subscription-based services and pay-per-use services. Location-based services, such as map-based navigational services, discount coupons offered in local retail stores or restaurants, news of local events, etc. are also delivered in customer mobile devices. The revenue is generated through subscription fees (for news, traffic/weather updates, movies, and games), usage fees (TV shows, videos, games etc.) or data download fees (for e-mails, e-books, etc.). Various media houses, press agencies or content aggregators follow this model in order to generate additional income via the mobile channel.

### 1.8 E-COMMERCE V/S. M-COMMERCE

E-Commerce	M-Commerce
The process of buying and selling products or services over the internet by using personal computers or laptops is called as <i>E-commerce</i> . It refers to ' <i>Electronic commerce</i> '.	The process of buying and selling products or services over the internet by using wireless handheld devices (like- mobile phones or tablets) is called as <i>M-commerce</i> . It refers to ' <i>Mobile Commerce</i> '.
E-commerce activities are performed with the help of desktop computers and laptops.	M-commerce activities are performed with the help of mobile devices like- smartphones, tablets, PDA's (Personal Digital Assistant) etc.
E-commerce is an older concept developed in 1970's.	M-commerce is a newer concept developed in 1990's. It is actually a subset of e-commerce.
In e-commerce, the use of internet is mandatory.	In case of m-commerce, some activities can be performed without internet also. Like- Sending SMS to promote a product/service via. Mobile.
Its reachability is comparatively low than the m-commerce as it is not so good in portability.	Its reachability is more than that of e-commerce only due to the use of mobile devices.

In e-commerce, location tracking capabilities are limited due to the non-portability of devices.	In m-commerce, location tracking capabilities is so good as mobile apps track and identify user locations with the help of GPS technology, Wi-Fi, and so on.
E-commerce fails in push notification.	In m-commerce, push notification can be achieved.
Mobility is high. Users can make transactions everywhere as long as they are connected to the Internet.	Mobility is low. Users can make transactions on their computers and laptops with limited mobility.
M-commerce is available anyplace you go, even if there is no internet.	For E-commerce, you still need to go to a place where there is internet to access your online transactions.
Examples of E-commerce include: <i>Amazon, Flipkart, Quikr, OLX</i> websites.	Example of M-commerce include: mobile banking like- <i>Paytm</i> .

## 1.9 M-COMMERCE VALUE CHAIN

The m-commerce value chain is a model that represents the various stages and actors involved in the process of conducting mobile commerce transactions. The value chain includes the following key components:

- **Content and Service Providers:** These are the entities that create and offer digital content, products, and services that are made available to mobile users. They can be app developers, content creators, or service providers offering a range of services like mobile apps, games, streaming services, mobile banking, etc.
- **Mobile Device Manufacturers:** These companies design, manufacture, and market the mobile devices used by consumers to access m-commerce services. They include brands like- Apple, Samsung, Google, and various other smartphone manufacturers.
- **Network Operators:** Mobile network operators provide the infrastructure and connectivity that enables mobile devices to access the internet and mobile data services. They can be wireless carriers like- Reliance Jio, Bharti Airtel, BSNL, and Vodafone, etc.
- **Mobile Payment Providers:** These are the companies or services that facilitate secure and convenient mobile payment options for customers. Examples include digital wallets (e.g., PayTm, Google Pay), mobile banking apps, and other payment processors that handle transactions.

- **Mobile Commerce Platforms:** These platforms act as intermediaries between content and service providers and consumers. They offer a marketplace or ecosystem where businesses can list their products and services for mobile users to discover and purchase.
- **Advertising and Marketing:** This aspect involves mobile advertising agencies, marketing companies, and ad platforms that promote m-commerce offerings to the target audience through mobile devices.
- **Regulatory and Security Bodies:** These are entities responsible for ensuring compliance with regulations, protecting consumers' privacy and data, and maintaining the security of m-commerce transactions.
- **Logistics and Delivery:** In case of physical goods, this stage involves shipping and delivery services responsible for fulfilling orders and delivering products to the customers.
- **Customer Support and After-Sales:** Companies and services that handle customer inquiries, complaints, and support for mobile commerce products and services after the sale has been made.

Each stage in the m-commerce value chain plays a critical role in enabling seamless and secure mobile commerce transactions, from content creation to the delivery of goods and services to the end-users. Collaboration between these actors is essential to ensure a smooth and successful m-commerce experience for consumers.

The m-commerce value chain is a complex system, but it is essential for the delivery of mobile commerce services to consumers. By understanding the different players involved in the value chain, businesses can develop strategies that will allow them to succeed in the m-commerce market.

Here are some of the key attributes of the m-commerce value chain:

- **Ubiquity:** Mobile devices can be used anywhere, which makes m-commerce a very convenient way to shop.
- **Convenience:** M-commerce transactions can be completed quickly and easily, which makes them a popular choice for consumers who are on the go.
- **Instant connectivity:** Mobile devices are always connected to the internet, which means that m-commerce transactions can be completed in real time.
- **Personalization:** M-commerce platforms can be personalized to the individual user, which makes the shopping experience more relevant and engaging.

- **Localization:** M-commerce platforms can be localized to specific regions, which makes it easier for consumers to find and purchase products and services that are relevant to their needs.

The m-commerce value chain is a dynamic and ever-evolving ecosystem. As new technologies and business models emerge, the value chain will continue to change.

## **1.10 M-COMMERCE INFORMATION SYSTEM FUNCTIONAL MODEL**

The M-commerce Information System Functional Model outlines the key functionalities and components required to support mobile commerce operations. It describes the various aspects of an information system that enable businesses to conduct m-commerce transactions and provide a seamless experience to mobile users.

Below are the primary components of the M-commerce Information System Functional Model:

- **User Interface:** The user interface is the front-end component that interacts with mobile users. It should be designed to be responsive, user-friendly, and optimized for mobile devices, providing an intuitive and engaging experience.
- **Mobile App / Website:** This component represents the mobile application or mobile-optimized website through which users can access m-commerce services and products. It should support various functionalities such as product browsing, search, shopping cart management, and payment processing.
- **Mobile Payment Gateway:** The mobile payment gateway facilitates secure and convenient payment processing for mobile transactions. It integrates with various payment methods like- credit/debit cards, digital wallets, mobile banking, etc., to enable smooth and secure payments.
- **Product and Service Catalog:** The information system should maintain an up-to-date catalog of products and services offered in the m-commerce platform. This includes detailed product descriptions, images, pricing, availability, and other relevant information.
- **User Accounts and Authentication:** The system should support user registration, login, and authentication mechanisms to ensure secure access to personalized services, account information, and transaction history.
- **Order Management:** This component manages the processing of customer orders,



including order placement, order status updates, order tracking and coordination with logistics for delivery.

- **Inventory Management:** The inventory management system tracks the availability of products and services, updating the stock levels in real-time, and ensuring that customers are not sold items that are out of stock.
- **Mobile Analytics:** Mobile analytics tools provide valuable insights into user behavior, preferences, and purchasing patterns. This information can be used to optimize the m-commerce platform, enhance user experience, and refine marketing strategies.
- **Security and Encryption:** Security measures, such as data encryption, secure socket layers (SSL), and two-factor authentication, are vital to protect sensitive user information and ensure secure transactions.
- **Customer Support:** This component offers customer support features like- chat support, FAQs, and contact forms, allowing users to seek assistance or resolve issues related to their purchases.
- **Push Notifications and Alerts:** The system can utilize push notifications to inform users about new products, special offers, order updates, and other relevant information.
- **Mobile Marketing and Promotions:** The system should support targeted marketing and promotional activities, allowing businesses to reach their mobile customers with personalized offers and campaigns.
- **Feedback and Reviews:** This functionality enables users to provide feedback, ratings, and reviews for products and services, helping other customers make informed decisions.

The M-commerce Information System Functional Model serves as a blueprint for designing, developing, and operating an effective and efficient mobile commerce platform, ensuring a seamless and engaging experience for mobile users while supporting the business's growth and success in the mobile marketplace.

## QUESTIONS

### Short Answer Questions

Q.1. What is E-Commerce?

Ans: E-Commerce stands for 'Electronic Commerce'. It refers to buying and selling of goods, products, or services over the internet. E-Commerce is a methodology of

modern business, which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery.

The term '*e-Commerce*' also comprises other activities including- online auctions, internet banking, payment gateways, and online ticketing.

Some popular e-Commerce platforms are: Amazon, Flipkart, Myntra, IndiaMART, and Snapdeal.

**Q.2. Discuss the major objectives of E-Commerce.**

**Ans:** The various objectives that businesses typically strive to accomplish through e-commerce are:

- To provide online customers with quick delivery of products or services.
- To gain access to a worldwide market.
- To increase sales in existing market and opening new market.
- To develop business opportunities over the internet.
- To improve productivity and competitiveness.
- To improve customer experience and satisfaction.
- To offer more customizable products.
- To keep the virtual shop open 24x7.

**Q.3. What is Mobile Commerce?**

*Or*

**What is M-Commerce?**

**Ans:** Mobile commerce, also known as *m-commerce*, is defined as the process of conducting commercial transactions such as online banking, paying bills or making purchases using portable mobile devices like- *mobile phones or tablets* online.

You can't use your laptop or PC (Personal Computer) everywhere, but you can use your mobile phones easily. You can do online shopping while travelling, transfer money easily with the help of mobile phones. Thus, this wireless solution is very much helpful and rising day by day.

**Q.4. Explain the types of M-Commerce.**

*Or*

**Define the following in M-Commerce:**

**(a) Mobile Shopping**

(b) **Mobile Banking**

(c) **Mobile Payment**

**Ans:** M-commerce can be categorized by function as:

(a) **Mobile Shopping**

Mobile shopping allows a customer to purchase a product online from a mobile device using an application such as *Amazon* or *Flipkart*.

(b) **Mobile Banking**

Mobile banking is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device such as a smartphone or tablet. Unlike the related internet banking it uses software, usually called an *app*, provided by the financial institution for the purpose. Mobile banking is dependent on the availability of an internet or data connection to the mobile device.

(c) **Mobile Payment**

Mobile payment is a money payment made for a product or service through a mobile phone. Mobile payment technology can also be used to instantly send money to friends or family members. Digital wallets like- *Paytm*, *Google Pay*, etc. allow a customer to make payments without swiping a card or paying with physical cash.

**Q.5. List the key benefits of M-Commerce for Business.**

**Ans:** The key benefits of M-Commerce for Business are listed below:

- Ease of Access
- Marketing
- Fast Transactions
- Wide Range of Products
- Lower Costs
- Higher Productivity
- Attracting New Customers

**Q.6. How is 'Mobile Commerce' different from 'E-Commerce'?**

**Ans:** M-commerce is actually just a subset of e-commerce. It is a fast growing sector of e-commerce. The only difference is that users don't require a laptop or PC for this purpose. They can use portable devices like- smartphones and tablets. This way,

users can access online shopping sites as well as other online services anywhere and anytime.

Mobile commerce, which uses wireless technology, offers some additional advantages over internet-based e-commerce. In *e-commerce*, the internet provides information at any time of the day; in *m-commerce*; the information is available anytime, anywhere. In e-commerce, the information is available as long as the user is connected to the internet, i.e. connected to the wired network. If the user is involved in some other activities, i.e. travelling or doing some offline job, which forces him/her to become disconnected from the internet, the information becomes unavailable. M-commerce removes such uncertainties. Wireless networking enables the user to be connected to the wireless internet even when on the move. This means that in m-commerce it is possible to stay online anywhere in the world and at any time of the day. The user can instantly access information with the help of the mobile device and the wireless network or the Internet, even when he/she is doing other activities such as travelling or shopping. This helps employees to make spontaneous decisions, customers to ask questions spontaneously, and business owners to conduct transactions at any time regardless of their geographic location.

**Q.7. Discuss the impact of 'Wireless Communication Technology' in Mobile Commerce.**

**Ans:** Mobile commerce is based on *wireless communication technology*. Wireless communication technology has emerged as the new choice of the modern corporate world. The wireless network has some distinct advantages over traditional wired networks, which use coaxial, twisted pair, or fibre optic cables to physically connect two or more computing devices. In wireless networks, data transmission between computers is facilitated by microwaves, radio waves, or infrared waves. It eliminates the cumbersome cabling process with bulky cables and significantly reduces labour and material costs as well as development time. The wireless network technology, together with the wireless application protocol, forms the backbone of mobile commerce applications. In various vertical markets such as retail, healthcare, manufacturing and warehousing, mobile commerce gained acceptance and increased productivity through the use of mobile devices. The mobile handheld devices are used to transmit data to centralized hosts in real time over wireless networks.

Mobile commerce, which uses wireless technology, offers some additional advantages over internet-based e-commerce. In *e-commerce*, the internet provides

information at any time of the day; in *m-commerce*; the information is available anytime, anywhere. In e-commerce, the information is available as long as the user is connected to the internet, i.e. connected to the wired network. If the user is involved in some other activities, i.e. travelling or doing some offline job, which forces him/her to become disconnected from the internet, the information becomes unavailable. M-commerce removes such uncertainties. Wireless networking enables the user to be connected to the wireless internet even when on the move. This means that in m-commerce it is possible to stay online anywhere in the world and at any time of the day. The user can instantly access information with the help of the mobile device and the wireless network or the Internet, even when he/she is doing other activities such as traveling or shopping. This helps employees to make spontaneous decisions, customers to ask questions spontaneously, and business owners to conduct transactions at any time regardless of their geographic location.

**Q.8. What are the major challenges of Mobile Commerce?**

**Ans:** The major challenges of mobile commerce are:

- Development of Mobile Devices
- Small Screen Size and Poor Resolution
- Low Speed Processor
- Small Storage Capacity
- Low Power Backup
- Payment Troubles

**Q.9. What is Mobile Payment? Compare it with Mobile Shopping.**

**Ans:** Mobile payment is a money payment made for a product or service through a mobile phone. Mobile payment technology can also be used to instantly send money to friends or family members. Digital wallets like- *Paytm*, *Google Pay*, etc. allow a customer to make payments without swiping a card or paying with physical cash.

*Mobile shopping* allows a customer to purchase a product online from a mobile device using an application such as *Amazon* or *Flipkart*.

**Q.10. What is 'e-Business'?**

**Ans:** E-Business (Electronic business) or online business means business transactions that take place online with the help of the internet. Here, the buyer and the seller don't meet personally.

The scope of e-business is limited to executing core business process of the organization. These processes would have external interface like- suppliers, customers, contractors, consultants and so on. The core business processes of the organization are- procurement, manufacturing, selling, distribution, delivery and accounting.

### **Long Answer Questions**

**Q.1. Define E-Commerce. Discuss some important features of e-Commerce.**

**Ans:** E-Commerce stands for 'Electronic Commerce'. It refers to buying and selling of goods, products, or services over the internet. E-Commerce is a methodology of modern business, which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery.

The term '*e-Commerce*' also comprises other activities including- online auctions, internet banking, payment gateways, and online ticketing.

Some popular e-Commerce platforms are: Shopify, Amazon, Flipkart, Myntra, IndiaMART, and Snapdeal.

#### **Features of E-Commerce:**

Some of the features of E-Commerce are as follows:

- **Cashless Payment:** E-Commerce allows the use of electronic payment. It allows the transaction from credit cards, debit cards, electronic fund transfer via bank's website, and other electronic payment methods.
- **24x7 Availability:** E-Commerce provides 24x7 service availability. It is available anywhere, anytime.
- **Improved Sales:** Using e-commerce, orders for the products can be generated anytime, anywhere without any human intervention. It gives a big boost to existing sales volumes.
- **Advertising and Marketing:** E-Commerce helps in good marketing management of products and services. It helps to increase the reach of advertising of products and services of businesses.
- **Support:** E-commerce provides various ways to provide pre-sales and post-sales assistance to provide better services to customers.

- **Improvement in Communication:** E-commerce gives faster, efficient and reliable communication with customers and partners.
- **Global Reach:** It enables a business to easily reach across geographic boundaries.

**Q.2. Compare and contrast 'Traditional Commerce' with 'E-Commerce'.**

*Or*

**Explain the difference between 'Traditional Commerce' and 'E-Commerce'.**

**Ans:** The following table depicts the difference between 'Traditional Commerce' and 'E-Commerce':

Traditional Commerce	E-Commerce
Traditional commerce refers to the commercial transactions or exchange of information, buying or selling product/services from person to person without use of internet.	E-commerce refers to the commercial transactions or exchange of information, buying or selling product/services electronically with the help of internet.
The start-up cost of traditional commerce is very high.	The start-up cost of e-commerce is low.
Traditional commerce is usually carried out by face to face.	E-commerce is carried out by screen to face.
In traditional commerce, processing of transaction is manual.	In e-commerce, processing of transaction is automatic.
In traditional commerce, delivery of products is instant.	In e-commerce, delivery of products takes time.
Its accessibility is for limited time in a day.	Its accessibility is 24 x 7. 24 x 7 means "24 hours a day, 7 days a week".
Traditional commerce is done where digital network is not reachable.	E-commerce is used to save valuable time and money.
Traditional commerce is an older method of business style which comes under traditional business.	E-commerce is a newer concept of business style which comes under e-business.
In traditional commerce, customers can inspect products physically before purchase.	In e-commerce, customers can not inspect products physically before purchase.
Communications of business depends upon individual skills.	In e-Commerce, there is no human intervention.

Q.3. Compare and contrast 'E-Commerce' with 'M-Commerce'.

Or

Explain the difference between 'Electronic Commerce' and 'Mobile Commerce'.

Ans: The following table depicts the difference between 'E-Commerce' and 'M-Commerce':

E-Commerce	M-Commerce
The process of buying and selling products or services over the internet by using personal computers or laptops is called as <i>E-commerce</i> . It refers to ' <i>Electronic commerce</i> '.	The process of buying and selling products or services over the internet by using wireless handheld devices (like- mobile phones or tablets) is called as <i>M-commerce</i> . It refers to ' <i>Mobile Commerce</i> '.
E-commerce activities are performed with the help of desktop computers and laptops.	M-commerce activities are performed with the help of mobile devices like- smartphones, tablets, PDA's (Personal Digital Assistant) etc.
E-commerce is an older concept developed in 1970's.	M-commerce is a newer concept developed in 1990's. It is actually a subset of e-commerce.
In e-commerce, the use of internet is mandatory.	In case of m-commerce, some activities can be performed without internet also. Like- Sending SMS to promote a product/service via. Mobile.
Its reachability is comparatively low than the m-commerce as it is not so good in portability.	Its reachability is more than that of e-commerce only due to the use of mobile devices.
In e-commerce, location tracking capabilities are limited due to the non-portability of devices.	In m-commerce, location tracking capabilities is so good as mobile apps track and identify user locations with the help of GPS technology, Wi-Fi, and so on.
E-commerce fails in push notification.	In m-commerce, push notification can be achieved.
Mobility is high. Users can make transactions everywhere as long as they are connected to the Internet.	Mobility is low. Users can make transactions on their computers and laptops with limited mobility.
M-commerce is available anyplace you go, even if there is no internet.	For E-commerce, you still need to go to a place where there is internet to access your online transactions.



Examples of E-commerce include: *Amazon, Flipkart, Quikr, OLX* websites.

Example of M-commerce include: mobile banking like- *Paytm*.

**Q.4. What are the different e-Commerce business models?**

*Or*

**Explain the different business models of e-Commerce with respect to customers and vendors.**

**Ans:** Nowadays e-commerce has become very popular among the people who want to buy and sell different things online.

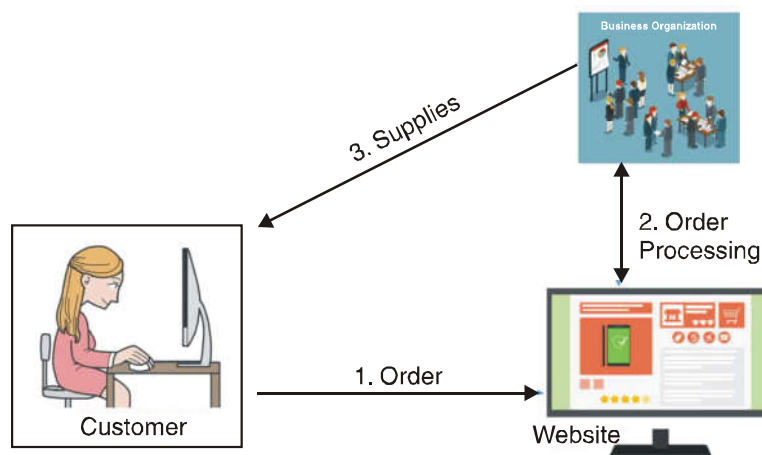
There are basically four main types of e-commerce models that can describe almost every transaction between **Consumers (C)** and **Businesses (B)**.

- (1) Business to Consumer (B2C)
- (2) Business to Business (B2B)
- (3) Consumer to Consumer (C2C)
- (4) Consumer to Business (C2B)

**(1) Business to Consumer (B2C)**

In **Business-to-Consumer (B2C)** e-commerce, the company will sell their goods and/or services directly to the consumer.

In this type of e-commerce, customers or consumers visit the company's website and look at products, pictures and read reviews there. Then they place their order and the company ships the goods directly to them.



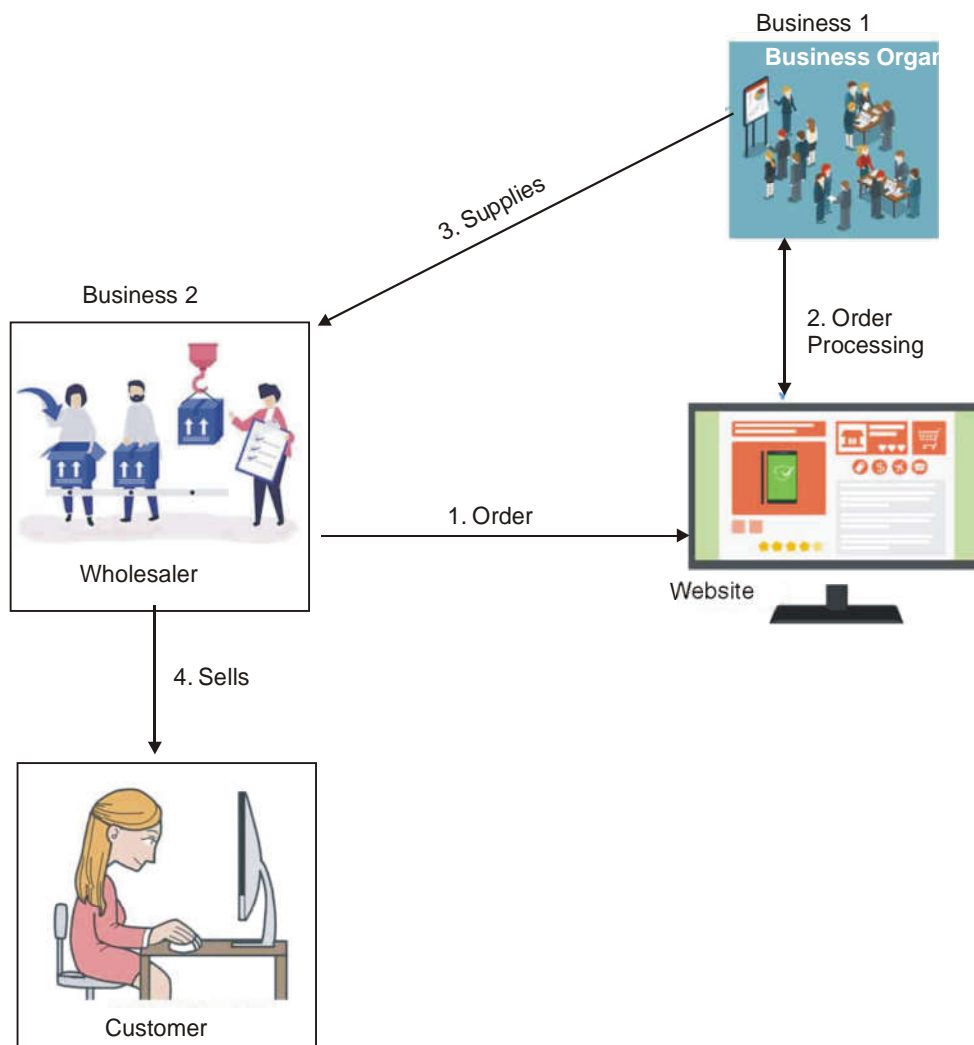
**(B2C E-Commerce Model)**

**Example:** An example of B2C e-commerce would be someone buying a pair of shoes online from **Amazon** or **eBay**.

## (2) Business to Business (B2B)

In **Business-to-Business (B2B)** e-commerce, the companies are doing business with each other. B2B takes place between two businesses where one business provides services to other business.

In this type of e-commerce, the final consumer is not involved. The online transactions only involve the manufacturers, wholesalers, retailers etc.

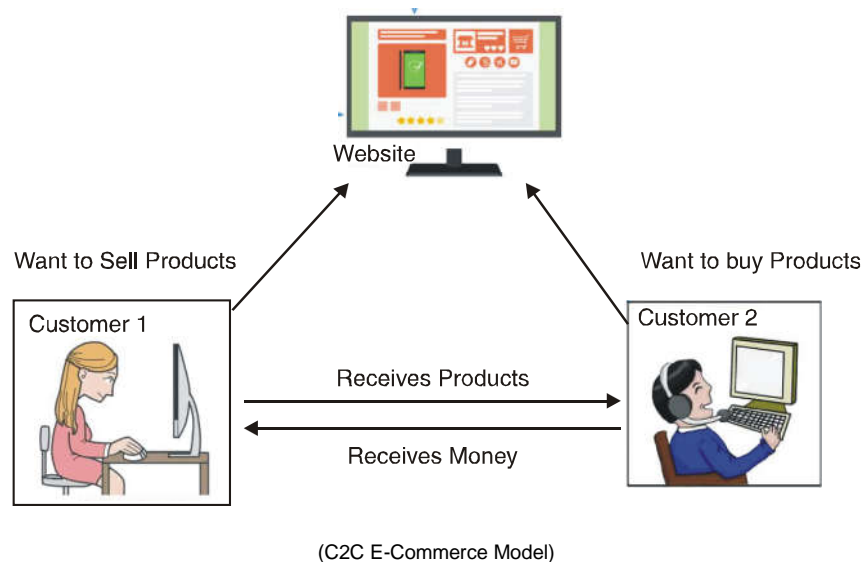


(B2B E-Commerce Model)

**Example:** A wholesaler places an order from a company's website (manufacturer) and after receiving the consignment, sells the end product to the final customer who comes to buy the product at one of its retail outlets.

### (3) Consumer to Consumer (C2C)

In **Consumer -to- Consumer (C2C)** e-commerce, the consumers are in direct contact with each other. No company is involved. It helps people sell their personal goods and assets directly to an interested party. C2C e-commerce takes place between two consumers where one consumer sells an item through an online auction while the other consumer purchases the item by offering the highest bid.

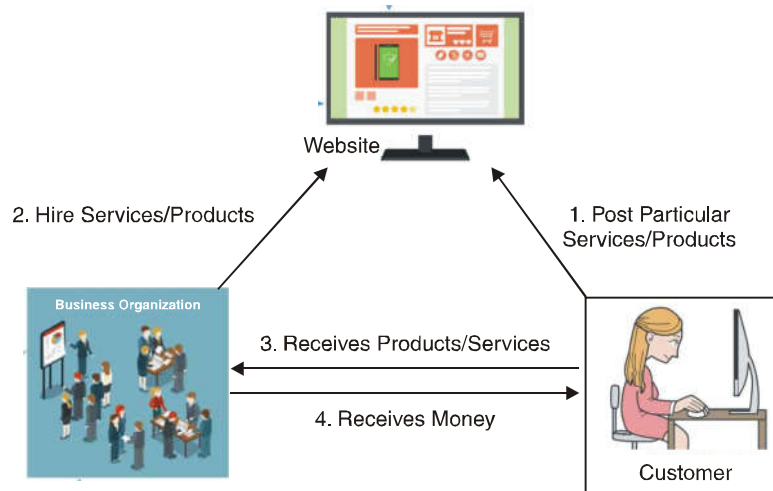


**Example:** CUSTOMER 1 wants to sell a car, so he/she can place his/her car on a website like- OLX or eBay, while the CUSTOMER 2 wants to buy that car. So, the CUSTOMER 2 can contact CUSTOMER 1 and buys the car from him/her.

### (4) Consumer to Business (C2B)

This is the reverse of B2C; it is a **Consumer to Business**.

In **Consumer -to- Business (C2B)** e-commerce, the consumer provides a good or some service to the company. In this business model, the consumer creates value, and the business consumes that value.



(C2B E-Commerce Model)

**Example:** A customer places some of their services or products on the website. If the services or products create value for the business organization, then they order these services or products, but in most cases, services. When the deal is done, they receive services or products, and the customer receives money.

**Note:** Freelancing websites like- **Fiverr, Freelancer** work on C2B business model.

**Q.5. What is Mobile Commerce? Discuss the scope of Mobile Commerce.**

**Ans:** Mobile commerce, also known as *m-commerce*, is defined as the process of conducting commercial transactions such as online banking, paying bills or making purchases using portable mobile devices like- *mobile phones or tablets* online.

You can't use your laptop or PC (Personal Computer) everywhere, but you can use your mobile phones easily. You can do online shopping while travelling, transfer money easily with the help of mobile phones. Thus, this wireless solution is very much helpful and rising day by day.

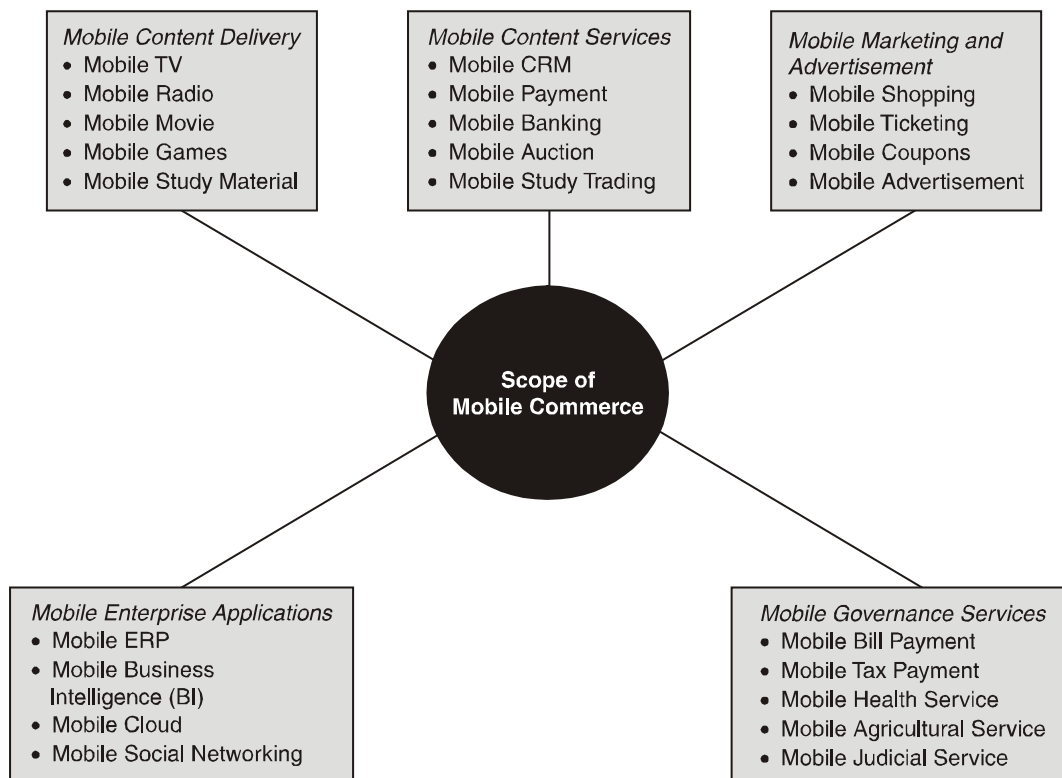
**Scope of Mobile Commerce:**

Mobile commerce provides instant connectivity between mobile users regardless of their geographic location or time of day. With the tremendous growth of wireless and mobile technology and the rapid production of cell phones in developing countries around the world, the scope of m-commerce has expanded many times over. With the advent of super-fast 4G access technology, which ensures high-speed data transmission rates in the order of 50Mbps, m-commerce opens up new perspectives for digital media applications. So, it is now possible for mobile users to

watch their favorite TV programmes or download and view famous movies in their mobile devices while travelling.

Downloading MP3 music, playing online games or participating in live video conferencing while in transit have become a reality now. Apart from such audio/video applications, SMS-based text messaging is widely accepted in day-to-day business transactions. Whether to display product promos, to announce new product launches or to give attractive discounts, SMS have become an effective tool for mobile marketing. SMS-based advertisements have become an integral part of m-commerce. The role that SMS play in giving instant support to customers in the event of any kind of product failures or delivery delays cannot be ignored or downplayed.

Another major application area of m-commerce is in the field of *micro payments*. Mobile devices will replace users' debit/credit cards in the near future. The mobile phone replaces the money in your pocket and offers an affordable, low-risk alternative to credit / debit cards to pay anytime, anywhere and for anything.



(Scope of Mobile Commerce)

In SMS-based transactional payments, the mobile phone is used to send a PIN (Personal Identification Number) to a bank for authorization purpose. After the successful verification of the PIN by the bank, the user sends a payment request through an SMS from his/her mobile to the bank. The payment is done through an account transfer by the bank and both the payer and payee get an SMS from the bank regarding the successful completion of the payment. Thus, a completely cash less payment is made using the mobile phone within 10 to 15 seconds.

Mobile Commerce offers a range of location-based services, such as tracking and monitoring people / vehicles, identifying or finding the nearest ATMs / banks / hospitals/ restaurants and local weather / traffic reports.

*People tracking* can help in criminal investigation where the mobile phone used by a criminal can be tracked and its location is identified.

*Vehicle tracking* is used to determine the actual position of the goods to be delivered and helps in supply chain operation management.

The local traffic and weather report can be created in a local office and delivered to a user's mobile phone if desired. The local bank / ATM / hospital / restaurant information can also be delivered to a mobile user at minimal cost.

The scope of mobile commerce is ubiquitous, gradually covering all aspects of the lives of modern citizens. From mobile banking, mobile browsing and mobile ticketing to mobile marketing, mobile advertising and mobile computing, mobile commerce is gradually becoming an integral part of both the corporate world and the common people.

With the prices of mobile phone decreasing exponentially and the number of different mobile applications increasing enormously, more and more people will indulge in m-commerce applications and soon it will become the preferred choice of the digital business world.

**Q.6. Write down the major benefits of Mobile Commerce.**

**Ans:** The main advantage of mobile commerce is that it gives the mobile users instant connectivity regardless of their geographic location and time of the day. The mobile user can stay connected to his/her company network and collect information, even when he/she is in transit and remotely located away from the company installation. The same light weight mobile device can be used for making business transactions or making online payments **24 x 7** in a cost-effective way.

The major benefits of mobile commerce are as follows:

- **Anytime - Anywhere**

Mobile commerce together with wireless communication technology and wireless broadband internet access, keeps the mobile user connected with the internet while travelling across the globe. The business information is available to the mobile user any time of the day and anywhere around the globe. This anytime/anywhere internet access makes business transactions more flexible and customer communications more efficient, which in turn improves the productivity of the company and increases customer satisfaction. The valuable market information, stock/share prices, inventory position, delivery schedule, etc. are instantly available at the fingertips. The round the clock (24 X 7) internet availability benefits many users to conduct business transactions from their homes or from any other place while on the move and at any convenient time. Thus m-commerce offers greater mobility and flexibility to mobile users in performing business transactions using their handheld mobile devices.

- **Good Business Opportunities**

The number of mobile users is increasing day by day, so through M-Commerce your business gets large and growing market place for a variety of goods and services.

- **Good Marketing Tool**

M-commerce also helps businesses target customers according to their location, service provider, the type of device they use and various other criteria. This can be a good marketing tool.

- **Process Multiple Orders**

Mobile commerce allows businesses to process multiple orders at once. There are no long checkout lines, and customers can buy products at any time.

- **Cost-effective**

The costs of transactions using mobile devices are relatively low. The critical business data, such as reports, photographs, etc. can be captured and transmitted easily from the mobile devices without involving any bulky expensive equipment. The customer queries can be attended and support provided instantly from the mobile device, thus making customer support more comprehensive. The SMS-based micro payments facilitate bank account transfer

within a few seconds and at the cost of an SMS. In case of mobile billing, users can pay for electricity bills, telephone bills, petrol, grocery, etc. through their mobile phones. The payments made in the mobile phones for such items will appear as part of their mobile phone bills, thus eliminating the need for a third party payment mechanism such as, credit cards. This reduces the cost of payment to a large extent.

- **Personalized Service**

Mobile commerce offers a number of personalized services to the mobile users depending on their various requirements and purposes. The digital cellular technology can monitor the location of user performing mobile transactions. Knowledge of the user's location may be used to deliver timely and useful contents such as product availability and discount information to the potential customer. Timely information, such as flight schedules and flight availability can be delivered to the user at the last minute. Delivery of time critical as well as emergency information, SMS-based notifications and alerts can be easily made if the location of the user is tracked. The location tracking is also utilized in offering customized services to the user, such as delivery of discount coupons that can be cashed in and around of the location of the customer. Delivery of regional maps, driving directions and online directories are also possible if the location of the mobile user is known. Another major advantage of location tracking is that, in criminal investigation, the location of the mobile user can be monitored and recorded as part of the investigation process.

- **Savings**

Companies try to reach to the consumer directly through M-Commerce, so users have no need to go far to the store physically and at the end it saves user's time and money.

**Q.7. Discuss the major limitations of Mobile Commerce.**

**Ans:** Although mobile commerce has some distinctive advantages, such as instant connectivity and location and time independence over electronic commerce and offers low cost personalized services to the mobile users, it suffers from some serious limitations which restrict its use in mainstream business world. The mobile device limitations, such as small screen size, small memory capacity and lower processor speed makes it unsuitable for high quality internet graphics applications. The limited availability of bandwidth to various mobile operators imposes a limitation on the



speed of operation of different mobile commerce applications. The wireless networks used in mobile commerce are more vulnerable to external hacker attacks compared to wired networks and stringent security arrangements in the form of encryption and authentication should be adopted to prevent unwanted intrusions.

The main limitations of mobile commerce are explained in detail below:

### **(1) Mobile Device Limitations**

- **Small Screen Size and Poor Resolution**

Mobile devices have smaller screen size and poor resolution which makes them inconvenient for browsing applications. Data entry can be quite difficult using small combinational keypad that comes with most of the mobile hand held devices. The wide and high resolution screens in conventional desktops or laptops used in e-commerce applications offer ease of use in data entry operations as well as viewing web pages. These larger screens support 1920 X 1080 resolution and 3D graphics display. Although mobile devices offer greater mobility and flexibility in accessing information, the smaller screen size restricts the amount of information that could be presented and offers a less convenient user interface in the form of menu-based scroll-and-click mode of data entry.

- **Small Storage Capacity**

The mobile devices do not have large storage space. The storage capacity in mobile devices is in the order of 32GB to 128 GB compared to 2TB or higher used in desktops/laptops. So, it is difficult to store large video files in mobile devices for future use. The mobile application developers must be concerned about the size of their applications during the development phase.

- **Low Speed Processor**

Most mobile devices are equipped with low-powered processors with a much slower processing speed compared to the more sophisticated processors used in desktops or laptops. Such low speed processors limit the download speed in most mobile commerce applications. The applications requiring too much processing power should be avoided as they may become irritably slow due to low speed processors. Also, keeping the low processor speed in mind, the mobile websites must be optimized to ensure customer satisfaction. Unnecessary plug-ins, flash images and animations **should** be removed to ensure speed of delivery.

- **Low Power Backup**

Mobile devices use batteries as their power supply. Normally, power for a mobile device lasts up to 2-3 days, depending on the size of the device. After this time, the battery should be recharged, which puts additional strain on the user, who has to remember to recharge it from time to time.

## **(2) Wireless Network Limitations**

Mobile commerce depends on wireless networks, which are typically slower than wired networks. In many cases, wireless networks offer one fourth speed of standard wired network. Also, most wireless networks are more common in urban areas and some of the rural areas might not have wireless communication facilities. So online mobile services may become unavailable in some rural areas, and thus the popularity of mobile services may be suffered. Unless the mobile device is compatible with 3G or 4G technology, the applications become sluggish and unreliable compared to wired network applications. Atmospheric disturbances and the fading of signals transmitted over wireless networks sometimes cause serious data errors and can even lead to disconnections.

## **(3) Bandwidth Restrictions**

A major disadvantage of mobile commerce is the bandwidth limitation, which imposes a limitation on speed of operation in various m-commerce applications. Wireless networks use frequency spectrum to transmit information across the network. Regulatory bodies control the use of available frequency spectrum and allocate the spectrum to various mobile operators. In India, the frequency spectrum were initially allocated and regulated by Department of Telecommunication (DOT). Later, the Telecom Regulatory Authority of India (TRAI) was set up to control the usage of frequency spectrum. The limited availability of bandwidth to various mobile operators in turn restricts the data rate in mobile commerce applications.

## **(4) Security Issues**

Another concern that is often raised in connection with mobile commerce is the security issue. Mobile devices are more vulnerable to theft, loss and mishandling. Special care must be taken to ensure that the security and privacy of the mobile phone customer are not compromised if a mobile device is lost. This includes that sensitive information is not stored on the mobile devices and that the PIN / password can be changed / blocked quickly and easily if necessary.

Mobile commerce employs public wireless networks for transmission of signals which can be easily intercepted by hackers for capturing/altering stream of data travelling through the wireless medium. In wired networks, in order to gain access, the intruder has to gain physical access to the wired infrastructure. In wireless networks, anyone with the ability to receive signal in a mobile device can gain access to the network. In order to protect the wireless network from unwanted users, various encryption and authentication techniques should be employed.

Authentication of mobile devices prior to carrying out any financial transaction is another important issue. The *Subscriber Identity Module (SIM)* stores the subscriber identity in the form of cryptographic keys. The authentication server of the wireless network stores the matching keys and verifies the user identity prior to any transaction. While it is much easier to intercept signals over wireless networks, the encryption and authentication mechanism makes it difficult for the unwanted user to decrypt.

**Q.8. Explain the Mobile Commerce Framework in detail.**

**Ans:** As m-commerce provides mobility for busy professionals, more and more people are tending to access the Internet on their mobile phones. The day-to-day functioning of individuals as well as business corporations is being transformed to mobile applications and is embedded in mobile devices. The mobile network operators have started providing *Value-Added Services (VAS)* that supports the new concepts of anytime anywhere computing. Accordingly, a new mobile business model has emerged that is based on a joint distribution of sales through sales in the respective channels. In mobile retail, for example, diverse mobile applications are being developed that enable the multi-channel retailer to carry out key functions such as mobile promotions, mobile payment, product information display, order management, catalogue management, create and display shopping lists, loyalty programs and other value-added services. Similarly, in the travel industry, location-based tourism, mobile ticketing, navigation guidance and the provision of local weather and traffic information lead to new opportunities for generating sales. In order to make these value-added services work efficiently, and in a cost-effective manner, perfect collaboration between various network providers, technology providers and application developers is required. In order to integrate different mobile services, applications and technologies in a well-coordinated and controlled architecture, a mobile commerce framework needs to be developed. The purpose of the framework is to develop a structured integration of mobile services, applications



**(II) Technology Infrastructure**

This component deals with the distribution of digital contents and transaction details over wireless communication networks to customer locations or other business installations. The wireless network infrastructure forms the basis of the mobile commerce framework as it fulfils the basic requirements of data transmission between different business partners when carrying out any business transaction.

The technology infrastructure includes wireless communication technology, Wireless Application Protocol (WAP) and mobile security technology. These technologies need to support digital content distribution, mobile application development and distribution and also provide a secure technological platform for mobile billing and prepaid services through the use of mobile Virtual Private Networks (VPN).

**(III) Application Development**

The application development component of mobile commerce framework deals with the diverse range of mobile commerce applications. The main purpose of these mobile applications is to make the product information available to the end users and also to enable them to conduct mobile business transactions. There are four main categories of mobile applications, namely information applications, communication applications, entertainment applications, and commerce applications. Several mobile applications, such as mobile ticketing, mobile banking, mobile advertising, mobile office applications, etc. fall under these categories. These applications support important business functionalities in the respective industries and are intended to generate higher sales and reduce costs. Sometimes multiple applications are combined to provide an aggregated service, resulting in a further cost reduction. With the rapid development of various emerging mobile technologies, application development is going through an evolutionary stage. In order to meet the requirements of today's rapidly evolving markets, the mobile applications must be developed in an innovative manner so that it allows the service provider to quickly address the growing demands of the market and also at the same time offer more profitability and greater cost reduction.

**(IV) Business Service Infrastructure**

The business service infrastructure forms the backbone of the mobile commerce framework. It supports the back office functions such as payment services, location and search functions as well as security measures of the mobile commerce systems. The production and fulfilment of these services are beyond the capabilities of

traditional telecommunications service providers. These services are managed and provided by some third party providers who have the ability and experience to provide such functions. They maintain the necessary infrastructure to support secure financial transactions in mobile commerce environments and also provide back-end support for search and other facilities. Such back office systems should be flexible enough and also be able to provide new services quickly. They have a direct impact on the end-user experience and have the greatest impact on the success or failure of the service provider. With the help of such back office infrastructures, mobile service providers can avoid upfront investments in IT, and these managed services also offer service providers the opportunity to switch quickly to the newer technological environment without significant investments.

Above four components are the four pillars of mobile commerce framework and all-commerce activities revolve around them. Whenever a mobile user tends to download MP3 music or a latest movie in his/her mobile device, sends an SMS requesting online payment to a bank, submits online order form requesting purchase in a mobile browser or books a mobile airline ticket, he/she is indulging in either or all four of the above mobile commerce framework components. In order to cope with the dynamic nature of the modern day lifestyle, people are demanding more mobility in accessing their business applications. A properly integrated and well-coordinated mobile commerce framework needs to be developed in order to provide easy-to-use and secure mobile services to end customers. The main purpose of a structured and balanced mobile commerce framework is to enable businesses to adapt quickly to the latest mobile technologies and ensure customer loyalty by providing them improved and enhanced services in sync with the growing market demands.

**Q.9. Write about M-Commerce Business Models.**

*Or*

**Explain Mobile Commerce Business Models in detail.**

**Ans:** A business model determines the path or process through which a business organization can achieve some profit. It shows how an organization can make an investment, add some value to the investment, get a finished product or service, and generate income by selling the product or service. The income generated from the sale must exceed the operating costs for the company to make a profit. Business models specify the mechanism for generating profit margins and maintaining them in the value chain. Thus, business models help managers with the strategic planning

and formulation of the entire business strategy of the organization. E-commerce has some traditional business models that are widely used by all of the major e-commerce providers around the world. These include the dealer model, broker model, service provider model, advertiser model, etc. Mobile commerce business models differ from electronic commerce because of their fundamental differences in operation and technology. Since mobile commerce gives users additional mobility, the business models also reflect the nature of mobility. The four most important services of mobile commerce are payment services, mobile advertising, mobile shopping and mobile entertainment. Accordingly, the business models of mobile commerce also revolve around these four applications.

The four major mobile commerce business models are described below:

### **(1) Payment Model**

In this model, mobile payment service providers offer mobile payment services that enable users to conduct cashless payment transactions including bank transactions, stock trading, tax / bill payments, and ticket or other retail purchases using a credit / debit card or bank PIN. The payment service providers work with banks (or other financial institutions) and / or mobile network operators and accordingly receive a bank-controlled mobile payment model or an operator-controlled mobile payment model. The payment service provider charges a certain percentage fee for each payment transaction made using the payment application. Alternatively, the user can pay a nominal monthly subscription fee to the payment service provider and can use the service as and when required.

### **(2) Advertiser Model**

This model is an extension of traditional e-commerce advertiser model and provides mobile websites that can be viewed by mobile users on their portable mobile devices. Advertising companies can display their advertising messages on the website and pay a rental fee to the hosting website for displaying their messages. These mobile advertising websites usually offer users some basic services such as email services, search engines, news services or social networking services, and publish promotional messages on these websites for wider reach. The advertisements often come with purchase buttons that allow users to purchase the product directly from their mobile devices. The mobile payment service is also provided to facilitate mobile purchase directly from the advertising websites. The advertising companies pay a fixed fee to the advertising website for the presentation of their advertising messages.

Additional revenue is generated for every purchase transaction the user makes through the website

### **(3) Shopping Model**

This model is similar to the e-commerce retailer model, in which retailers create mobile websites to display their range of products on customers' mobile devices. The mobile users can browse the mobile websites on their WAP enabled mobile screens and select and purchase any product of their choice. Mobile payment option is also provided in the website so that the users can make mobile payment for the purchased product and complete the deal even while in transit or far away from the actual store location. Thus, shopping model allows retailers to generate additional revenues through mobile shopping and can improve their profit margins.

### **(4) Content Provider Model**

In this model, mobile service providers offer a variety of entertainment content such as breaking news, weather forecast, traffic information, music, mobile games, TV shows, video content, movies, etc., which can be downloaded to users' mobile devices. Network operators are connected to various content providers and offer mobile customers both subscription-based services and pay-per-use services. Location-based services, such as map-based navigational services, discount coupons offered in local retail stores or restaurants, news of local events, etc. are also delivered in customer mobile devices. The revenue is generated through subscription fees (for news, traffic/weather updates, movies, and games), usage fees (TV shows, videos, games etc.) or data download fees (for e-mails, e-books, etc.). Various media houses, press agencies or content aggregators follow this model in order to generate additional income via the mobile channel.

#### **Q.10. What is the impact of M-Commerce?**

**Ans:** In general, mobile commerce is viewed as an extension of traditional internet-based e-commerce. However, because the number of mobile device owners is far larger than that of internet users, mobile commerce has a huge impact on the daily activities of both customers and business owners.

By providing instant internet connectivity and greater mobility to billions of mobile users, m-commerce is redefining the relationship between customers and providers of goods and services. It is predicted that in the near future mobile commerce will significantly influence the marketing orientation of almost all major industrial sectors and thus change the general market dynamics.



In addition to providing mobility and location tracking for users, m-commerce applications are able to achieve a high level of personalization and offer interaction with the individual customer. In a highly interactive environment, personal profiles, product preferences, home and office locations, payment details, etc. can be captured directly from the customer's mobile devices to create an accurate and personalized database. Conversational advertising can be delivered directly to the mobile phone from a brand to describe the benefits of the product. This is an emerging concept where the mobile user can sign up to receive product information from a brand by providing the company with the mobile phone number. By using the location tracking of M-Commerce, special customer zones can be created, which are identified by specific customers with different product preferences. The customers of a zone can be dynamically informed about various discounts and offers in the local shops. Knowledge of customer numbers and preferences in a zone will help the suppliers to estimate the demand for a particular product, and also let the customers be informed instantly about any discounts/price reduction offered in nearby stores.

The popularity of mobile entertainment is growing rapidly. These include mobile phone gambling, mobile collaborative games, mobile sport video and mobile television. With the rapid development of sophisticated mobile applications, the mobile game business is growing rapidly. Developments in technologies such as mobile video sequencing, mobile video transcoding and mobile video communication play a key role in the success factor of the mobile entertainment industry.

Similarly, in healthcare, mobile medical imaging is enabled through the use of a 3G/4G wireless network. In the education industry, mobile learning is being introduced in the form of SMS or text messages. With the help of mobile learning or M-learning, people can save their time, energy and money, they can learn at home, office, and even during travelling.

With the introduction of newer display technologies, such as electronic paper, liquid crystal display and digital paper, the mobile electronic readers or e-books have become commonplace. A large number of mobile users have started carrying e-readers to download online books or online newspapers while travelling.

The impact of m-commerce is universal and constantly expanding. With the cost of mobile devices going down and introduction of newer and powerful technologies, more and more people are indulging in numerous mobile applications and eventually m-commerce is becoming the preferred tool for conducting business transactions on the go.

## **EXERCISE**

1. What is Mobile Commerce? Describe how business transactions are performed through mobile devices.
2. Discuss the benefits and limitations of mobile commerce.
3. Explain the various categories of mobile payment.
4. List the advantages of e-Commerce to business.
5. Discuss the benefits of m-Commerce to customers.
6. List the devices commonly used for mobile commerce.
7. What is the future of mobile commerce in India? Comment.
8. What are the various categories of mobile payment? Describe card-based mobile payment.