CHAPTER -III
3.1. INTRODUCTION

E-commerce is a technology-mediated exchange between parties (individuals or organizations) as well as the electronically based intra-or inter-organizational activities that facilitate such exchanges. It is the business option in which the transactions take place via telecommunications networks. It changes the way one can shop, learn, interact and transact business; this wave of emerging technology affects every facet of lifestyle, home as well as workplace.

E-commerce is directly or indirectly applicable in all areas of our life be it banking, entertainment, on line order processing cycle or SCM (Supply Chain Management). Owing to its wide variety of applications e-commerce has gained a lot of popularity over the decade. It has drawn the attention of researchers regarding the new technologies and resolving the security issues regarding the electronic transactions. E-commerce has been defined broadly as the business transactions of business over the web.

MEANING OF E-COMMERCE

E-commerce, or electronic commerce is an emerging concept that describes the process of buying and selling or exchanging of products, services and information via computer network including the Internet. It includes all inter-company and intra-company functions (such as marketing, finance, manufacturing, selling, and negotiation) that enable commerce and use electronic mail, EDI, file transfer, fax, video conferencing, workflow, or interaction with a remote computer the growth and expansion of interest and information technology have facilitated the emergence of E-Commerce. 
E-commerce or electronic commerce is defined as "the conducting of business communication and transactions over networks and through computers".

DEFINITIONS

The concept of e-commerce is spanned across various dimensions. Hence, different school of thought gave different definitions with different perspectives. Some defined it from business perspective and some defined with service perspective.

E-commerce can be defined from various perspectives as:

Communications perspective:

From a communication perspective, e-commerce is the delivery of goods, services, information or payments over computer networks, telephone lines or any other electronic means.

Business perspective:

From a business perspective, e-commerce is the application of technology toward the automation of business transactions.

Service perspective:

From a service perspective, e-commerce is a tool that addresses the desire of firms, consumers and management to cut service costs while improving the quality of goods and increasing speed of service delivery.

Commercial (trading) perspective:

From a commercial perspective, e-commerce provides the capability of buying and selling products, services and information on the Internet and via other online services.
Learning perspective:
From a learning perspective, e-commerce is an enabler of online training and education in schools, universities, and other organizations.

Collaborative perspective:
From a collaborative perspective, e-commerce is the framework of inter- and intra-organizational collaboration.

Community perspective:
From a community perspective, e-commerce provides a gathering place for community members to learn, transact, and collaborate.

3.2 COMPARISION BETWEEN TRADITIONAL AND ELECTRONIC COMMERCE

Traditional and electronic commerce can be compared on the basis of these three dimensions:

1. Product
The products and services provided by e-commerce are considered in this dimension. Product may be either physical or digital.

➢ In traditional commerce all products are physical.
➢ In pure e-commerce all products are digital.
➢ In partial e-commerce products include a mix of digital and physical dimensions.

2. Process
This dimension includes various processes involved in commercial transactions. Process may be either physical or digital.

➢ In traditional commerce all processes are physical.
➢ In pure e-commerce all processes are digital.
➢ In partial e-commerce processes include a mix of digital and physical dimensions.
3. Delivery agent

This dimension includes various intermediary units involved in commercial transactions. Usually delivery agents behave as a communication channel between buyer and seller.

Delivery agents may be either physical or digital.

- In traditional commerce all delivery agents are physical.
- In pure e-commerce all delivery agents are digital.
- In partial e-commerce delivery agents include a mix of digital and physical dimensions.

3.3 ADVANTAGES AND DISADVANTAGES OF E-COMMERCE

Advantages of E-commerce

The advantages of E-commerce are basically increased sales and decreased costs through the use of electronically media, especially the Web.

Major advantages of e-commerce are:

(i) Reduce Production Cost

It replaces paper-based business operations

(ii) Better Information System

It enables faster data retrieval rate

(iii) Better Management System within organization

Central database for different departments of the company

(iv) Better Management System across different organizations

Data exchanges and transactions between different organizations from suppliers to customers

(v) Better Business Strategy

Extending the business to cover more customers
(vi) Globalization

E-Commerce is the essential pathway to implement globalization.

The advantages of E-commerce can be divided into the benefits it provides to organizations, consumers, and society.

Advantages to Organizations

Due to the global reach of the Internet, businesses organizations are able to send messages worldwide exploring new markets and opportunities. This breaks down geographic limitations and reaches narrow markets that traditional businesses have difficulties accessing. Through the Internet, business now offers a wide range of choices and higher levels of customer information and details for individuals to search and compare. Some companies even provide a competitive advantage by inexpensive customization of products and services.

COST REDUCTION DEVICE

In terms of cost reduction, E-commerce helps organizations decrease costs in creating, processing, distributing, storing and retrieving information. For example, the communication and advertising costs could be lower by sending e-mails and using online advertising channels, than by using television commercials or the print media. In terms of online ordering and online auction organizations, the costs could be lower than running an actual shop with the associated manpower.

EXTENDED TRADING HOUR

Extended trading hours is another benefit, the 24 hours a day. 7 days a week in 365 days allows business always free to open on the Internet without overtime and extra cost.
OTHERS

Other advantages includes the up-to-date company material, current inventories, improved customers service, better customers communication, increased operating and trading flexibility.

Advantages to Consumers

For customers, the advantages occur in the buying process, product research, evaluation and execution. E-commerce provides customers with a platform to search product information through global markets with a wider range of choices, which makes comparison and evaluation easier and more efficient. With the ubiquity in accessing the Internet, consumers are able to search for shops or perform other transactions anytime in almost all locations. Cheaper goods and services is one of the benefits for consumers who purchase online. Furthermore, delivery time and costs can be saved by buyers when they purchase digital goods and services. Examples are e-books, music and audio clips, software, games, and distance education delivered via the Internet

Advantages to Society

By telecommuting, individuals can nowadays work and do their purchasing at home rather than by travelling around. This will result in less traffic and air through pollution. For people in Third World countries, many service and products are now available which were unavailable in the past; opportunities and higher education services are more achievable for students. Non-profit organizations, including government services, also benefit from E-commerce by the online payment system which supports the payment of tax refunds and pensions quickly and securely. Public services such as health care, education, and public social service also benefit from E-commerce. For example, rural doctors and nurses can access professional information and the latest health care technologies. Overall, e-commerce makes products and services more easily available without geographic limitations.
Disadvantages of E-commerce

The main disadvantage of E-commerce is the lack of a business model, lack of trust and key public infrastructure, slow navigation on the Internet, the high risk of buying unsatisfactory products, and most of all lack of security.

The limitations of e-commerce can be classified as technological and non-technological.

Technological limitations of EC

For the E-commerce system itself, there is no universally accepted standard for quality, security and reliability. The software of e-commerce development tools are always evolving, and have difficulties in integrating the Internet and E-commerce software with parts of the existing applications and databases.

For general users of e-commerce, the accessibility to Internet, such as Digital Divide, is unstable, expensive and insufficient in particular areas. This will generate limitations for business in accessing wider markets. Another problem is that if a business system's scalability is not sufficient and upgradeable, it will result in degradation, slowdown, and eventually loss of customers.

Non-Technological limitations of EC

The lack of trust is one main reasons why customers are unwilling to accept E-commerce due to privacy and security concerns. Some C2C action organizations are under an unencrypted payment environment, in which a customers' number might be stolen in the payment process. However, recent payment systems can solve this kind of problem. The danger of hackers accessing customer files and corrupting accounts is also related to privacy and legal issues.

For some customers, it is hard to change their habit of viewing merchandise in online; those customers resist traditional ways of purchasing physical goods in actual shops and have difficulties in changing from a real to a virtual store.
Another drawback is that there are some products that people will not buy online. For some high-cost and unique item businesses such as those involved with jewelry or antiques which have difficulties in offering the items in the e-commerce made in the same way as online books and CD sales. Another example is furniture companies: many of them have websites that allow customers to browse, but most customers still want to feel and touch the item before they make a decision. Different expectations of goods and services from customers are typical of the online purchasing environment. An example is in the perception of colour. Owing to different monitor settings, inaccurate information about colour makes it difficult for the customers to make an accurate decision when purchasing is made in online. Because customers are unable to trial or access the actual goods before purchasing and delivery, many customers will not take the risk of purchasing through the Internet.

3.4 E-Banking

E-Banking, Electronic Banking, Internet Banking (or) Online Banking relates to a variety of Banking business conducted in online. They include banking service providers selling services to customers. All the banking business transactions are done through the internet. Online Banking is important because it offers customers convenience that has never before been available. The technology is now available allows customers to withdraw money on the internet by using ATM, 24 hours a day and 7 days a week without having to go to banks.

E-Banking is a term used for performing transactions payments etc, over the internet through a Bank credit union or building societies under secured website.
Online shopping is important because it offers buyers convenience that has never before been achievable. The technology that is now available allows customers to shop on the internet 24 hours a day and seven days a week, without having to leave their homes or offices. Shoppers are provided with an abundance of merchant sites where almost any goods on earth can be bought. Consumers can also compare prices from a variety of different retailers with greater ease, compared to them physically going to shopping centres to check prices.

The most important feature of any shopping system is the payment system. Our traditional payment system had many problems. Some of them are listed below:

PROBLEMS WITH THE TRADITIONAL PAYMENT SYSTEMS

There are many problems with the traditional payment systems that are leading to its fade out. Some of them are enumerated below:

Lack of Convenience

Traditional payment systems require the consumer to either send paper cheques by snail-mail or require him/her to physically come over and sign papers before performing a transaction. This may lead to annoying circumstances sometimes.

Lack of Security

This is because the consumer has to send all confidential data on a paper, which is not encrypted, that too by post where it may be read by anyone.
Lack of Coverage

When we talk in terms of current businesses, they span many countries or states. These business houses need faster transactions everywhere. This is not possible without the bank having branch near all of the company offices. This statement is self-explanatory.

Lack of Eligibility

Not all potential buyers may have a bank account.

Lack of Support for Micro-transactions

Many transactions done on the Internet are of very low cost though they involve data flow between two entities in two countries. The same if done on paper may not be feasible at all.

To overcome the problems of drawbacks of traditional payment systems several new electronic payment systems are developed like e-Cash, e-Cheques, credit cards, smarts cards etc.

3.5 ONLINE PAYMENTS

For online shopping, almost everyone loves the convenience of online payments rather than the burdensome task of mailing funds for a purchase. As a business owner, one can experience a huge decrease in the time it takes to get your funds into your hands.

In order for payment processing to work successfully, multiple entities have to be working in a co-ordinated or compatible system. Here are some of the entities involved:

Customer gateway
Bank clearinghouse
Merchant
ONLINE BAKING

Online banking (or Internet banking) is a term used for performing transactions, payments etc. over the Internet through a bank, credit union or building society's under secured website. This allows customers to do their banking outside of bank hours and from anywhere where Internet access facility is available. In most cases a web browser is utilized and any normal internet connection is suitable. No special software or hardware is usually needed.

Online banking usually offers such features as:

➤ Electronic bill payment
➤ Funds transfer between a customer's own checking and savings accounts, or to another customer's account
➤ Investment purchase or sale
➤ Loan applications and transactions, such as repayments
➤ Account aggregation to allow the customers to monitor all of their accounts in one place whether they are with their main bank or with other institutions.
➤ There is a growing number of banks that operate exclusively in online. Because these online banks have low costs compared to traditional banks they can offer high interest rates.

Through online banking, different branches of a bank can be interconnected. This feature is known as CBS.

Core Banking Solution (CBS)

Core Banking Solution (CBS) is the networking of branches, which enables Customers to operate their accounts, and avail banking services from any branch of the Bank on CBS network, regardless of where the account is maintained. The customer is no more the customer of a Branch. One becomes the Bank's Customer.
Thus CBS is a step towards enhancing customer convenience through Anywhere and Anytime Banking.

Advantages of CBS All CBS branches are inter-connected with each other. Therefore, Customers of CBS branches can avail various banking facilities from any other CBS branch located anywhere in the world. These services are:

- To make enquiries about the balance; debit or credit entries in the account.
- To obtain cash payment out of his account by tendering a cheque.
- To deposit a cheque for credit into his account.
- To deposit cash into the account.
- To deposit cheques / cash into account of some other person who has account in a CBS branch.
- To get statement of account.
- To transfer funds from his account to some other account ones own or of third party, provided both accounts are in CBS branches.
- To obtain Demand Drafts or Banker's Cheques from any branch on CBS - amount shall be online debited to his account.
- Customers can continue to use ATMs and other Delivery Channels, which are also interfaced with CBS platform. Similarly, facilities like Bill Payment, I-Bob, M-bob etc. shall also continue to be available. Bank is in the process of launching Internet-banking facility shortly.

All these aim to provide convenient, efficient, and high quality banking experience to the customers, comparable to world-class standards.
CBS provides some other benefits also. These are:

**Implements the quality and efficiency of the services**

A CBS branch is like a Sales & Service Delivery Centre. Back office processes/activities are handled through technology at some other site, called Data Center. Branch, therefore, has more time for serving customers. This improves the quality and efficiency of the services rendered and the customer is directly benefited by way of satisfying and happy banking experience.

**Provides convenient and delightful banking**

Since a CBS branch is essentially designed to focus on customer-interface and customer service, the special lay-out and ambience of the branch is made to provide a convenient and delightful banking experience. The Customer Service Representatives / Executives at the branch are specially trained to understand, facilitate and deliver banking services efficiently and effectively.

### 3.6 TYPES OF ELECTRONIC PAYMENT SYSTEMS

There are various kind of payment systems available for the electronic transaction like electronic tokens, e-cash, e-cheques. Now let's discuss these systems and associated issues in detail:

#### 3.6.1. Electronic Tokens

An electronic token is a digital analog of various forms of payment backed by a bank or financial institution. There are two types of tokens:

(a) **Real Time Tokens (Pre-paid tokens)**

Real time tokens are exchanged between buyer and seller, their users pre-pay for tokens that serve as currency. Transactions are settled; with the exchange of these tokens. Examples of these are DigiCash, Debit Cards etc.¹⁰
(b) Post Paid Tokens

Post paid tokens are used with fund transfer instructions between the buyer and seller. Examples - Electronic cheques, Credit card data etc.

3.6.2. Electronic, or Digital Cash

This combines computerized convenience with security and privacy that improve upon paper cash. Cash is still the dominant form of payment as: The consumer still mistrusts the banks. The non-cash transactions are inefficiently cleared. In addition, due to negative real interests rates on bank deposits, qualities of cash are:

- Cash is a legal tender i.e. payee is obligatory to take it.
- It is negotiable i.e. can be given or traded to someone else.
- It is a bearer instrument i.e. possession is proof of ownership.
- It can be held & used by anyone, even those without a bank certificate.
- It places no risk on part of acceptor.

The following are the limitations of Debit and Credit Cards:

- They are identification cards owned by the issuer & restricted to one user i.e. cannot be given away.
- They are not legal tender
- Their usage requires an account relationship and authorization system.

Properties of Digital Cash

Properties of Digital Cash are:

1. It must have a monetary value

   It must be backed by cash (currency), bank authorized credit or a bank certified cashier's check.

2. It must be interoperable or exchangeable

   As payment for other digital cash, paper cash, goods or services, lines of credit, bank notes or obligations, electronic benefit transfers and the like.

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3. It must be storable and retrievable

Cash could be stored on a remote computer’s memory, in smart cards, or on other easily transported standard or special purpose devices. Remote storage or retrieval would allow users to exchange digital cash from home or office or while travelling.

4. Should not be easy to copy or tamper with while it is being exchanged

This is achieved by using the following technologies, which are nothing but new and very efficient versions of the old art of cryptography.

Digital cash is based on cryptographic systems called "Digital Signatures" similar to the signatures used by banks on paper cheques to authenticate a customer. Purchase of digital cash from an online currency server (or bank) involves 2 steps:

(i) The first step is establishment of an account in which a unique digital number is given, which also becomes digital signature. As it is a number known only to the customer and the bank, forgery, which may be done in paper cheques becomes very difficult.

(ii) The second step is maintenance of sufficient money in the account is required to back any purchase.

3.6.3. Electronic Cheques

The electronic cheques are modeled on paper checks, except that they are initiated electronically. They use digital signatures for signing and endorsing and require the use of digital certificates for the payer, the payer's bank and bank account. They are delivered transmission using telephone lines or by public networks such as
BENEFITS OF ELECTRONIC CHEQUES

It is well suited for clearing micro payments. Conventional cryptography of e-cheques makes them easier to process than systems based on public key cryptography (like digital cash).

They can serve corporate markets. Firms can use them in more cost-effective manner. They create and float the availability of float is an important requirement of Commerce.

3.6.4. Credit Card

A credit card is an instrument of payment, which enables the cardholder to obtain either goods or services from merchants where arrangements have been made to reimburse the merchant. The outstanding amount is payable by the cardholder to the bank over a specified period which carries a fixed amount of interest also.

It is a source of revolving credit. A number of parties are involved in credit card transaction and there is a contract between the card issuer and the card holder whereby the card holder is allowed to make use of the card at specified retail outlets (membership establishment) to pay for the goods and services. There is also another separate agreement between the card organization and the member establishments. When a credit card holder makes purchases from specified retail outlets, the retail outlets make out bills to the account of the cardholder and obtain payment from the card organization which in turn makes a monthly bill to the bank which issued the card. The bank makes payments to the debit of customer's account subsequently. The whole process takes about 30 to 40 days and during this period the card holder enjoys credit¹².
3.6.5 Debit Card

Debit cards are also known as check cards. Debit cards look like credit cards or Automated teller Machine (ATM) cards, but they operate like cash or personal checks. Debit cards are different from credit cards. In short a credit card is a way to "pay later," a debit card is a way to "pay now." When a debit card is used, money is quickly deducted from the related checking or savings account. Debit cards are accepted at many locations, including grocery stores, retail stores, gasoline stations, and restaurants. Debit cards can be used anywhere merchants display the card's brand name or logo. Debit cards offer an alternative to carrying a checkbook or cash.

Debit means "subtract." When a debit card is used, money is subtracted from the related bank account. Debit cards allow only the amount in the bank account to be spent and provide for quick transactions between merchants and personal bank account.

Online debit cards are usually enhanced ATM cards that work in the same manner as an ATM transaction, allowing for an immediate electronic transfer of money from a consumer's bank account to a merchant's bank account. To access an account at a store terminal, a PIN must be entered, just as in an ATM transaction, giving the system authorization to check an account to see if it contains enough money to cover the transaction.

The main advantages of debit cards are:

(a) There is no need to carry cash.
(b) It is quick and less complicated than using a cheque.
(c) It can also be used for withdrawals of cash.
(d) Its holders can have a record of the transactions in his bank statement which will enable him to plan and control the expenditure.
(e) It can be issued to any individual without assessing credit worthiness.
3.7 ELECTRONIC PAYMENT SYSTEM (EPS)

Electronic payment systems are online payment systems. The goal of their development is to create analogs of checks and cash on the Internet.

These days, mobile ATM is also an area of focus. Banks are opening such mobile ATMs which double as mobile branches besides offering customers the facility of using their debit ATM cards as the ATMs are installed in mobile vans.

Features of EPS

An EPS implements all or some of the following features:

1. Protecting customers from merchant's fraud by keeping credit card numbers unknown to merchants.
2. Allowing people without credit cards to engage in online transactions.
3. Protecting confidentiality of customers.
4. In some cases providing anonymity of customers ("electronic cash").

Advantages of Electronic Payment System

The various factors that have led the financial institutions to make use of electronic payments are:

1. Decreasing technology cost:

   The technology used in the networks is decreasing day by day. Which is evident from the fact that computers are now dirt-cheap and e-Commerce Internet is becoming free almost everywhere in the world.

2. Reduced operational and processing cost:

   Owing to reduced technology cost the processing cost of various commerce activities becomes very less. A very simple reason to prove this is the fact that in electronic transactions we save both paper and time.
3. Increasing online commerce:

Increasing online commerce induced people to go online.

Problems in Implementing EPS

The problems in implementing electronic payment systems, especially anonymous electronic money, are:

1. Preventing double spending: copying the "money" and spending it several times. This is especially hard to do with anonymous money.
2. Making sure that neither the customer nor the merchant can make an unauthorized transaction.
3. Preserving customer's confidentiality without allowing customer's fraud.

Electronic Payment is a financial exchange that takes place online between buyers and sellers. The content of this exchange is usually some form of digital financial instrument (such as encrypted credit card numbers, electronic cheques or digital cash) that is backed by a bank or an intermediary, or by a legal tender.

3.8 RISKS ASSOCIATED WITH ELECTRONIC PAYMENTS

Electronic payments are steadily replacing traditional vehicles like currency and the paper check as a preferred means of payment in the World. The volume growth of electronic payments and the wider array of payment vehicles now in common use have made managing the risks associated with these payments more important than ever to consumers, businesses, financial institutions, and the economy as a whole.

The notion of security of payment is clearly insufficient to provide an appropriate conceptual framework for technical and institutional design of Internet payment systems. There is a need for a broader approach of risk management. Such approach recognizes that electronic payment entails a series of interrelated risks, financial risks, technological risks, operational risks, and legal risks. Some of those risks are generic to banking business; others are specific to electronic payments, such as interception of messages, break-in into security infrastructure.
Operational Risk

Operational risk arises from the potential for loss due to significant deficiencies in system reliability or integrity. Security considerations are paramount, as banks may be subjected external or internal attacks on their systems or products. Operational risk can also arise from customer misuse, and from inadequately designed or implemented electronic banking and electronic money systems. Many of the specific possible manifestations of these risks apply to both electronic banking and electronic money.

Credit Risk

Credit risk is the risk that a counter party will not settle an obligation for full value, either when due or at any time thereafter. Banks engaging in electronic banking activities may extend credit via non-traditional channels, and expand their market beyond traditional geographic boundaries. Inadequate procedures to determine the creditworthiness of borrowers applying for credit via remote banking procedures could heighten credit risk for banks. Banks engaged in electronic bill payment programs may face credit risk if a third party intermediary fails to carry out its obligations with respect to payment. Banks that purchase electronic money from an issuer in order to resell it to customers are also exposed to credit risk in the event the issuer defaults on its obligations to redeem the electronic money.

Legal Risk

Legal risk arises from violations of, or non-conformance with laws, rules, regulations, or prescribed practices, or when the legal rights and obligations of parties to a transaction are not well established. Given the relatively new nature of many retail electronic banking and electronic money activities, rights and obligations of parties to such transactions are, in some cases, uncertain. For example, application of some consumer protection rules to electronic banking and electronic money activities in some countries may not be clear. In addition, legal risk may arise from uncertainty about the validity of some agreements formed via electronic media.
SECURITY REQUIREMENT OF ELECTRONIC PAYMENT SYSTEM

There are four essential security requirements for secure electronic payment which are described below:

1. **Authentication**
   Authentication is a way to verify the buyer's identity before payments are made.

2. **Integrity**
   Integrity means that ensuring that information will not be accidentally or maliciously altered or destroyed, usually during transmission.

3. **Encryption**
   Encryption is a process of making messages indecipherable except by those who have an authorized decryption key.

4. **Non-repudiation**
   Merchants need protection against the customer's unjustifiable denial of placed orders, and customers need protection against the merchants' unjustifiable denial of past payment.

3.9 SUMMARY

E-Banking is the business option in which the transactions take place via telecommunications networks. It has been defined broadly as the business transactions of business over the web.

Traditional and Electronic Commerce can be compared on the basis of three dimensions: 1. Product 2. Process and 3. Delivery Agent.

The advantages of E-commerce are basically increased sales and decreased costs through the use of electronically media, especially the web. E-commerce is the essential pathway to implement globalization. Extended trading hours is another benefit.
E-Banking or on-line banking is a term used for performing transactions, payments etc., over the Internet through a bank, credit union or building societies under secured website. This allows customers to do their banking outside of bank hours and from anywhere where internet access is available.

The important features of online banking are
1. Electronic Bill payment
2. Fund transfer between a customer's own checking and savings accounts
3. Investment purchase or sale
4. Loan applications and all transactions, such as repayments etc. It improves the quality and efficiency of the services. It E-Banking provides convenient and delightful banking
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