
UNIT 9 E-COMMERCE

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9.0 LEARNING OUTCOMES

After studying this Unit, you should be able to:

- explain the meaning of e-commerce;
- describe the ICT tools applied in processing commercial transactions;
- examine the benefits and limitations of e-commerce;
- explain the meaning of electronic payments and electronic markets;
- highlight the role of ICTs in banking operations; and
- describe the role of computerisation in facilitating the treasury system.

9.1 INTRODUCTION

The enormous potential of Information and Communication Technologies (ICTs) to fundamentally transform the nature of economic growth and development has induced both wide-ranging hopes and apprehensions. ICTs are fast flowing phenomenon with rapid and successively overlapping waves of technical advancements and market transformation. The induction of ICTs has provided a platform for economic growth in the countries across the world.

In this Unit, we will discuss the applications of ICT in the financial and commercial sector of the economy. We will discuss about various applications such as e-payment, e-trading, e-markets, e-banking and e-treasury that facilitate e-commerce. To begin with, we will explain the meaning of e-commerce and various tools facilitating it.

9.2 E-COMMERCE: MEANING AND TOOLS

Conducting business electronically using networks and internet is known as electronic commerce. Electronic commerce (EC) is an emerging concept that describes the buying and selling of products, services and information via computer networks, including the internet. EC uses several technologies ranging from Electronic Data Interchange (EDI) to e-mail for commercial transaction processing.

EC applications began in early seventies with innovations, such as, electronic transfer of funds. However, the applications were limited to large corporations and a few small businesses. Then came Electronic Data Interchange (EDI), which expanded EC from financial transactions to other kinds of transaction processing and extended the types of participating companies from financial institutions to manufacturers, retailers and other forms of business. Today, EC is rapidly outgrowing its limited operational sphere to everywhere in the entire globe.

Intranet, Extranet and requisite computer hardware and software are used in processing EC transactions. We will now discuss these tools individually.

9.2.1 Intranet Commerce

The use of intranet is increasing rapidly not only as an internal communication system, but also as a facilitator of electronic commerce. It uses internet-based technology to provide access to a variety of information on a firm, most of which would otherwise require multiple software licenses, substantial data conversion time and different user interfaces. Intranets can facilitate electronic commerce inside a corporation, as they can be used in selling corporate products to employees and/ or selling or trading services and products among business units. Intranet can facilitate external trade as well.

Intranet can facilitate transaction processing in the following ways:

- **Efficient Transaction Entry**

Wherever appropriate, data needed by systems to support financial functions are entered only once and are updated through electronic means, consistent with the timing requirements of normal business or transaction cycles. This helps in reducing errors in transactions, as they are now maintained electronically.

- **Common Transaction Processing**

Common procedures are used for processing similar kinds of transactions, which permit the transactions to be reported in a consistent manner.

- **Consistent Internal Controls**

Internal controls over data entry, transaction processing and reporting are applied consistently throughout the system to ensure the validity of information and the protection of financial resources (Source: unknown).

Intranet is well suited to replace many paper-based information delivery systems within a firm, resulting in lower costs, easier accessibility and greater efficiency. Client access to certain parts of a firm's intranet via an extranet is a value-added service at relatively low cost that acts as a powerful marketing and communication tool.

9.2.2 Extranet Commerce

The exact definition of an extranet is still evolving, but the most universally accepted one is a network that links business partners to one another over the internet by tying together their intranets. The term 'extranet' comes from 'extended intranet'. The main goal of extranet is to foster collaboration between organisations.

An extranet uses the same basic infrastructure components including services, TCP/IP, e-mail and web browsers as the internet. It makes communication over the internet secured. It links the company's intranet with suppliers, customers and trading partners. Extranet may be used, for example, to allow inventory databases to be searched by outsiders or to transmit information on the status of an order. An extranet enables people who are located outside a company to work together with the company's internally located employees.

An extranet, like an intranet, is typically protected by a firewall and is closed to the public. It is open to selected suppliers, customers and other business partners who access it on a private wide area network over the internet or on a Virtual Private Network (VPN), which increases security and functionality.

9.3 E-COMMERCE: BENEFITS

Few innovations in human history encompass as many benefits as electronic commerce. The global nature of technology, low cost, opportunity to reach millions of people, interactive nature, variety of interaction possibilities and resourcefulness and rapid growth of the supporting infrastructure, especially the internet, result in many benefits to organisations, individuals and society. These benefits are just starting to materialise, but they will increase significantly as EC expands.

We will discuss the benefits of EC in terms of:

- Organisations
- Consumers; and
- Society

9.3.1 Organisations

EC expands the market place to national and international markets. With minimal capital outlay, a company can easily and quickly locate more customers, best suppliers and most suitable business partners world wide. In addition, it:

- decreases the cost of creating, processing, distributing, storing and retrieving paper-based information;
- allows reduced inventories and overhead by facilitating 'pull-type supply chain management'. In a pull-type system, the process starts from customer order and uses just-in-time processing. This allows product customisation and lower inventory cost;
- reduces the time between the outlay of capital and receipt of products and services;
- supports Business Re-engineering Process efforts. When processes are changed, productivity of salespeople, knowledge workers, and administrators can increase by cent percent or more;
- lowers telecommunications cost; internet is much cheaper than value-added networks (VANs);
- helps small businesses to compete with large companies;
- enables organisations to reach customers outside their immediate area at a minimum cost;
- allows organisations to reach a wide range of suppliers, thereby reducing the cost of supplies and services;
- permits the creation of efficient markets in an industry in which buyers and sellers can share benefits;
- allows companies to auction surpluses or obsolete products quickly with little expenses; and
- facilitates global trade, allowing companies to penetrate foreign markets.

9.3.2 Consumers

EC:

- provides customers with more choices; they can select from many vendors and from more products;
- frequently provides customers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons;
- allows quick delivery of products and services;
- enables customers to shop or do other transactions 24 hours a day, year round, from almost any location;
- permits customers to receive relevant and detailed information in seconds, rather than in days or weeks;

- enables consumers to get customised products from PCs to cars at competitive prices;
- makes it possible to participate in virtual auctions;
- allows customers to interact with other customers in electronic communities and to exchange ideas as well as compare experiences; and
- capitalises on the general movement from a market-centric to a customer-centric environment.

9.3.3 Society

EC:

- enables more individuals to work at home and to do less travelling, resulting in less traffic on the roads and lower air pollution;
- allows some merchandise to be sold at lower prices, so less affluent people can buy more and increase their standard of living;
- enables people in third world countries and rural areas to enjoy products and services that otherwise are not available to them. This includes opportunities to learn professions and earn college degrees; and
- facilitates delivery of public services, such as government entitlements, by reducing the cost of distribution and increasing the quality of the distributing system.

9.4 ELECTRONIC COMMERCE: LIMITATIONS

There are technical and non-technical limitations in the successful implementation of EC in the country. We will discuss the technical and non-technical limitations separately.

9.4.1 Technical Limitations

The technical limitations are as below mentioned:

- there is lack of system security, reliability, standards and communication protocols;
- there is insufficient telecommunication bandwidth;
- software development tools are still evolving and changing rapidly;
- there are difficulties in integrating the internet and EC software with some existing applications and databases;
- there is need for special web servers, in addition, to the network servers (additional cost);
- there is possible problem of interoperability, meaning that some EC software do not fit with some hardware or is incompatible with some operating systems or other components; and
- accessibility to the internet is still expensive and/or inconvenient for many potential customers.

However, these limitations can be overcome with time. Appropriate planning can help in minimising them.

9.4.2 Non-Technical Limitations

Other than technical issues, there are non-technical issues that centre EC. These issues are given below:

- many legal issues are yet unresolved;
- government regulations and standards are not refined enough for many circumstances;
- benefits of EC, such as, web advertisements are difficult to measure. In addition, the methodologies for justifying EC are still in the developmental stage;
- EC is still evolving and changing rapidly. Many people are looking for the situation to stabilise before they enter EC operation;
- customers resist change. To switch from a real to a virtual store may be difficult for many people. It seems that people do not yet sufficiently trust paperless, faceless transactions;
- there are not enough support services. For example, copyright clearance centres do not exist and quality evaluators or qualified EC tax experts are rare;
- there is a perception that EC is expensive and unsecured, so many do not want to use it yet;
- there is not yet sufficiently large number (critical mass) of sellers and buyers that is needed for profitable EC operations; and
- EC could result in breakdown of human relations.

Despite these limitations, rapid progress is occurring in EC. As experience accumulates and technology improves, the ratio of EC benefits to cost will increase, resulting in a greater rate of EC adoption.

9.5 ELECTRONIC PAYMENTS

In EC, payments between buyers and sellers can take place electronically or can be done off line. There are different modes of e-payments. Some of them are briefly mentioned below:

- **Electronic Cash**

Despite the use of cheques, credit cards and other methods of payments, cash is still the most prevalent consumer payment instrument. Merchants prefer cash as they do not have to pay commission to credit card companies and they can put the money to use as soon as it is received. In addition, some people pay with cash because they do not have cheques or credit cards, or they want to preserve their anonymity.

- **Electronic Cheques**

E-cheques are similar to regular cheques. They are secured by public-key cryptography and are even suitable for some micro payments. Here is how they work:

Step one

The customer establishes a electronic cheque service with a bank or financial institution;

Step two

The customer contacts a seller, buys a product or a service, and e-mails an encrypted electronic cheque; and

Step three

The merchant deposits the cheque in his or her account; money is debited in the buyer's account and credited to the seller's account.

Like regular cheques, e-cheques carry an encrypted signature that can be verified. The payer can attach additional information to the cheque. Properly signed and endorsed e-cheques are exchanged between financial institutions through electronic clearinghouses. An e-cheque can also be used as a payment instrument in EDI applications.

- **Electronic Payment Cards**

Electronic payment cards have been in use for several decades. The best known are credit cards, which use magnetic strips that contain limited information, such as the card's number. A more advanced form of this card is the one that you use in your library to pay for photocopies or to pay for telephone calls. Such cards store a fixed amount of prepaid money and each time you use the card the respective amount is reduced.

However, e-payments are not commonly made use of due to the following reasons:

- **Lack of Security**

Securing payments is complicated and expensive. There is no single established standard for providing security for transactions on the internet. Multiple competing standards create confusion for customers and merchants.

- **Handling Micro Payments**

Many electronic commerce transactions are valued at only a few dollars or cents. The cost of processing such micro payments needs to be very low as one would not want to pay \$5.00 to process a purchase valued at only a few dollars, especially, when many payments are even less than \$1.00.

- **Inconvenience**

The buyer must find the transaction convenient. Buyers like to select a payment method, such as, using a credit card that gives them free use of money for up to 50-60 days. However, credit card processing is too costly for micro payments.

- **Incompatibility**

There must be compatibility between the buyer and seller with respect to the methods and standards of payment. If you like to pay with electronic cash, for example, the vendor must be able to accept it.

For these reasons, many EC transactions include non-electronic or semi-electronic payments. For example, when you place an order electronically, you give your credit card number over the telephone or mail a cheque. However, paying with such traditional and non-electronic methods too has several limitations.

To increase security of e-payments, a sender can sign a message electronically with what is called a digital signature. Again, electronic certificates can be issued by a trusted third party, called a Certificate Authority (CA) to verify that specific public keys belong to specific individuals. In addition to a name, a certificate may verify age, gender and other attributes of the individual to whom the public key belongs. In addition, if the CA is not well known to the user of the certificate, it may be necessary to certify the CA by another more trustworthy legal body. Certificates are valid till the expiration date. It has to be signed by the CA. To assure that a specific sender has indeed sent a given message, the sender attaches his or her digital signature by using his or her own private key. The receiver can use the sender's public key to verify that the specific sender has sent the message. The given message and the digital signature are transmitted together but are encrypted in two different keys by the sender and decrypted in two different keys by the receiver. This will help in ensuring security for both the sender and receiver.

9.6 ELECTRONIC TRADING SYSTEM

ICTs have created paradigm shift in the securities market operations through electronic trading system. Stock exchanges all over the world have realised the potential of the new technologies and have moved on to electronic trading systems. The major changes that have swept the international financial markets since 1975 have been accelerated by the use of computers. Enormous strides were taken towards the computerisation of trading systems in both financial markets and brokerage office. In the late 1980s and in the 1990s the developing countries also moved towards liberalisation of stock markets as part of their reform programmes and attempted to attract foreign capital.

The electronic trading system (ETS) pioneered by US plays a critical role in stock trading. ETS is a set of computer terminals connected via high-speed communication lines to a central host computer. It involves the use of the internet as the medium to communicate orders to the stock exchange through a broker's website. Bids (buying), offers (selling) and trade requests can be entered from even remote terminals. Once a trade is done, confirmation is almost instantaneous and reported immediately to the investor. Computerised order routing and trading has not only enhanced the efficiency of order execution but has also led to the development of new products and trading techniques. ETS has been employed in some instances to replace and in others to complement traditional physical open outcry markets.

9.7 ELECTRONIC MARKETS

Electronic markets are rapidly emerging as a tool for conducting business and commercial transactions. A market is a network of interactions and relationships where information, products, services and payments are exchanged. When the marketplace is electronic, the business centre is not a physical one but a network-based location where business interactions occur.

In electronic markets, the principal participants-transaction handlers, buyers, brokers and sellers-not only are at different locations but seldom even know one another. They meet online or through the web and all necessary transactions including transfer of money are handled electronically through the net.

Electronic Retailing and Malls

For generations home shopping from catalogues has flourished and television-shopping channels have been attracting millions of shoppers for over a decade. However, television shopping is limited to what is shown on the screen and paper catalogues are sometimes inaccurate. Who would not enjoy the convenience of shopping just by sitting down in front of a computer? The web is open 24 hours a day, 7 days a week, offering a wide variety of products including the most unique items, usually at a lower price. And even if you have to pay the same price, you do not have to spend time for the same or wait for salespeople or push your way through hordes of shoppers. And frequently, you can get your package the next day at no extra cost. Finally, you can shop from anywhere at any time.

Electronic retailing is direct sale (business to customers) through electronic storefronts, usually designed around a catalogue format. Some companies, such as, Wal-Mart sell to corporations as well, usually at discounts for larger quantities. Electronic retailing is mushrooming on the web. There are two types of vendors, namely, solo storefronts and electronic malls. Solo storefronts maintain their own internet name and web site and may or may not be affiliated with electronic malls. Whereas, electronic mall, also known as cyber mall, is a collection of individual shops under one internet address. The basic idea of an electronic mall is the same as that of a regular shopping mall, to provide a place that offers many products and services at one location. Some cyber malls include diverse stores, while others deal with one type of goods, such as, clothing or sporting goods etc.

ICT also enables one stop shopping over multiple malls known as meta malls. Meta malls allow customers to shop in different department stores and many individual stores using one search engine to find items. In addition, it enables the customers to pay only once in a highly secure system. Meta mall can provide other services, such as, comparative pricing and finding substitute products.

9.8 ICT AND BANKING

ICTs are also being used in the banking sector facilitating banking operations and transactions. With the application of ICTs in banking operations and computerisation of banks, banking activities have become easy, efficient, speedy and transparent. With the setting up of ATMs one may get the banking services at any place in the country.

This has lessened long queues in the banks. Rendering online banking services has offered users an unprecedented level of control over their finances. Electronic banking has enabled capabilities ranging from paying bills to securing loans electronically.

There's no waiting until the monthly statement to find out the awful truth about that sudden shopping spree. With a few mouse clicks you can move money to or from other accounts, maximising the interest you receive on savings or minimising bank charges.

While online banking gives you control, many of us may still be worried that if we can view such sensitive information online, then so can others. The banking industry insists that

its security technology has improved and the customers can have confidence in the system.

9.9 COMPUTERISATION OF TREASURY SYSTEM

With computerisation of treasuries, the efficiency and accuracy of financial transactions had been improved tremendously. The Treasury Information System (TISNIC) – version 3.0 software helps in:

- bill passing;
- budget controlling;
- on line cheque generation;
- receipt accounting; and
- accounting through computer at the treasury level and generating information for the State Government, Financial and Statistical Directorate, DDO's, HOD's, etc.

9.10 CONCLUSION

There is a profound impact of ICTs on the functioning of vital sectors of the economy today. Commerce, trade, agriculture, banking, rural development is affected by the electronic transformation being brought about by various technologies like internet and web. Financial and commercial transactions have been facilitated through electronic mode of payments, electronic trading system, electronic markets and electronic banking. Infrastructure in the form of institutions for software development, more resources in terms of finances and professionals and security is very much required to make e-economy more viable.

9.11 ACTIVITY

1. By now you would have got enlightened with the role and applications of ICTs in various sectors of our economy. Please let us know the role played by ICTs in budgetary functions of the government.
2. Narrate about any experiment or software existing for rural economic development in our country.

9.12 KEY CONCEPTS

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|------------|---|--|
| E-commerce | : | business that is conducted over the internet using any of the applications that rely on the internet, such as e-mail, instant messaging, shopping carts, web services, UDDI, FTP, and EDI, among others. Electronic commerce can be between two businesses transmitting funds, goods, services and/or data or between a business and a customer. |
| EDI | : | short for Electronic Data Interchange, the transfer of data between different companies using networks, such as VANs or the internet. As more and more |

companies get connected to the internet, EDI is becoming increasingly important as an easy mechanism for companies to buy, sell and trade information. ANSI has approved a set of EDI standards known as the X12 standards.

- Extranet : a buzzword that refers to an intranet that is partially accessible to authorised outsiders. Whereas an intranet resides behind a firewall and is accessible only to people who are members of the same company or organisation, an extranet provides various levels of accessibility to outsiders. You can access an extranet only if you have a valid username and password and your identity determines which parts of the extranet you can view. Extranets are becoming a very popular means for business partners to exchange
- TCP : abbreviation of Transmission Control Protocol and is pronounced as separate letters. TCP is one of the main protocols in TCP/IP networks. Whereas the Internet Protocol deals only with packets, TCP enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent.
- WAN : a computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more local-area networks (LANs). Computers connected to a wide-area network are often connected through public networks, such as the telephone system. They can also be connected through leased lines or satellites. The largest WAN in existence is the internet.
- Pull type : to request data from another programme or computer. The opposite of pull is push, where data is sent without a request being made. The terms push and pull are used frequently to describe data sent over the internet. The World Wide Web is based on pull technologies, where a page isn't delivered until a browser requests it. Increasingly, however, information services are harnessing the internet to broadcast information using push technologies. A prime example is the PointCast Network.
- VAN : Value Added Network refers to a private network provider that leases communication lines to its subscribers. VANs provides specialised services, such as, assisting with EDI, extra security, message delivery or access to a particular database.

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