



## E-Commerce Concepts and Models

---

“शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।”

- इन्दिरा गांधी

---

---

*"Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances."*

-Indira Gandhi

---

Block

1

**E-COMMERCE CONCEPTS AND MODELS****UNIT 1**

<b>Introduction to E-Commerce</b>	<b>5</b>
-----------------------------------	----------

**UNIT 2**

<b>Elements of E-Commerce</b>	<b>15</b>
-------------------------------	-----------

**UNIT 3**

<b>Electronic Data Interchange and Electronic Payment Systems</b>	<b>25</b>
---	-----------

**UNIT 4**

<b>Introduction to E-Commerce Models</b>	<b>33</b>
--	-----------

## **PROGRAMME DESIGN COMMITTEE**

Prof. Manohar Lal SOCIS, IGNOU, New Delhi	Prof. Arvind Kalia, Dept. of CS HP University, Shimla	Sh. Akshay Kumar Associate Prof. SOCIS, IGNOU, New Delhi
Prof. H. M. Gupta Dept. of Elect. Engg. IIT, Delhi	Prof. Anju Sahgal Gupta SOH, IGNOU, New Delhi	Dr. P. K. Mishra, Associate Prof. Dept. of CS, BHU, Varanasi
Prof. M. N. Doja, Dept. of CE Jamia Millia, New Delhi	Prof. Sujatha Verma SOS, IGNOU, New Delhi	Dr. P. V. Suresh, Associate Prof. SOCIS, IGNOU, New Delhi
Prof. C. Pandurangan Dept. of CSE, IIT, Chennai	Prof. V. Sundarapandian IITMK, Trivandrum	Sh. V. V. Subrahmanyam Associate Prof. SOCIS, IGNOU, New Delhi
Prof. I. Ramesh Babu Dept. of CSE Acharya Nagarjuna University Nagarjuna Nagar (AP)	Prof. Dharamendra Kumar Dept. of CS, GJU, Hissar	Sh. M. P. Mishra, Asst. Prof. SOCIS, IGNOU, New Delhi
Prof. N. S. Gill Dept. of CS, MDU, Rohtak	Prof. Vikram Singh Dept. of CS, CDLU, Sirsa	Dr. Naveen Kumar, Reader SOCIS, IGNOU, New Delhi
	Sh. Shashi Bhushan Associate Prof. SOCIS, IGNOU, New Delhi	Dr. Subodh Kesharwani, Asst. Prof. SOMS, IGNOU, New Delhi

## **COURSE CURRICULUM DESIGN COMMITTEE**

Sh. Shashi Bhushan SOCIS, IGNOU, New Delhi	Prof. A. K. Tripathi Dept. of CSE, IIT(BHU), Varanasi	Sh. Akshay Kumar SOCIS, IGNOU, New Delhi
Dr. P. V. Suresh SOCIS, IGNOU, New Delhi	Dr. S. R. N. Reddy Dept. of CSE IGDTUW New Delhi	Prof. Manu Sood, Dept. of CS HP University Shimla
Sh. V. V. Subrahmanyam SOCIS, IGNOU, New Delhi		Sh. M. P. Mishra SOCIS, IGNOU, New Delhi
Dr. Naveen Kumar SOCIS, IGNOU, New Delhi		

## **SOCIS FACULTY**

Sh. Shashi Bhushan, Director	Prof. Manohar Lal	Dr. P. V. Suresh
Sh. Akshay Kumar Associate Professor	Sh. V. V. Subrahmanyam Associate Professor	Associate Professor
Sh. M. P. Mishra Asst. Professor	Dr. Sudhansh Sharma Asst. Professor	Dr. Naveen Kumar Reader

## **PREPARATION TEAM**

Content Editor:	Block Writers:	Unit 3
Dr. P. V. Suresh School of Computer and Information Sciences IGNOU, New Delhi	Unit 1 Sh. T. Lakshmana Kumar Project Manager, Sri Parimala Software Services	Sh. Shailesh Kumar Shiva Kumar, Research Scholar (SOCIS, IGNOU) and Senior Technology Architect (Infosys Technologies)
Language Editor:	Unit 2 Ms. Suman Madan, Faculty, JIMS, GGSIPU New Delhi	Unit 4 Ms. Neelam Kumari, Consultant, NCERT New Delhi
Sh. P. Lakshmi Kantham (Retd.), Tenali		

**Course Coordinator:** Dr. P. V. Suresh, SOCIS, IGNOU, New Delhi

## **PRINT PRODUCTION**

<b>Mr. Rajeev Girder</b> <b>Asst. Registrar (Pub.)</b> <b>MPDD-IGNOU</b>	<b>Mr. Tilak Raj</b> <b>Section Officer (Pub.)</b> <b>MPDD-IGNOU</b>
--	--

October, 2014. (Reprint)

© Indira Gandhi National Open University, 2014

**ISBN-978-81-266-6669-0**

All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from the Indira Gandhi National Open University. Further information on the Indira Gandhi National Open University courses may be obtained from the University's office at Maidam Garhi, New Delhi-110 068.

**Printed and published on behalf of the Indira Gandhi National Open University,  
New Delhi by the Registrar, MPDD.**

**Printed at :** Public Printing (Delhi) Service, C-80 Okhla Industrial Area, Phase I, N.D-20

## COURSE INTRODUCTION

---

This course introduces the learner to the subject of E-commerce.

With the increase in usage of Internet, there was a shift from the way business is done in traditional manner. People who have access to Internet are performing transactions using it, wherever possible. Due to the shift to usage of Internet, e-commerce has gained prominence. Companies started deploying their business activities through Internet to expand the reach globally. Due to e-commerce, it has become possible to reduce the involvement of number of entities when compared to traditional way of doing business thus leading to reduction in the cost. People started saving their time and money due to e-commerce. Moreover, it also provides large number of options as well as more outlook due to presence of online reviews, price comparisons, etc. Advent of e-commerce had lead to better quality of life as it also leads to more green environment. There are e-shops which deliver goods physically and accept payment on delivery. Also, there are e-shops which accept payment online. Due to the advent of e-commerce, Internet security has come into focus as any threats due to Internet are to be immediately viewed from the perspective of e-commerce also. Sensitive information is transmitted across networks during e-commerce transactions. Information related to credit/debit cards, bank accounts, passports, user names, passwords are some of the examples. There is need to ensure their security in transmission during e-commerce transactions. Hence, different security related technologies such as SSL are deployed. Still, there were several instances of breaches of security coming to fore due to e-commerce transactions. Due to advent of e-commerce, B2B, etc. has become reality.

Several practices had emerged due to e-commerce. Shops like Amazon have become leading companies in Globe due to their e-commerce practices. Globally, Countries started developing Information Technology Acts as the existing acts do not have provisions to deal with issues that arise due to deployment of Information Technology. Increase in the number of cyber crimes has been reported. At the same juncture, there was a revolution in mobility related technologies and consequently, number of persons using mobile devices had increased rapidly. Due to advent of m-commerce, businesses started expanding to mobile devices and increasing number of persons are using mobile devices such as mobile phones, tablets etc. to perform transactions.

This course consists of two blocks:

Block 1 deals with the concepts related to e-commerce and associated models. It covers various elements of e-commerce, EDI and EPS.

Block 2 showcases practices in e-commerce. It introduces e-businesses such as Internet based bookshops. It also covers security issues. It concludes with an introduction to m-commerce and a case study.

## BLOCK INTRODUCTION

---

This block introduces learner to e-commerce, its elements, models and EDI (Electronic Data Interchange) and EPS (Electronic Payment Systems).

E-commerce stands for *Electronic Commerce* and caters to trading in goods and services through the electronic medium such as desktop computer, Laptop, mobile with the help of Internet. It involves the use of Information and Communication Technology (ICT) and Electronic Funds Transfer (EFT) in making commerce between consumers and organizations, organization and organization or consumer and consumer. With the growing use of Internet worldwide, Electronic Data Interchange (EDI) has also increased in larger amounts and so has flourished e-commerce with the prolific virtual Internet bazaar inside the digital world which is termed as e-mall.

E-commerce is growing at a record pace and many businesses are trying to setup store fronts in cyberspace and are targeting at selling stuff on the web. The term E-commerce means using Internet for sale and purchase of goods, pre and after sale services and maintain long term relationships with customers. The basic elements required in e-commerce are: e-commerce website, a server, users and proper Internet connection.

Basically an EDI is a structured, machine readable document used in business exchanges. Employing EDIs in business functions would reduce the overall transaction time and automates the process. Some of the examples of EDI include purchase orders, sales orders, invoices, bills, etc. EDIs are pre-dominantly used in B2B scenario.

Any exchange of commodity made through electronic medium is called e-commerce. E-commerce is available to the user through EFT, supply chain management, Internet marketing, online transaction processing, EDI, inventory management systems, and automated data collection systems. Modern e-commerce typically uses the World Wide Web. E-commerce and e-business are interrelated. Through e-commerce, technology enabled and technology mediated transactions happen.

This block consists of four units and is organized as follows:

Unit 1 introduces e-commerce. It defines e-commerce and m-commerce along with their scope. It also covers e-commerce trade cycle, electronic markets, internet commerce, and benefits and impact of e-commerce.

Unit 2 deals with elements of e-commerce. It covers e-visibility, e-shops, elements involved in delivery of goods and services, online payment, as well as e-commerce security.

Unit 3 deals with EDI and EPS. Apart from introducing EDI and EPS, it covers EDI's layered architecture, EDI technology and standards, EDI communications and transactions as well as benefits and applications of EDI. With respect to EPS, it explains e-credit accounts and e-money.

Unit 4 introduces models of e-commerce apart from explaining inter-organization and intra-organization e-commerce.

# **UNIT 1 INTRODUCTION TO E-COMMERCE**

---

## **Structure**

- 1.0 Introduction
- 1.1 Objectives
- 1.2 Definition of E-commerce
- 1.3 Scope of E-commerce
- 1.4 Definition of M-commerce
- 1.5 Scope of M-commerce
- 1.6 E-commerce Trade Cycle
- 1.7 Electronic Markets
- 1.8 Internet Commerce
- 1.9 Benefits and Impact of E-commerce
- 1.10 Summary
- 1.11 Answers to Check Your Progress
- 1.12 Further Readings

---

## **1.0 INTRODUCTION**

---

E-commerce stands for *Electronic Commerce* and caters to trading in goods and services through the electronic medium such as desktop computer, Laptop, mobile with the help of Internet. It involves the use of Information and Communication Technology (ICT) and Electronic Funds Transfer (EFT) in making commerce between consumers and organizations, organization and organization or consumer and consumer. With the growing use of Internet worldwide, Electronic Data Interchange (EDI) has also increased in larger amounts and so has flourished e-commerce with the prolific virtual Internet bazaar inside the digital world which is termed as e-mall.

We now have access to almost every need of our daily lives at competitive prices on the Internet. No matter one is educated or illiterate, an urban or a countryman, in India or in U.K; all you need is an Internet connection and Net Banking/Credit Card/Debit Card. In fact, some companies also do Cash On Delivery (COD). With e-commerce then, you can buy almost anything you wish for without actually touching the product physically and inquiring the salesman. From pizza to pair of shoes, we have everything on sale on the Internet available with tempting offers. The most popular websites are Snapdeal.com, Amazon, eBay, Naaptol, Myntra, etc.

---

## **1.1 OBJECTIVES**

---

After going through this unit, you should be able to know the

- terminology of e-commerce,
- advantages and limitation of e-commerce,
- terminology of m-commerce, and
- impact of electronic markets on the society.

## 1.2 DEFINITION OF E-COMMERCE

Vladimir Zwass defined E-commerce as sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks.

He pointed out that e-commerce includes not only buying and selling goods over Internet, but also various business processes within individual organizations that support the goal. Four different types of information technology are converging to create the discipline of e-commerce:

- E-mail and fax
- Sharing a corporate digital library
- EDI and EFT
- Electronic publishing to promote marketing, advertising, sales, and customer support

Daniel Minoli and Emma Minoli gave their view of e-commerce as follows:

E-commerce is the symbiotic integration of communications, data management, and security capabilities to allow business applications within different organizations to automatically exchange information related to the sale of goods and services.

Another Definition for E-commerce is given below:

"A type of business model, or segment of a larger business model, that enables a firm or individual to conduct business over an electronic network, typically the Internet."

Electronic commerce operates in all four of the major market segments: business to business (B2B), business to consumer (B2C), consumer to consumer (C2C) and consumer to business (C2B). It can be thought of as a more advanced form of mail-order purchasing through a catalog. Almost any product or service can be offered via e-commerce, from books and music to financial services and flight tickets.

## 1.3 SCOPE OF E-COMMERCE

E-commerce encompasses one or more of the following:

- EDI
- E-mail
- Shopping on World Wide Web
- Product sales and services on the Web
- EFT
- Outsourced Customer and Employee care operations

The advantage of e-commerce is to transact online. Transaction through online can be either on products or services. Most of us are aware of buying products online through some sites like e-bay or amazon.com. Almost everything from gym equipment to laptops, from apparels to jewelries, is purchased online in this age of e-commerce. While these are products, people are also buying services online. Consultants to business lawyers are offering their services online to their potential clients.

Customers are also eager to transact online, as it is much hassle-free. Moreover, there is enough freedom offered to them to go online, look for a product, and compare a few models of different models, along with their prices. The bonus is that the customer can also go to other online product review sites, and discussion forums. Once the customer likes a product after all research, s/he can order for it online. E-commerce has also made it easy to pay. A number of methods have evolved to pay your dealers such as Credit Cards, Debit Cards, PayPal account, Direct Online Money Transfer etc. Once the payment is

made, the dealers dispatch the product, which reaches the doorstep of the customers within few days.

As business means keeping your customers happy and doing things the way they like, businessmen are choosing e-commerce to traditional business. In fact, companies which already exist in traditional forms are also going for the extra option of online business for the ease of the customers. To cite a good example here would be Wal-mart. Although they have huge stores, they have gone online with their business. So, even if the customers cannot make it to their store, they can still log on and order things of their need. Factors that encourage the businessmen include the fact they do not have to set up a real store and spend a bulk of money for its maintenance. A real store also means employing large number of employers, salary of which also needs to be borne by the entrepreneur. And, of course, similar to customers, businessmen also love the idea of receiving their payments online which is fast, hassle-free, and reliable. Figure 1.1 depicts E-commerce work flow.

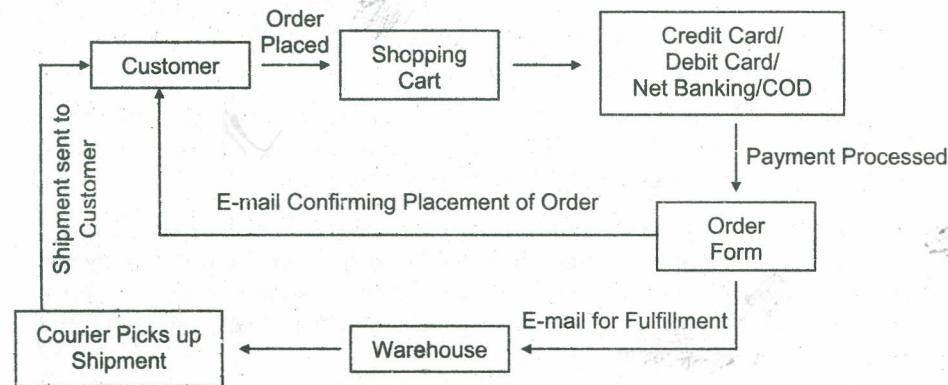


Figure 1.1: E-commerce Work-Flow

The field of E-commerce is very broad. There are many applications of E-commerce such as home banking, shopping in electronic malls, buying stocks, finding a job, conducting an auction, collaborating electronically with business partners around the globe, and providing customer service. The implementation of various E-commerce applications depend on four major support categories such as people, public policy, and marketing/advertising and supply chain logistics. In addition, there has to be infrastructure support.

## 1.4 DEFINITION OF M-COMMERCE

M-commerce stands for *Mobile Commerce*. Sometimes, it is also referred to as *Mobile E-commerce* as its transactions are basically electronic transactions conducted using a mobile terminal and a wireless network. Mobile terminals include all portable devices such as mobile phones, PDAs, as well as devices mounted on the vehicles that are capable of accessing wireless networks and perform m-commerce transactions. One definition of m-commerce describes it as *any transaction with a monetary value that is conducted via a mobile telecommunications network*. Some other definitions tend to ignore Telematics, an important feature of m-commerce. For instance, m-commerce is the *buying and selling of goods and services, using wireless hand-held devices such as mobile telephones or personal data assistants (PDAs)*.

M-commerce is also defined as use of information technologies and communication technologies for the purpose of mobile integration of different value chains and business processes, and for the purpose of management of business relationships.

Another definition of m-commerce is the delivery of trusted transaction services over mobile devices for the exchange of goods and services between consumers, merchants and financial institutions.

## 1.5 SCOPE OF M-COMMERCE

**Mobile Banking:** This application makes it possible to perform bank-related transactions such as checking account status, transferring money and selling stocks, via mobile devices, independent of the current user location.

**Mobile Entertainment:** This application offers services that provide entertainment through mobile devices such as ring tones, music and videos, gaming and chatting etc.

**Mobile Information Services:** This term refers to mobile services that provide subscribers with content that provides information. Examples of such services are news updates of any nature (finance, politics, sport, etc.), travel information, access to search engines and Mobile Office (e-mails, appointments, etc.).

**Mobile Marketing:** This term refers to services based on mobile communication technologies that provide firms with new and innovative instruments to increase sales, win and retain customers, improve after-sales service, build and sustain a positive and modern image/brand and carry market research.

**Mobile Shopping:** This application bundles services that allow for of transactions involving purchase of goods using mobile devices. The user can purchase products by choosing them from a catalogue accessible from a mobile device.

**Mobile Ticketing:** All services that must be paid for, before a lawful utilization can take place, are suitable for Mobile ticketing such as travelling in public transport, entry to a cultural event or cinema. This application ensures that the user can purchase a right to utilization/ticket with a mobile device, replacing the conventional paper ticket. The ticket is sent in digital form to the mobile device.

**Telematics Services:** Telematics is an artificial term that refers to innovative technologies that link telecommunication technologies with informatics. The transport segment has been the primary area of this application, which is also known as Intelligent Transport System (ITS). The main services are for navigation systems, remote diagnosis as well as access to other mobile applications such as mobile entertainment, mobile content/office, mobile banking and mobile shopping.

### ☛ Check Your Progress 1

- (1) Buying and selling goods over the Internet is called \_\_\_\_\_.
- (2) The use of E-commerce is growing rapidly (True/False).
- (3) Any transaction with a monetary value that is conducted via a mobile telecommunications network is known as \_\_\_\_\_.

## 1.6 E-COMMERCE TRADE CYCLE

A trade cycle is a series of exchanges that take place between a customer and supplier when a commercial deal is executed. A general trade cycle consists of the following phases:

Pre-sales (finding a supplier and agreeing the terms), Execution (selecting goods and taking delivery), Settlement (Invoice, if any and payment) and After-sales (following up complaints or providing maintenance).

For business-to-business transactions, the trade cycle typically involves the provision of credit with execution preceding settlement whereas in C2B transactions, these two steps are typically coincident. The nature of the trade cycle can indicate the e-commerce technology most suited to the exchange.

EDI (Electronic Data Interchange) is the e-commerce technology appropriate to these exchanges. The trade cycle includes the following operations: search, negotiate, order, deliver, invoice, payment and after-sales.

Consumer transactions tend to be once-off (or at least vary each time) and payment is made at the time of the order. The trade cycle in the case of retail exchanges is different and includes the following operations: search, order, payment, deliver and after-sales.

## 1.7 ELECTRONIC MARKETS

The use of the Internet and Electronic Commerce in the late '90s caused the disappearance of intermediaries between the buyer and seller. A seller could sell his products and services directly to a buyer without an intermediary in between. With the advances in the development of E-commerce technologies, new types of intermediaries were established. These new intermediaries were offering new value added services. New intermediaries attract a lot of new buyers and sellers with new services that support the trading process between them. This new way of doing business describes the e-marketplace or simply electronic markets, which represent one of the new business models developed in the late '90s. The e-marketplace is the result of using innovative technology in business processes.

Doing business on the e-marketplace enables sellers to enter new markets, to find new buyers, and to increase sales. On the other side, the e-marketplace gives access to a broader range of products and services offered by sellers to buyers. A buyer has the option to quickly compare various offers by price and quality measures. The e-marketplace services support the exchange of large amounts of data about the supply and demand between the buyer and seller, and the implementation of business transactions.

There are many different business models of e-marketplaces. In practice, we can find a lot of evidence that the e-marketplace is supporting many different processes between a buyer and a seller. Some e-marketplaces support only the aggregation of supply and demand, and the searching and matching of buyers or sellers. In addition, many e-marketplaces support different types of auctions and negotiations. On the other hand, not many e-marketplaces support the entire trading process where business services such as contracting, finances, logistics, insurance, legal, payments and other services are needed.

The e-marketplace is a virtual marketplace where buyers and suppliers meet to exchange information about product and service offers, and to negotiate and carry out business transactions. Furthermore, in the age of Internet, and with the emergence of new communication technologies, the e-marketplace is a web based information system, where multiple suppliers and multiple buyers can undertake business transactions through Internet. The e-marketplace uses Internet technologies and standards to distribute product data and to facilitate online transactions.

An intermediary can provide the following four important mechanisms that cause marketplaces to add value:

- Matching buyers and sellers to negotiate prices on a dynamic and real-time basis,
- Ensuring trust among participants by maintaining a neutral position,
- Facilitating market operations by supporting certain transaction phases, and
- Aggregating a large number of buyers and sellers together.

Intermediary functions may support a multiplicity of activities, including auctions, payments, logistics, legal, consulting, or may support inter-company communications through third party inter-organizational systems and related systems.

The success of the e-marketplace depends on the net benefit to buyers and suppliers. From the viewpoint of transaction cost economics, helps to reduce transaction costs, risks, and coordination costs by the utilization of e-marketplaces.

In order to understand strategic implications of the e-marketplace, we must focus on the following characteristics:

- An e-marketplace system can reduce customers costs for obtaining information about the prices and product offers of alternative suppliers as well as suppliers costs for communicating information about their prices and product characteristics to customers.
- The benefits to individual participants in an e-marketplace increase as more organizations join the system.
- The e-marketplace can impose significant switching costs on its participants.
- The e-marketplace typically requires large capital investments and offers substantial economies of scale and scope.
- Potential participants on the e-marketplace face substantial uncertainty with regard to the actual benefits of joining such a system. Occasionally, this uncertainty remains even after an organization joins the system.

We may divide e-marketplaces into horizontal and vertical marketplaces. A horizontal marketplace addresses a specific function (e.g. human resources, office supplies) and serves a wide range of industries, while a vertical marketplace focuses on a wide range of functions in a specific industry, such as chemicals, steel or automotives.

We may also classify marketplaces into four categories:

- MRO (Maintenance, Repair, Operations) hubs are horizontal markets that enable systematic sourcing of operating inputs,
- Yield managers are horizontal markets that enable spot sourcing of operating inputs,
- Exchanges are vertical markets that enable spot sourcing of manufacturing inputs, and
- Catalogue hubs are vertical markets that enable systematic sourcing of manufacturing inputs.

As previously mentioned, an intermediary provides different services to buyers and suppliers on the e-marketplace. The most commonly used services on today's e-marketplaces are related to maintaining a product e-catalogue, negotiating support and performing online auctions. The aim of e-marketplace service providers is to provide a wide range of services to all the participants on the e-marketplace. Among others, these services include product development, logistics and insurance services, payments and other similar services. There are not many marketplaces operating today that offer such a wide range of services. Most of them are oriented in providing services of matching buyers and sellers, negotiation and auction services.

The e-marketplaces are new business models that are developing and changing very rapidly. Therefore, it is important that the business environment encourages organizations to use such models to gain a competitive advantage in the global market. Governments need to play a key role in such activities.

## 1.8 INTERNET COMMERCE

By Internet commerce, we mean the use of Internet for purchase and sale of goods, services, including service and support after sale. Internet commerce brings some new technology and new capabilities to business. In short, it is nothing but commercial activities associated with the Internet. These are divided into two main categories as given below.

**Transplanted Real-World Business Models:** Business activities which occur naturally in real-world and have been transplanted onto the Internet.

The following are some of the business models that fall into the above mentioned category.

- **Mail-Order Model:** A web site shop front is employed to sell physical goods which are then posted or delivered (Amazon.com).
- **Advertising Based Model:** Where advertising revenues support the operation of a free service (Yahoo.com).
- **Subscription Model:** Users subscribe for access to a database of digital products; well suited for combination with digital delivery (informationweek.com).
- **Free Trial Model:** Software is available for free download or distributed on CD-ROM but will only work for a limited period or will not be fully functional until a fee is paid.
- **Direct Marketing Model:** The use of e-mail based direct marketing (often ends up as spam).
- **Real Estate Model:** Sell web space, domain names and e-mail addresses.
- **Incentive Scheme Models:** Opportunities to win prizes or to secure "free" or inexpensive goods or services are used to entice people to accept advertising or to provide personal information.
- **B2B:** Businesses transact between corporate entities via the Internet, including financial, research, legal and employment services.

Apart from above mentioned models, the combination of above mentioned models also exist.

**Native Internet Business Models:** Business activities that have evolved in the Internet environment and are native to it.

The following are some of the business models that fall into above mentioned category:

- **Library Model:** The web site that offers free information.
- **Freeware Model:** It provides free software (basic versions may be free) or open source software.
- **Information Barter Model:** Some sort of exchange of information over the Internet between individuals and organizations.
- **Digital Products Model:** Images, movies, animation, audio, text, certificates and software will be available as products.
- **Digital Delivery Model:** Takes place when digital products are purchased.
- **Access Provision Model:** Provides access to Internet from enterprises called Internet Service Providers (ISPs).
- **Website Hosting and Other Internet Services:** Hosting web servers, e-mail as well as URL and e-mail re-direction services.

## 1.9 BENEFITS AND IMPACT OF E-COMMERCE

The following are the benefits of E-commerce to organizations:

- Expands a company's marketplace to national and international markets. With minimal capital outlay, a company can quickly locate more customers, the best suppliers, and the most suitable business partners worldwide.
- Enables companies to procure material and services from other companies, rapidly and at less cost.

- Shortens or eliminates marketing distribution channels, making products cheaper and vendor's profits higher.
- Decreases (by as much as 90 percent) the cost of creating, processing, distributing, storing, and retrieving information by digitizing the process.
- Allows lower inventories by facilitating pull-type supply chain management. This allows product customization and reduces inventory costs.
- Reduces telecommunication costs as Internet tools are used.
- Helps small businesses compete against large businesses.
- Enables a very specialized niche market.

The following are the benefits of E-commerce to customers:

- Provides products at reduced cost as well as services by allowing consumers to conduct quick online comparisons.
- Gives more choices to consumers than they could locate otherwise.
- Enables customers to shop or make transactions 24X7 from any location.
- Delivers relevant and detailed information.
- Enables consumers to get customized products from PCs to Cars at competitive prices.
- Makes it possible for people to work and study at home.
- Makes electronic auctions possible.
- Allows consumers to interact with electronic communities and to exchange ideas and compare experiences.

The following are the benefits of E-commerce to society at large:

- Enables individuals to work from home and to do less travelling, resulting in increased productivity.
- Allows merchandise to be sold at lower prices, thereby increasing people's standard of living.
- Enables people in developing countries and rural areas to enjoy products and services that are otherwise difficult to buy. This includes opportunities to learn and earn college degrees, or to receive better medical care.
- Facilitates delivery of public services, such as government entitlements, reducing the cost of distribution and chance of fraud, and increasing the quality of social services, health care, and education.

### 1.9.1 Impact of E-commerce

E-commerce and E-business are not solely the Internet, websites or dot com companies. It is about a new business concept that incorporates all previous business management and economic concepts. As such, e-business and e-commerce impact many areas of business and disciplines of business management studies.

The following are some of the areas which have an impact of E-commerce:

- **Marketing:** Issues of online advertising, marketing strategies, consumer behaviour and cultures. One of the areas in which it impacts particularly is direct marketing. In the past, this was mainly door-to door, home parties and mail order using catalogues or leaflets. This moved to telemarketing and TV selling with the advances in telephone and television technology and finally developed into e-marketing spawning 'e-CRM' (Electronic Customer Relationship Management), data mining etc. by creating new channels for direct sales and promotion.

- **Computer Sciences:** Development of different technologies and languages to support e-commerce and e-business. Linking front and back office legacy systems with web based technologies is an example.
- **Finance and Accounting:** Online banking has become popular with complex transactions becoming possible without physically going to bank.
- **Economics:** There was a positive impact of e-commerce on local and global economies leading to understanding the concepts of a digital and knowledge based economy.
- **Production and Operations Management:** The impact of on-line processing has led to reduced cycle times. It takes seconds to deliver digitized products and services electronically; similarly the time for processing orders can be reduced by more than 90 per cent from days to minutes. Production systems are integrated with finance marketing and other functional systems as well as with business partners and customers.
- **Production and Operations Management (Manufacturing):** Moving from mass production to demand-driven, customer pull rather than the manufacturer push of the past has become possible. Web based Enterprise Resource Planning (ERP) systems can also be used to forward orders directly to designers and/or production floor within seconds, thus cutting production cycle times by up to 50 per cent, especially when manufacturing plants, engineers and designers are located in different countries. In sub-assembler companies, where a product is assembled from a number of different components sourced from a number of manufacturers, communication, collaboration and coordination are critical. So, electronic bidding can yield cheaper components and having flexible and adaptable procurement systems allow for rapid changes at a minimum cost leading to minimized inventories and savings.
- **Management Information Systems:** There has been an impact on analysis, design and implementation of e-business systems within an organization as well as issues of integration of front end and back end systems.
- **Human Resource Management:** There has been an impact leading to online recruitment and working from home.
- **Business Law and Ethics:** There has been an impact on different legal and ethical issues that have arisen as a result of a global virtual market and on issues such as copyright laws, privacy of customer information, legality of electronic contracts, etc.

#### Check Your Progress 2

- (1) EDI stands for \_\_\_\_\_.
- (2) \_\_\_\_\_ is a virtual marketplace where buyers and suppliers meet to exchange information about product and service.
- (3) Traditional commerce helps small businesses compete against large businesses (True/False).

## 1.10 SUMMARY

In this unit, we discussed E-commerce starting from the definition to scope, its benefits and impact on the society as a whole. M-commerce is also discussed very briefly. The trade cycle of E-commerce is explained. The virtual market place, also known as E-markets, and their characteristics are discussed. Commercial activities associated with Internet such as Internet Commerce are discussed.

## 1.11 ANSWERS TO CHECK YOUR PROGRESS

### Check Your Progress 1

- (1) E-commerce
- (2) True
- (3) M-commerce

### Check Your Progress 2

- (1) Electronic Data Interchange
- (2) E-Market
- (3) False

## 1.12 FURTHER READINGS

### References

1. *E-commerce 2013* Laudon, Kenneth, Traver, Carol Guercio, Pearson Edition.
2. *Introduction to Electronic Commerce* (3rd Edition) Turban, Efraim, King, David, Lang, Judy, Prentice Hall.
3. *Electronic Commerce: Structures and Issues* by Vladimir Zwass; Published in International Journal of E-commerce (Special section: Diversity in electronic commerce); Volume 1, Issue 1, September 1996.
4. *Web Commerce Technology Hand Book* by Daniel Minoli and Emma Minoli; Computing McGraw Hill; 1997.
5. [http://seacorn.cs.ucy.ac.cy/papers/files/m-commerce-final\\_revised.pdf](http://seacorn.cs.ucy.ac.cy/papers/files/m-commerce-final_revised.pdf)
6. <http://wiki.answers.com>
7. <http://en.wikipedia.org/wiki/E-commerce>

## **UNIT 2 ELEMENTS OF E-COMMERCE**

---

### **Structure**

- 2.0 Introduction
- 2.1 Objectives
- 2.2 E-Visibility
- 2.3 E-Shops
- 2.4 Delivery of Goods and Services
- 2.5 Online Payments
  - 2.5.1 Credit Cards
  - 2.5.2 Debit Cards
  - 2.5.3 Smart Cards
  - 2.5.4 EFT (Electronic Fund Transfer)
  - 2.5.5 PayPal
- 2.6 After Sales Service
- 2.7 E-commerce Security
  - 2.7.1 Digital Certificate
  - 2.7.2 SSL
- 2.8 Summary
- 2.9 Answers to Check Your Progress
- 2.10 Further Readings

---

### **2.0 INTRODUCTION**

---

E-commerce is growing at a record pace and many businesses are trying to setup store fronts in cyberspace and are targeting at selling stuff on the web. This unit introduces the ways of making your presence felt in cyberspace. The term E-commerce means using Internet for sale and purchase of goods, pre and after sale services and maintain long term relationships with customers. The basic elements required in e-commerce are:

e-commerce website, a server, users and proper Internet connection. To sustain in online business, any organization should concentrate on following primary features:

- Allow buyers to inquire about products, review products and service information, place orders, authorize payment, receive both goods and services online.
- Allow sellers to advertise products, receive orders, collect payments, deliver goods electronically, and provide ongoing customer support.
- Allow financial organizations to make and accept secured payment online.
- Allow sellers to notify logistics organization.

There are more features which are secondary in nature. They are given below.

- With the increase in wireless Internet technology, many online customers prefer to shop using their mobile devices than their desktops. To adapt to this change, experts have had to develop a more mobile responsive approach to brand website design.
- The longer the time web page takes to download, the higher the chances that the customers will leave the site. Thus a minimalist layout solves the problem of page load time.

Concentrate on trust building features like: Brand and merchants reputation, experience in the offline world, interface design and ease of navigation, use of native languages by the website, customer service contact numbers, links to trusted companies (for small or web based merchants), contractual terms and conditions, clear pricing (including delivery costs, taxes, etc.), clearly stated return policy (procedure, cost, reimbursement), ability to back-out of a transaction, variety of payment methods with different risk levels for consumers (cash on delivery, credit card, etc.), etc.

## 2.1 OBJECTIVES

After going through this unit, you should be able to

- learn the ways to increase visibility of your online business,
- know different ways to pay online,
- know the needs of e-shops,
- learn the delivery and after-sales issues related to e-commerce, and
- know the issues related to secure transactions.

## 2.2 E-VISIBILITY

Being able to stand out and getting customers is very challenging task in the ever growing global market when too many e-commerce sites are competing for the same target customers. The following are some of the strategies to increase e-visibility of your e-commerce website:

- **Increasing traffic:** It is essential for your site to regularly post on social networking sites. It is paramount to create and maintain your brand positioning in order to survive. It is essential to remember that anything out of sight of customer will be out of his/her mind. This can be improved by taking the following measures:
  - (i) Uploading contents like special offers, news, pictures, phrases, any eye catering information for the regular followers.
  - (ii) Knowledge about competitions, doing research and checking what the competitors are uploading, their offers and number of posts are they doing.
- **Easy URL:** The website URL must be simple and catchy so that can be easily remembered. At the same time, name should be sensible that it can be guessed and easily remembered by users.
- **Adding icons of social networks:** It helps user/followers and other potential customers to know about your site and business.
- **Advertising:** Word of mouth marketing is more powerful than ever but even the conventional way of advertising using media such as TV, newspapers, etc. In fact, they play significant role in increasing visibility. The consumers have always trusted recommendations and advice from friends and peers more than they do on brand advertisement. So taking advantage of the power of supporters of your brand can also be useful.
- **Social empire optimization:** It is a process of imposing the visibility of website in the search engine's search results. The higher appearance of your website in the search engine, the higher the probability of increase of number of customer .

The following are some of the techniques that need to be followed to improve visibility:

- Optimizing the contents of website.
- Including list of key words related to your work on all your pages.
- Using buttons of social networks on your website.

Search engines are classified into two categories.

- **Crawler based search engine:** These search engines called robot or bat, generally index sites based on the content and links to your website. Google and Alta vista are examples. The exact method of ranking the website by crawler based search engine is kept confidential as rules keep on changing with time.
- **Human powered directories:** These are actually compiled by human reviewers who examine and evaluate description of website and then they rate the contents using their own criteria. Normally, this type of combination is done for listing by paid search engines.
- **Link popularity:** Link popularity is a key factor for increasing ranking of web pages. It refers to the number and quality of links that point to website.

## 2.3 E-SHOP

E-shop is also referred to as e-website or virtual store. It allows the customers to purchase goods from various sellers using Internet. E-shop can be of any type (B2B, B2C, C2C) and size. The aim of e-shop is to provide a global, reliable, 24 × 7 web based effective sales management system. The e-shop interface has following features:

- **Product tree:** It helps users in finding necessary product(s).
- **Tables:** User can easily manage the table data such as sorting, filtering and viewing table data.

E-shop has several features to ensure that customer's e-commerce experience is comfortable and easy, efficient, dependable and secure. The following are some of the features a e-shop:

- **Ease of navigation:** Effective navigation is very important and critical for e-shops because lost visitors will result in lost sales. Large sites have huge range of products and have to be more careful as finding a product of choice is a big task. Sufficient user testing will be extremely useful for identifying potential navigational issues.
- **Shopping cart, login and search options:** An e-shop without these features is of no use. Many e-shops provide private accounts to customers so that they can check their order history. Also, such customers get special discount offers or can participate in different promotions or sale. Search options are essential for finding suitable products for customers by customers, specifically in large websites.
- **Deals, freebies and free shipping:** people generally tend to buy more during sales and discounted periods. Some are also attracted by free shipping. So making eye-catching banners with discount offers on the upper part of home page of e-shop website will lead to increase in sales.
- **Payment system Icons:** E-shops have many customers from round the globe and each have their own preferred payment system ranging from credit & debit card, gift vouchers and cash on delivery, etc. These options always display the delivery and after sales terms and conditions.
- **Links from social media:** Almost 30% of online purchases are accomplished after surfing through social media sites such as Twitter and

Face book. They are good options as customers are inclined by public opinion also.

- **Phone numbers and online chats:** The customer helpline numbers and online chat with customers to clear queries are highly appreciated forms of value added customer service since E-shops are working  $24 \times 7$  and customer service can solve majority of pre-sales and after sales questions.
- **Store finder:** This feature is useful and must for E-shops that have wide dealer network. Many international customers prefer to visit website to find nearest branch as well as for information but prefer to visit nearest store physically.
- **Trust marks:** Trust marks are small images or a logo that shows a security guarantee by an external party indicating that it is safe to shop onsite. Some of these trust marks come from Verisign, TRUSTe, McAfee, etc.

Apart from trust marks, a clear design, easy menu and submenus, detailed product descriptions and clear images of products along with user review are also very important to build reputation of E-shops.

## 2.4 DELIVERY OF GOODS AND SERVICES

Delivery of products bought online is very crucial and complex as multiple layers of contracts are involved. The delivery value chain may have the involvement of the following groups of stakeholders:

- **E-shoppers:** buy products and delivery services from e-retailers.
- **E-Retailers:** buy delivery services from delivery operators and logistics intermediaries.
- **Delivery operators:** operate in the intersections that exist between e-shoppers, e-retailers and delivery operators.

The most important aspects of delivery for e-shopper are:

- Low cost delivery.
- Delivery at home address.
- Access to electronic delivery notifications such as SMS, e-mail etc.
- Convenient return options.

The deliveries of goods or services depend on the size of products, its nature, urgency and the distance between the customers and retailer's warehouse. The following are some of the ways:

- **Home delivery:** The product is shipped to the address given by customer. The home delivery of products can be in the form of parcels or delivery by hand.
- **Content delivery as electronic delivery:** Also referred as online distributors, they deliver media content like audio, video, games, downloadable add-ons of other products. A lot of software is also sold online. It can be downloaded or may be streamed. Download enables storing the content on any storage media for faster access in future.
- **Drop shipping:** It is the way in which the retailers transfer the customer order and shipment details to either the manufacturer, distributor or whole sellers who then deliver the products directly to customers. This means that retailer does not have to keep goods in stock and saves time, money and space.

- **Collect your own:** Sometimes, traditional customers can't trust for timely delivery of products so they pay for the product online and select a local store using locator software and pick up the products from selected locations. This will save time as queues are avoided at checkout time.
- **Printing out:** Products like insurance policies, gift vouchers, tickets etc. can be e-mailed to customer and the print outs of products can be easily redeemed at appropriate online or physical stores.

#### ☛ Check Your Progress 1

- (1) Consumer service is usually not a problem for most electronic commerce sites. (T/F)
- (2) One of the best ways to accommodate a broad range of visitors needs is to build \_\_\_\_\_ into the website interface.

## 2.5 ONLINE PAYMENTS

The online electronic payment is the core of e-commerce and has revolutionized the business processing by reducing paper work, transaction costs, etc.

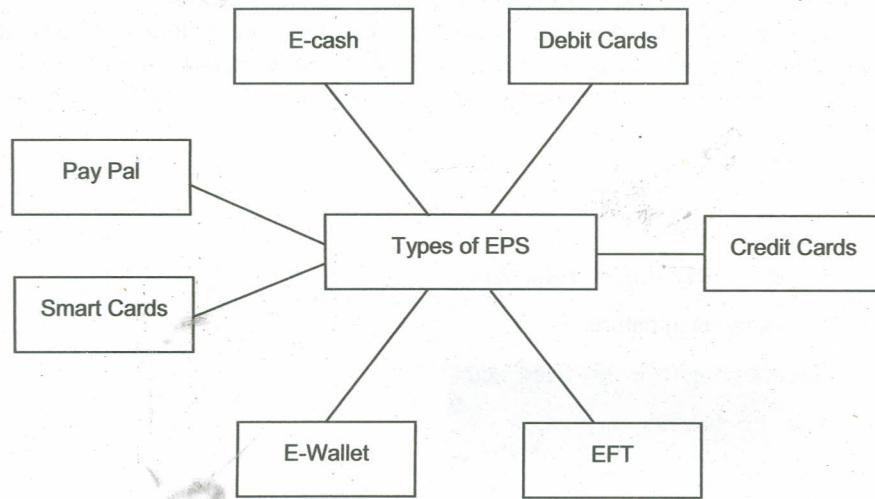


Figure 2.1: Types of Electronic Payment Systems

The following are some of the types of Electronic Payment Systems (EPS) (refer to Figure 2.1):

### 2.5.1 Credit Cards

This is one of the frequently used modes of payment used for purchases by Internet as it is the most convenient mode. But, it has spending limit based on users credit history.

#### Advantages

- Ease of use,
- Increased sales as credit card orders are generally bigger in nature,
- Secured than carrying cash, and
- Authentication is online. Thus, retailers are sure of payment.

#### Disadvantages

- Cost of credit card processing is more than cash payment in some cases,
- Phishing or Internet frauds pose a major security issue, and
- Peer to peer transaction is not possible.

### 2.5.2 Debit Cards

Debit cards are quite similar to credit cards which are issued to customers by banks. The major difference in debit card and credit card is that in case of debit card amount is immediately deducted from account as soon as transaction is done. Like credit cards, there is no restriction of spending limit in debit card.

#### Advantages

- Since amount is debited immediately from the corresponding account, chances of becoming bankrupt are less.

#### Disadvantages

- Debit card security is major task, theft of user pin is much easier,
- Debit cards are pay now option i.e. no grace period of paying your amount, and
- Sometime the extra processing charges are added when paying through debit cards.

### 2.5.3 Smart Cards or Stored Value Cards

Smart cards are also similar to credit and debit cards but they have additional microprocessor chip added to the plastic cards. This chip stores the customer details and digital cash value in it in encrypted form and can be accessed using customer PIN only. Smart cards are more secure and provide faster processing. Visa Cash card/Mondex cards are examples.

#### Advantages

- Atomic transactions,
- Good for very small transactions,
- Anonymous in nature,
- Security of physical storage, and
- It is currency neutral.

#### Disadvantages

- Due to lesser transaction limit, it is not suitable for B2B or B2C, and
- Due to high interface cost, it is not suitable for C2C.

### 2.5.4 EFT

EFT is the computer based system that transfers the money electronically from one account to another. Sometimes, it is also known as e-cheque. Interbank transfers are examples of EFT.

#### Advantages

- Scheduled electronic payment helps in managing delayed disbursements easily,
- The manual cheque involves the cost of ordering cheques, stamps, envelopes, visit to bank, etc. But, EFT reduces all such administrative costs. It requires less labor and simplifies reconciliation of bills,
- Money transfer is faster as transfer is normally done within 24 hours,
- It provides greater control to approve payment by using built in feature of segregation of duties. Only a password is required to issue payments, and
- Process is secure when compared to cheques as no issue of lost or stolen cheques arises.

**Disadvantages**

- It is limited to large companies,
- Risk is involved as the account number added may be incorrect sometimes, and
- The transactions are irreversible.

**2.5.5 PayPal**

This is also electronic payment system in which money is transferred between the accounts. It is analogous to net banking. To use PayPal, you have to open a PayPal account associated to your credit card or your bank account. However, a user can pay without giving the credit card number during the transaction. The following is the process of validating the account particulars:

- Customer gives PayPal account number,
- PayPal transfers small amount to the account,
- Customer confirms the payment amount,
- If correct, authentication is treated as successful, and
- PayPal sends email to both the payment sender and receiver of the transactions.

**Advantages**

- Easy to use, and
- No Credit card is required.

**2.6 AFTER SALES SERVICE**

Customer service is service given during and after sales. Poor or lack of service yields negative word of mouth advertising which in turn keeps people away from your business. The following steps can be taken to improve after sales service:

- **Make delivery procedure easy:** Flexible and convenient delivery methods or returning/exchange method always makes customer happy.
- **Send delivery notifications:** Sending e-mails and SMS about delivery gives a feel of personal touch to customers. Text in e-mail and SMS should be simple and easily manageable.
- **Loyalty counts:** Give increased benefits to customers who are regular for their loyalty.
- **Feedback:** Customer feedback AND service helps to analyze your own business loopholes and problems. This is useful to increase customer base.

**2.7 E-COMMERCE SECURITY**

The security in e-commerce is becoming more topical part in the ongoing success and growth. However, Internet is an open communications network and anyone can exploit its vulnerabilities for fraudulent gain. If the Internet is to succeed as a business and communications tool, then the security is the most fundamental issue that needs to be taken care of. The following are some of the security features that can be implemented for success of e-commerce:

- **Identification or Authentication:** The persons/entities with whom we are communicating are really who they say they are.

- **Confidentiality:** The content of the message or transaction is kept confidential. It should only be read and understood by the intended sender and receiver.
- **Integrity:** The content of the message or transaction is not tampered accidentally or deliberately.
- **Non-Repudiation:** The sender and receiver cannot deny sending and receiving of the message or transaction respectively.
- **Access Control:** Access to the protected information is only realized by the intended person or entity.

There are two levels for securing information over the Internet:

- The first level is issue of a Digital certificate. Digital certificates provide a means of proving your identity in electronic transactions; much like a driving license or a passport. With a Digital certificate, you can assure friends, business associates, and online services that the electronic information they receive from you is authentic.
- The second level is SSL (Secure Sockets Layer). SSL is a standard security technology that helps in establishing an encrypted link between the server and the client – typically a web server (e-commerce website) and a browser (consumer side). SSL allows client/server applications to exchange sensitive information such as credit card numbers and login credentials securely preventing others from eavesdropping, tampering or forging the information.

### 2.7.1 Digital Certificates

Digital certificates are electronic files that are used to uniquely identify people and resources over the Internet. They enable secure, confidential communications between two parties. Digital certificates are issued by CA (Certifying Authorities), such as VeriSign or Entrust Technologies. A CA is a trusted entity whose main responsibility is certifying the authenticity of users. There are four types of certificates available:

- **Server Certificates:** These types of certificates are used by web servers to identify the company running the server and to allow encrypted SSL sessions and SET (Secure Electronic Transaction) processing.
- **Personal Certificates:** These certificates are for individuals who want to send S/MIME messages and access web servers using SSL and SET.
- **Publisher Certificates:** These are used by software authors to sign and identify their release codes so that users will know of tampering, if it happens.
- **Certificate Information:** All digital certificates include information about its owner and the CA who issued it. A digital certificate includes the following information: Name of the certificate holder and other identifying information unique to the holder such as URL or e-mail address, holder's public key, name of the CA who issued the certificate, serial number of certificate and validity period of the certificate (start and end date).

### Public Key Cryptography

Digital certificates are based on public key cryptography, which uses a pair of keys for both encryption and decryption. With public key cryptography, keys work in pairs of matched "public" and "private" keys. The public key can be freely distributed without compromising the private key, which must be kept by its owner. Since these keys only work as a pair, an transaction done with confidential public key can only be undone with the corresponding private key, and vice-versa.

## 2.7.2 SSL

SSL allows the client and server to communicate with each other in a way that prevents the tampering of data that is being transmitted. SSL requires all information sent between a client and a server be encrypted (by the server) when sent and decrypted (by the client) when received. SSL also has the ability to detect any tampering of data. SSL certificates are available in two strengths: 40-bit encryption and 128-bit encryption. The higher the bit number, the more difficult it is to break the encryption code.

Figure 2.2 depicts the working of SSL.

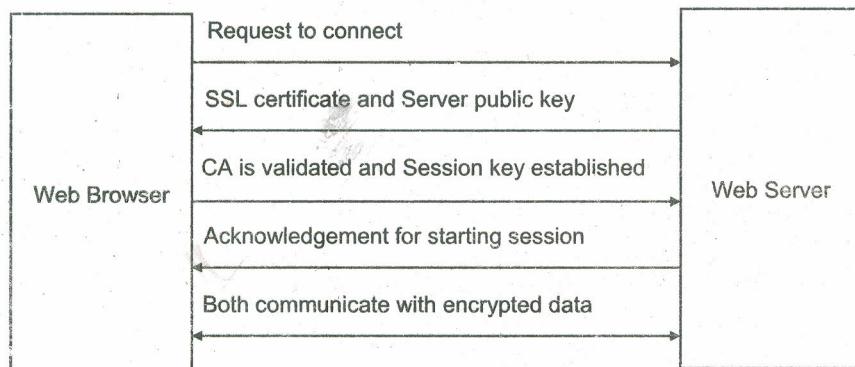


Figure 2.2: Working of SSL

### Check Your Progress 2

- (1) A digital signature is \_\_\_\_\_.
- (2) The concept of electronic cash is to execute payment \_\_\_\_\_.
- (3) What is public key encryption system?

## 2.8 SUMMARY

This unit discussed the facilities which any e-shop should have and the strategies it should follow to increase customer-base and sustain the e-business round the globe. To increase and sustain in e-business, the organizations are required to focus on issues like payment methods, customer care, ease of navigation, etc. This unit also discussed about the security of transactions in e-commerce.

## 2.9 ANSWERS TO CHECK YOUR PROGRESS

### Check Your Progress 1

- (1) False
- (2) Flexibility

### Check Your Progress 2

- (1) Encrypted information.
- (2) Over networks.

## 2.10 FURTHER READINGS

### References

1. *E-commerce: Strategy, Technologies and Applications*; David Whiteley; Tata McGraw Hill.
2. *Electronic Commerce: from vision to Fulfillment*, Elias M. Awad; PHI; 2006.
3. <http://www.wikipedia.org>

# **UNIT 3 ELECTRONIC DATA INTERCHANGE AND ELECTRONIC PAYMENT SYSTEMS**

---

## **Structure**

- 3.0 Introduction
- 3.1 Objectives
- 3.2 Architecture of EDI
- 3.3 EDI Technology and Standards
  - 3.3.1 ANSI X12
  - 3.3.2 EDIFACT
- 3.4 Benefits and Applications of EDI
- 3.5 Electronic Payment Systems
  - 3.5.1 Credit/Debit/Smart Cards
  - 3.5.2 E-credit Accounts
  - 3.5.3 E-money
- 3.6 Summary
- 3.7 Answers to Check Your Progress
- 3.8 Further Readings

---

## **3.0 INTRODUCTION**

---

This unit provides insights into Electronic Data Interchange (EDI) and Electronic Payment Systems (EPS).

Basically an EDI is a structured, machine readable document used in business exchanges. Employing EDIs in business functions would reduce the overall transaction time and automates the process. Some of the examples of EDI include purchase orders, sales orders, invoices, bills etc. EDIs are pre-dominantly used in B2B scenario.

### **EDI based Business Function**

Consider the following conventional B2B scenario.

A manufacturing company generates a purchase order (PO) of materials it wants to purchase from a business partner. The PO is typically generated using internal systems including the inventory control systems, pricing systems and others. The manufacturing company then transfers PO to the partner via fax or mail. The business partner then would use its own internal systems to translate the items in PO complying with its internal standards. After this translation and processing, the PO transaction is finalized. Sequence of steps is depicted below in Figure 3.1.

A sample business flow for generating and receiving PO without EDI is shown in Figure 3.1.

Bringing EDI into picture eliminates five steps in the above process right away. Modified business function with EDI is shown in Figure 3.2.

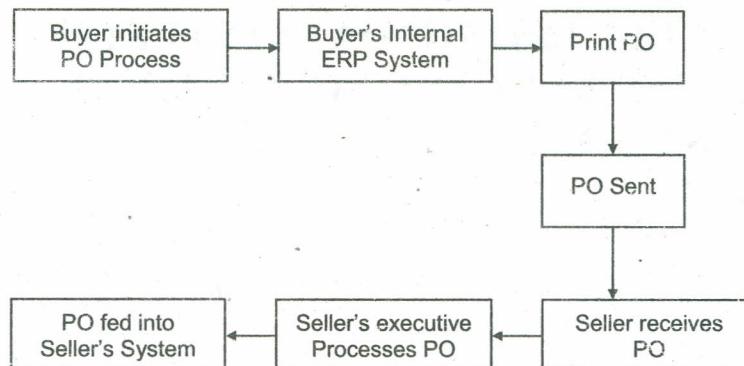


Figure 3.1 : Conventional Processing of PO

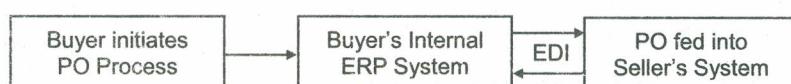


Figure 3.2: Processing of PO in the era of EDI

As we can see from the process flow in Figure 3.1, there are certain manual steps such as company synchronizing with internal systems, partner translating/processing PO which is potentially causing delays in the overall process. When EDI is used, the complete process can be automated and the structured information can be exchanged between systems belonging to manufacturing company and its business partner.

### Characteristics of EDI

The main characteristics of EDI include the following:

- Provides structured and standardized format for business transactions such as purchase orders, sales orders, bills etc.,
- Provides electronic exchanges of data automatically,
- Automates most of the business transactions, and
- Drastic reduction of manual errors in overall transactions and business process.

---

## 3.1 OBJECTIVES

---

After going through this unit, you should be able to know

- key concepts of EDI,
- various standards and format of EDI,
- layered architecture of EDI,
- electronic payment systems, and
- concepts related to credit card, debit card, e-money and e-credit.

---

## 3.2 ARCHITECTURE OF EDI

---

This section elaborates the concepts of EDI with few scenarios and examples. According to National Institute of Standards and Technology (NIST) *EDI may be defined as a computer-to-computer interchange of strictly formatted messages that represent documents other than monetary instruments.*

It is important to note that EDI is between computers without manual intervention and hence the term *computer-to-computer* is used in the definition. Similarly, *strictly formatted message* indicates conformance to industry-wide standards.

EDI layered architecture essentially consists of four main layers as shown in Figure 3.3:

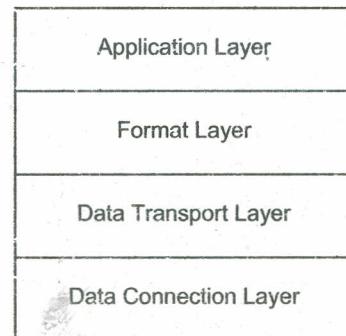


Figure 3.3: EDI Layered Architecture

The four layers form the basic building blocks of EDI. They are introduced below:

- **Application Layer:** This layer consists of business applications which use the EDI. The applications can be internal enterprise systems and other B2B systems. The main responsibility of these applications is to convert the internal documents of company in electronic format to the standard format supported by EDI system. So, these applications act as converters in application Layer.
- **Format Layer:** This layer processes the documents in EDI formats. Two popular industry wide EDI standard formats are ANSI X12 and EDIFACT (Electronics Data Interchange for Administration, Commerce and Transport). More about these standard formats are discussed elsewhere in this unit.
- **Data Transport Layer:** This layer is responsible for automatically transferring the EDI. Though e-mail is a popular format of data exchange, there are other transportation mechanisms such as FTP, HTTP, HTTPS and X.435, etc.
- **Data Connection Layer:** This layer consists of enterprise network infrastructure which is used to transport data. This includes dial-up/modem based connections, Internet, point-to-point communication etc. Other popular format for network infrastructure includes employing of a Value Added Network (VAN) which provides an EDI account and store-and-forward mailbox for subscribers.

### 3.3 EDI TECHNOLOGY AND STANDARDS

Though there are multiple EDI standards, we will look into two popular standards in this section. In addition, there are other standards such as TRADACOMS (Trading Data Communications), ODETTE (Organization for Data Exchange by Tele Transmission in Europe), VDA (Verband Der Automobilindustrie), SWIFT (Society for Worldwide Interbank Financial Telecommunication) which are used in particular geographies and industries.

#### 3.3.1 ANSI X12

ANSI X12 is most popular in North American region. It defines standards for various business transactions such as order processing, material handling, warehousing services, manufacturing services, etc. X12 standard uses *transaction set* to identify each business transaction and each transaction set is denoted by a numeric code.

Figure 3.4 depicts a sample X12 compliant EDI document for PO transaction:

```

ISA*00* *00* *02*1234750000 *04*1234567890 *020627*1304*U*00401*000001403*0*P*>~
GS*PO*1239721193*1234567890*12330627*1204*1403*X*123010~
ST*850*12303001~
BEG*00*SA*123177**20030627~
REF*AN*123494~
PER*BD*SAMPLE NAME*TE*1232225555~
FOB*PB~
DTM*123*12330705~
DTM*123*12330704~
PKG*****01~
TDS*****H*OUR CR/T~
N9*AH*123177~
MSG*THIS PURCHASE ORDER IS SUBJECT TO THE SAME TERMS AND~
MSG*CONDITIONS AS PURCHASE ORDER FORM 1030~
MSG*PICKUP NO. E123362~
N1*ST*ABC INC*9*1231372092527~
N2*Tracy Produce~
N3*12300 NW Road~
N4*SAMPLE*AB*12376~
N1*BT*SAPLE INC*9*1231372091700~
N2*NATIONAL SERVICES CENTER~
N3*P.O. BOX 12393~
N4*SAMPLE*AZ*12338~
N1*VN*SAMPLE.*9*1234567890000~
N3*P.O. BOX 11111~
N4*SAMPLE*CA*90001~
PO1**10*CA*12.5***UA*123040304101*IN*12303041*VN*22222~
CTP*RS*FCP*12.5~
PID*F*08***ITEM DESCRIPTION 1/10 LB~
SAC*A*B280***20.00***2.00***02~
CTT*1**120*LB~
SE*30*01403001~
GE*1*1403~
IEA*1*000001403~

```

Figure 3.4: A Sample X12 Compliant EDI Document

### 3.3.2 EDIFACT

EDIFACT is an EDI standard format developed under UN (United Nations). Hence, EDIFACT is also denoted as UN/EDIFACT.

This is the international standard which consists of the following four key elements:

- Syntax which defines the message structure
- Data elements within the document
- Segments which groups the date elements
- Messages which are an ordered group of segments and symbolize a business transaction

Figure 3.5 depicts a sample EDIFACT compliant EDI document.

```
UNB+UNOA:1+123435656:1+123415160:1+123515:1234+000000000000778
UNH+1230000000117+INVOIC:D:97B:UN'
BGM+123+342459+9
DTM+3:12360515:102
RFF+ON:123052
NAD+BY+123820524:16++SAMPLE MID-RANGE ENGINE PLANT
NAD+SE+123435656:16++GENERAL WIDGET COMPANY
CUX+1:USD'
LIN+1++123870:IN'
IMD+F++:::WIDGET'
QTY+47:1230:EA'
ALI+US'
MOA+123:1232.58'
PRI+INV:1.179
LIN+2++123871:IN'
IMD+F++:::DIFFERENT WIDGET'
QTY+47:20:EA'
ALI+JP'
MOA+123:410
PRI+INV:20.5
UNS+S'
MDA+39:1237.58'
ALC+C+ABG'
MOA+8:525
UNT+23+0000000000117
UNZ+1+000000000000778
```

Figure 3.5: EDIFACT Compliant EDI Document

### 3.4 BENEFITS AND APPLICATIONS OF EDI

The following are the key benefits of using EDI:

- Minimizes the manual work and redundancy in exchange of business documents,
- Automates the business exchange transactions,
- Optimizes the lead times for inventory,
- Contributes directly to increased sales and revenue due to increased cooperation,
- Reduced time in all business transactions such as PO generation, and
- Better customer service due to improved turnaround times.

EDI is applied in wide variety of business domains such as e-commerce, logistics, retail, healthcare etc.

Some of the industry specific applications of EDI are given below:

- EDI is used by educational institutions to exchange student information,
- HIPAA (Health Insurance Portability and Accountability Act) standard in healthcare requires EDI,

- Automotive industry uses EDI for streamlining operations with suppliers and vendors,
- Retail players use EDI to streamline their procurement processes, and
- Manufacturing firms use EDI for product purchases and interaction with resellers.

**☛ Check Your Progress 1**

- (1) The layer which converts application specific format into EDI standard is \_\_\_\_\_.
- (2) ANSI X12 standard uses \_\_\_\_\_ to identify business transaction.
- (3) \_\_\_\_\_ group data elements in EDIFACT compliant EDI document.

## 3.5 ELECTRONIC PAYMENT SYSTEMS

Electronic payment systems (EPS) are an application of EDI which provides a system for electronic payment and transactions. EPS facilitate a commerce transaction electronically by allowing the buyer to pay online. EPS are hugely popular among (B2C) transactions. They enjoy unique benefits such as wider reach to customers, support to numerous modes of electronic payments, and decreased transaction costs. Due to its ease-of-use, vast majority of E-commerce platforms employ EPS to facilitate the sale of their products. EPS are employed in numerous online financial transactions such as online shopping, utility bill payments done online etc. Numerous digital financial instruments are used in EPS such as credit/debit cards, smart cards, e-cash etc. We will look into them in next section.

### 3.5.1 Credit/Debit/Smart Cards

- Credit card is the most popular way of performing online transactions. The cards are identified by 16 digit number and have a maximum limit on spending. Buyers need to enter card information such as number, CVV (Card Verification Value) code, and expiry date etc. to authenticate the transaction. Most popular credit card networks employ additional layer of security such as OTP (One-time password) or security code to verify the authenticity of the card holder. Major players in credit card business are Visa, Master card and American Express.
- Unlike credit cards, debit cards are linked to user's bank accounts and they can use their debit cards as one of the channels to use their account. Often online banking or net banking rules apply while using debit cards.
- Smart cards have built-in integrated circuits and act as electronic wallet for the users. They can be pre-loaded with tokens or funds and they can be used to make electronic and physical payments similar to debit cards.

The following is a typical flow of transaction when credit/debit/smart cards are used:

- i) Buyer selects the product he/she wants to purchase.
- ii) E-commerce system redirects the user to the payment gateway which provides options to make online payment through various means. Often, payment gateways are accessed on secure HTTPS channels.
- iii) Buyer selects the mode of payment (credit/debit/net banking) at payment gateway.
- iv) Payment gateway redirects the user to the page specific to mode of payment selected.
- v) Buyers enter the required details of digital financial instrument. Payment.
- vi) Gateways process the transaction and upon successful authentication, money will be transferred to merchant's bank.

### 3.5.2 E-credit Accounts

E-credit account allows an online business transaction to happen. Typically, B2B business transactions use e-credit accounts. Companies offering e-credit facilities offer a higher end credit limit and a fixed repayment time period. E-credit account is mainly used for large financial transactions without any physical presence. Sometimes, these accounts are issued by credit card companies and are linked to customer's credit card account for making virtual payments. Few companies like <http://www.alibaba.com> permit e-credit for overseas buyers to boost trade. The idea of e-credit is fundamentally same as that of credit card except that user does not have a physical device for the account. Account holder will be given a credit limit for the transaction and once the transaction is made, account holder needs to pay back the money within stipulated time period.

### 3.5.3 E-money

E-money or digital cash is the financial instrument stored in computer systems and can be example used for online transactions. They are electronic counter parts or representatives of physical cash. For example, bit coins or EFT is referred to as e-money. Various cryptographic methods such as public-private key encryption, digital signatures are used to authenticate and authorize the usage of e-money.

Currently e-money is used to indicate wide variety of things such as money stored in e-wallet, money transferred via mobile devices, digital currency used in online payment systems, and money stored in smart cards.

The following are some of the scenarios where e-money is currently being used:

- Facilitate travel in public transport system using wireless payment, and
- Electronic pre-paid cards for various online transactions.

The ecosystem for e-money is still evolving and challenges such as security, prevention of double spending etc. needs are to be addressed.

#### ☛ Check Your Progress 2

- (1) Debit cards are linked to \_\_\_\_\_.
- (2) Wireless payment is facilitated by \_\_\_\_\_.
- (3) E-credit accounts are sometimes linked to user's \_\_\_\_\_.

## 3.6 SUMMARY

In this unit, we started by understanding how EDI enables various business functions by reducing manual effort. We also looked at the characteristics of EDI. In further sections, we looked at the definition of EDI and various building blocks of EDI in the layered architecture. We then looked at two popular EDI standards, namely, ANSI X12 and EDIFACT with sample files for each of them. In the subsequent sections, we focused on EPS and various tools used for electronic payment such as credit cards, debit cards, e-credit accounts and e-money etc.

## 3.7 ANSWERS TO CHECK YOUR PROGRESS

#### Check Your Progress 1

- (1) Application Layer
- (2) Transaction set
- (3) Segments

### Check Your Progress 2

- (1) User's bank account.
- (2) E-money
- (3) Credit and account.

---

## 3.8 FURTHER READINGS

---

### References

1. *Demystifying EDI* by Russell A. Stultz; Wordware Publishing Inc.; 2000.
2. *Electronic Commerce* by Gary Schneider; Cengage Learning; 2012.
3. [http://en.wikipedia.org/wiki/Electronic\\_data\\_interchange](http://en.wikipedia.org/wiki/Electronic_data_interchange)
4. [http://en.wikipedia.org/wiki/X12\\_Document\\_List](http://en.wikipedia.org/wiki/X12_Document_List)
5. <http://www.x12.org/>
6. [http://en.wikipedia.org/wiki/E-commerce\\_payment\\_system](http://en.wikipedia.org/wiki/E-commerce_payment_system)
7. [http://en.wikipedia.org/wiki/Electronic\\_money](http://en.wikipedia.org/wiki/Electronic_money)
8. <http://www.ledisource.com/>

## **UNIT 4 INTRODUCTION TO E-COMMERCE MODELS**

---

### **Structure**

- 4.0 Introduction
- 4.1 Objectives
- 4.2 Inter-organization and Intra-organization E-commerce
- 4.3 Models of E-commerce
  - 4.3.1 B2B
  - 4.3.2 B2C
  - 4.3.3 C2C
  - 4.3.4 C2B
  - 4.3.5 B2G
  - 4.3.6 G2B
  - 4.3.7 G2C
- 4.4 Summary
- 4.5 Further Readings

### **4.0 INTRODUCTION**

---

This unit introduces models of e-commerce. Any exchange of commodity made through electronic medium is called e-commerce. E-commerce is available to the user through EFT, supply chain management, Internet marketing, online transaction processing, EDI, inventory management systems, and automated data collection systems. Modern e-commerce typically uses the World Wide Web. E-commerce and e-business are interrelated. Through e-commerce, technology enabled and technology mediated transactions happen.

### **4.1 OBJECTIVES**

---

After going through this unit, you should be able to know about

- inter and Intra-organizational e-commerce, and
- models of e-commerce.

### **4.2 INTER-ORGANIZATION AND INTRA-ORGANIZATION E-COMMERCE**

---

When e-commerce transaction involves multiple organizations, then it is termed as Inter- organizational e-commerce. When e-commerce transaction does not involve multiple organizations, then, it is termed as Intra-organizational e-commerce.

### **4.3 MODELS OF E-COMMERCE**

---

Various e-commerce models are given below:

- Business to Business (B2B),
- Business to Consumer (B2C),
- Consumer to Consumer (C2C),

- Consumer to Business (C2B),
- Business to Government (B2G),
- Government to Business (G2B),
- Government to Citizen (G2C), and
- Citizen to Government (C2G).

#### 4.3.1 B2B

In B2B e-commerce model (Figure 4.1), the transactions are between businesses. An example of such transaction is between wholesaler and retailer. Examples of B2B portals include <http://www.infobanc.com>, <http://www.ask4plastic.com>, <http://www.matexnet.com>, <http://www.pcbindia.com>, <http://www.plastemart.com>, and <http://www.vistaar.com>.

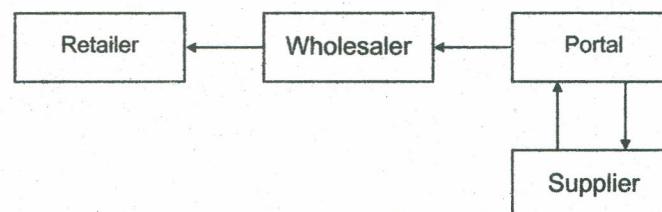


Figure 4.1: B2B Model

#### 4.3.2 B2C

In B2C e-commerce model (Figure 4.2), the transactions are between businesses and consumers. An example of such transaction is between Indian Railways and Passenger. Examples of B2C portals include <http://www.irctc.co.in>, <http://www.amazon.com>, and <http://www.tatasky.com>.

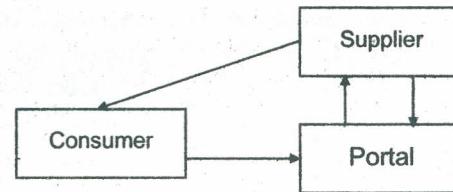


Figure 4.2: B2C Model

#### 4.3.3 C2C

In C2C e-commerce model (Figure 4.3), the transactions are between consumers and consumers. An example of such transaction is between sellers and buyers of shares. In C2C model, organizations may be present as intermediaries. Examples of C2C portals include <http://www.olx.in>, and <http://www.quickr.com>.

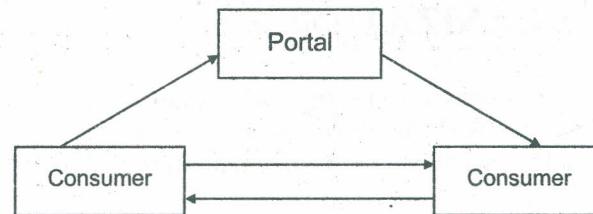


Figure 4.3: C2C Model

#### 4.3.4 C2B

In C2B e-commerce model (Figure 4.4), a consumer approaches website showing multiple business organizations for a particular service. Consumer may place an estimate of amount s/he wants to spend for a particular service. Interest rates of personal loan/ car loan provided by various banks via website is an example. Business organization which

fulfills the consumer's requirement within specified budget approaches the customer and provides its services.

Examples of C2B portals include <http://www.razerfinish.com>, <http://www.reverseauction.com> and <http://www.priceline.com>

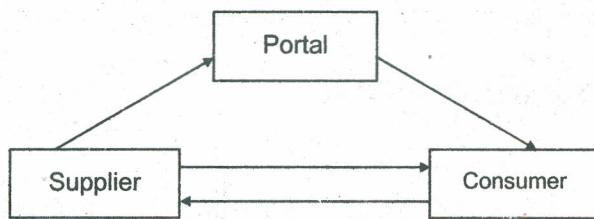


Figure 4.4: C2B Model

#### 4.3.5 B2G

B2G model (Figure 4.5) is a variant of B2B model. Such websites are used by Government to trade and exchange information with various business organizations. Such websites are accredited by the Government and provide a medium to businesses to submit applications to the Government. This type of transaction is more or less similar to B2B.

An example of B2G portal is <http://www.lockheedmartin.com>.



Figure 4.5: B2G Model

#### 4.3.6 G2B

Government uses G2B model (Figure 4.6) to approach business organizations. Such websites support auctions, tenders and other functionalities such as submission of application forms, etc.

An example of G2B portal is <http://www.dti.gov.uk>.

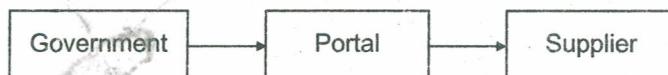


Figure 4.6: G2B Model

#### 4.3.7 G2C

Government uses G2C model (Figure 4.7) to approach citizens in general. Such portals may support auctions of vehicles, machinery or any other material. Such portal also provides services like registration of birth, marriage or death, etc. One of the main objectives of a G2C portal is to reduce time for performing various government services.

An example of G2C portal is <http://www.incometaxindia.gov.in>.

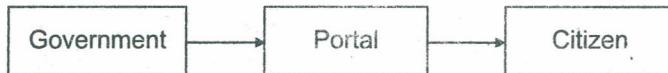


Figure 4.7: G2C Model

#### Check Your Progress 1

- (1) What is meant by Inter Organizational e-commerce? How does it differ from Intra Organizational e-commerce? Give examples.
- (2) Give examples of various models of e-commerce. (Don't repeat the same examples that are given in the unit.)

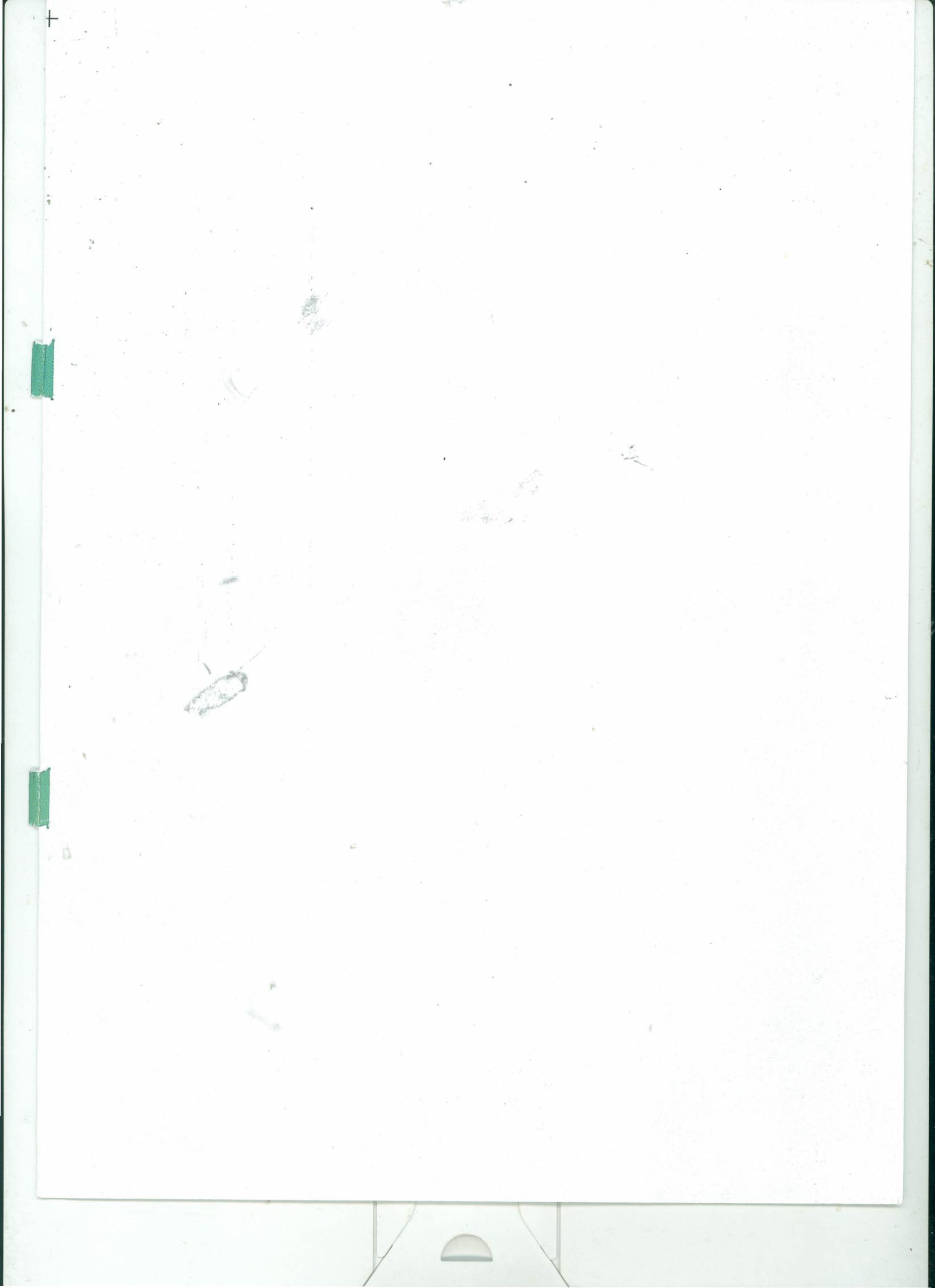
## 4.4 SUMMARY

E-commerce is growing rapidly. More and more transactions are being offered in e-commerce mode. In this unit, inter-organizational and intra-organizational e-commerce were introduced. Also, various models of e-commerce were introduced.

## 4.5 FURTHER READINGS

### References

1. *Introduction to Electronic Commerce* by Efraim Turban, David King and Judy Lang; Prentice Hall; 2008.
2. *The Complete E-commerce Book: Design, Build and Maintain a Successful Web-based Business* by Janice Reynolds; CRC Press; 2004.
3. [http://www.tutorialspoint.com/e\\_commerce/e\\_commerce\\_business\\_models.htm](http://www.tutorialspoint.com/e_commerce/e_commerce_business_models.htm)
4. <http://en.wikipedia.org>
5. <http://wiki.answers.com>



MPDD/IGNOU/P.O. 3.5T/October, 2014 (Reprint)

**ISBN: 978-81-266-6669-0**