Communication

E-COMMERCE AND INFORMATION TECHNOLOGY ACT, 2000

*Sunil Kr. Gandhi**

ABSTRACT

The communication deals with E-Commerce in the backdrop of Information Technology Act, 2000.

1. Introduction

In the last decade of twentieth century, we heard a hue & cry about E-Commerce. Experts estimated that in future E-Commerce transactions would overtake conventional transactions throughout the world. A vast employment opportunity of E-Commerce-personnel was also expected. In commensurate with the actions of other countries, Govt. of India enacted Information Technology Act, 2000 to facilitate E-Commerce transactions, inter alia other objectives. University Grant Commission (UGC) in its model syllabus (2001) suggested that B.Com. (E-Commerce) and M.Com.(E-Commerce) may be introduced by the Colleges/Universities.

This new area is a deviation from our conventional subjects since it involves some technicalities. Yet it is we, who will have to adopt this subject. The UGC model curriculum (2001) for commerce courses emphasizes the same point.

2. E-Commerce Concept

In a broad sense Electronic Commerce (E-Commerce) includes not only Internet commerce but also transactions through other electronic medium. In other words it can be described as-

(1) transaction between a company and its customers i.e. buying and selling of goods, services and information (including after-sale service and support);

*Reader, Dept. of Commerce, University of Kalyani, Kalyani, West Bengal.

(2) exchange of structured busines information between two or more companies, e.g. Electronic Data Interchange (EDI); and

(3) internal commerce involving work flow reengineering, product and service customization, Supply Chain Management (SCM) etc; by using electronic devices.

Electronic devices used for E-Commerce are – (i) Bar Code Machines, (ii) Vending Machines, (iii) Telephone & Telegraphs (iv) Fax (v) Television (vi) Stand alone Computers (vii) Computer Network (viii) Internet, WWW & E-mail.

When Internet is used as the medium of transaction, it is called *Internet Commerce (I-Commerce).* At present the words E-Commerce and I-Commerce have become synonymous. It is because the concept of E-Commerce became popular only during the Internet era, although it was in practice for decades. In future, with the convergence of communication technologies, E-Commerce can be accomplished through any of the networks that make up the Information Superhighway (I-way).

3. Types of E-Commerce

3.1. One way of classifying E-Commerce is based on parties involved in the transaction. Major types are mentioned below:

- Business to Customers (B2C)

- Business to Business (B2B)

- Government to Business (G2B)

- Government to Citizens (G2C)

- Academic Institutions to Students (AI2S)

The name of a type indicates the parties involved in that type of E-Commerce transactions. It may be noted that this list is not exhaustive.

3.2. Other way of classifying E-Commerce is based on whether Internet is used or other electronic devices are used for transactions. On this basis we can classify them as (a) Non-Internet Based E-Commerce, and (b) Internet Based E-Commerce. Discussion on these follows:

3.2.1. Non-Internet Based E-Commerce

There are many electronic devices, other than Internet, which are used for the purpose of E-Commerce. For example (i) Bar-Code Machines, (ii) Vending Machines, (iii) Telephone & Telegraphs (iv) Fax (v) Television (vi) Stand alone Computers (vii) Computer Network etc. Transactions made through the devices mentioned here, are easy to understand except the use of Computer Network for Electronic Data Interchange (EDI). A discussion on EDI follows.

Electronic Data Interchange (EDI)- This is a business-to-business (B2B) type of E-Commerce. EDI is the computer-to-computer exchange of structured business information in standard electronic format. Information stored in one computer is translated by software programs into standard EDI format for transmission to one or more trading partners. Trading partner's computer, in turn, translates the information using software programs into a form they can understand. There is no human involvement in the processing of the information. EDI was developed in the 1960s. However only in the 1980s, wide range of industries started using this technique.

Organizations adopting JIT (Just In Time) purchasing, may be much benefited if they adopt EDI. With the help of EDI, the supplier constantly gets information of stock position of the customer(s) on line. On the basis of such information the supplier can supply goods just in time. Let us suppose that a chicken farm has many outlets in a city, which sells varieties of chicken based products. If the main office has a computer network with EDI facility with its outlets, it can easily monitor stock position of the outlets. Whenever stock position of a particular item in an outlet reaches reorder level, the main office computer will automatically initiate the reorder process. Thus it reduces time and expense of paperwork.

Besides this, EDI is also used in international trade, electronic fund transfer (EFT) between supplier and customer via banker, insurance claim settlement etc. If properly used, EDI can save a substantial amount of cost involved in transaction processing.

Supply Chain Management (SCM)- As a part of internal E-commerce, Supply Chain Management is a landmark concept in inventory management. JIT

inventory management is no doubt beneficial but still it is only a part of the overall Supply Chain Management. On the other hand SCM is an integrated approach which involves- supplier management, inventory management, distribution management and payment management. SCM considers that instead of treating these as separate functions, a holistic view is needed. Organisations are experiencing that if they have to respond to the needs of the fast changing world; cross function integration and use of information & communication technology is a must. All the functions in SCM are done electronically. SCM software solutions are also available in the market.

3.2.2. Internet Based E-Commerce (I-Commerce)

By Internet Commerce we mean the use of the global Internet and World Wide Web (WWW) for commerce. With the advent of Internet & Website (World Wide Web), being the all-pervasive communication tools, scope of E-Commerce has increased manifold. At present it is the most powerful *distribution channel* amongst all the channels. For these reasons the term I-Commerce has become synonymous with the term E-Commerce. In the forthcoming paragraphs, we will use these two terms alternatively. In this context a basic idea about E-Commerce website is essential.

E-Commerce websites- If Internet is viewed as Information Highway (I-way), then websites are information storehouses located on the highway. Websites must be developed and hosted on the Internet. Then only it will be accessible from any part of the world. All websites do not have the facility of E-Commerce. For E-Commerce facility, a special type of website has to developed called E-Commerce websites. These websites enable online advertisement, online supply of information about the product/service, online placement of order, online supply of order (in case of digital products only), online billing, and also online payment for the product/service through credit card/debit card.

Major Advantages of I-Commerce

a) <u>Easy access to global market</u>- Through Internet, a seller can reach all the customers in the world simultaneously cutting across the geographical and time barrier. Of course there must be Internet facility at the customer's end.

b) <u>Reduction in distribution costs</u>- It establishes direct link between the customers and the suppler. Commission paid to middlemen is done away with.

Moreover, cost of documentation, transportation cost (in case of digital products only) and cost of collection from customers are negligible.

c) <u>Time saving</u>- A transaction can be completed in a few seconds without physically reaching out to the customer. Moreover there is no office hour in case of I-Commerce transactions. A customer also need not visit the place of the supplier. He/she can make transaction seating in his/her home/office.

d) <u>Building customer relationship</u>- For business success, building long term relation with the customers is a must. Internet is a good medium to build this relationship. Regular feedback from the customers can easily be obtained with the help of e-mail. After sales service becomes easy through Internet.

I-Commerce Value Chain

Value chain means a chain of adding value to the product. 'Total Value Chain' consists of adding value in each stage starting from processing of raw material to after sales service. I-Commerce value chain is a part of the 'Total Value Chain', which starts from advertising. It is mentioned below:

$$\boxed{\textbf{Attract}} \rightarrow \boxed{\textbf{Interact}} \rightarrow \boxed{\textbf{Act}} \rightarrow \boxed{\textbf{React}}$$

Attract involves attraction of customers through sales promotion

Interact involves negotiation with prospective customers

Act involves order processing, delivery & realization of payments

React involves after sales service on the basis of feed back from customers.

4. Network Security

Network in general and the Internet in particular suffers from severe security risk. Therefore, for proper functioning of E-Commerce, security is of prime importance. Only known and reliable customers/business partners are to be allowed access to database in case of EDI. On the other hand, if the I-commerce transaction is on credit, only a genuine customer's order is to be processed. To ensure this, mechanisms like data encryption using various cryptographic methods, digital signature, password, encrypted Smart Card, bio-matrices, firewall etc. are used. The Information Technology Act, 2000 has defined digital signature in Section 2(1)(p) and has made detail provision in Section 3 of the Act.

5. Electronic Payment System

In I-commerce, customers are generally unknown and may be from any part of the world. Naturally payments are to be ensured first before delivery of goods and services. Payments are made through Electronic Fund Transfer (EFT). Electronic payment may be made through Debit Card, Credit Card, Electronic Cash, and Electronic Cheques etc. Electronic Payment System is not free from risk. Only a well designed electronic payment system can minimize the risk. Other problems associated with payments are currency and taxation issues.

6. Information Technology Act, 2000

6.1. Background of Information Technology Act, 2000

♦ United Nations Commission on International Trade Law (UNCITRAL) adopted a <u>model law on Electronic Commerce</u> in 1996.

♦ The United Nations in 1997 recommended that all member countries should give favourable consideration to that model law.

♦ In India the Information Technology Act was passed in 2000, based on the model law. Date of commencement of the Act- 17.10.2000. It is a landmark Act in the direction of boosting E-commerce in India.

6.2. Salient Features

1. The Act simultaneously amended the following Acts-

    # The Indian Penal Code Act, 1860;

    # The Indian Evidence Act, 1872;

    # The Reserve Bank of India Act, 1934;

    # The Banker's Book Evidence Act, 1891.

2. Gave legal recognition to electronic records (Section 4 of the Act)

3. Gave legal recognition to digital signatures (Section 5 of the Act)

4. Provided for Certifying Authorities and Subscribers in connection with digital signature (Section 17 to 42 of the Act)

5. Made provision for penalties for cyber offences (Section 43 to 47 of the Act)

6. Established Cyber Appellate Tribunal (Section 48 to 64 of the Act)

7. Listed cyber offences (Section 65 to 78 of the Act).

6.3. Digital Signature

Role of digital signature in E-Commerce security system is highly important. For this reason the Information Technology Act, 2000 has made detailed provision on digital signature.

Section 2(1)(p) of the Act has defined digital signature as – "digital signature means authentication of any electronic record by a subscriber by means of an electronic method or procedure in accordance with provisions of Section 3". Section 3(2) states, "The authentication of the electronic record shall be effected by the use of asymmetric crypto system and hash function which envelop and transform the initial electronic record into another electronic record".

Section 2(1)(f) defines 'asymmetric crypto system', as – "asymmetric crypto system means a system of a secure key pair consisting of a private key for creating digital signature and a public key to verify the digital signature", Section 2(1)(zc) and Section 2(1)(zd) defines 'private key' and 'public key' as - "private key means the key of a key pair used to create digital signature" and "public key means the key of a key pair used to verify a digital signature and listed in the Digital Signature Certificate". It may be noted that digital signature is unlike a conventional signature. It is nothing but transformation of an electronic record into another electronic record with the help of private key. In this connection let us discuss about cryptography.

Cryptography- In Greek, it means secret writing. It is the science of codification, which converts a normal text into junk characters (known as cipher text). The process of coding is called encryption and the process of decoding is called decryption. Encryption and decryption is done through software. These software are called Public Key and Private Key. Private Key is kept secret and the Public Key is made public.

Explanation to Section 3(2) states, "hash function means an algorithm mapping or translation of one sequence bits into another, generally a smaller set, known as 'hash result' such that an electronic record yields the same hash result every time the algorithm is executed with the same electronic record as its input making it computationally infeasible –

(a) to derive or reconstruct the original electronic record from the hash result produced by the algorithm;

(b) that two electronic records can produce the same hash result using the algorithm."

In short, it can be said that the process of digital signature involves the converting electronic record into secret code first, and then translating the codes into a small number by applying a formula. Each licensed Subscriber uses unique secret code and formula, which is known to him only. This is done through private key. Based on private key techniques, public key is designed.

7. Conclusion

E-commerce can bring immense benefit both to the buyers and the sellers. But it has not developed to the level as was envisaged. It is because it is not free from problems. These are, security problem, poor spread of Internet facility, lack of face-to-face contact, taxation problem, problem of intellectual property right violation etc. Some of these problems have been addressed by enactment of laws. We are confident that all the problems will be addressed in course of time and it will become most popular mode of commerce.

Network Related Terminologies

1. **Computer Network**- Connection between two or more computers through cable line or through satellite. It is a hardware link managed by software. Following types of computer networks are found:

   LAN (Local Area Network) -Normally within an organization.

   MAN (Metropolitan Area Network) - Normally within a Metro.

   WAN (Wide Area Network)- Normally within a State/Country.

   Internet (International Network)- WANs located in different parts of the world are connected to form a worldwide network of computers. It is a networking of the networks. Internet connections may be- (a) Dial up line, (b) ISDN line, (c) Leased line etc.

2. **Web Server** – It is the software, with the help of which websites are published. Examples of **HTTP** (Hyper Text Transfer Protocol) based Web Servers are - Apache, Quid Quo Pro, Quid Pro Quo, Front Page, Website Professional etc. Servers based on other protocols are FTP, Gopher, NNTP, Database etc.

3. **Web Browser** - The software that fetches and displays websites. Example- NCSA Mosaic (being the first, developed in 1993), Internet Explorer, Netscape Navigator etc. It is also called **Client.**

4. **Server Computers-** These computers host web servers and are located at the place of Internet Service Providers.

5. **Client Computers-** The computers located in offices, at homes etc. through which we access to web sites.

6. **Hypertext** - It is that type of text (used in web), which facilitates hyper linking of web documents containing text, graphics, animation, audio, video, images or programs. It is also called hypermedia.

7. **Web Pages** – Hypertext documents in the Internet are called web pages. Each page is a hypertext file. A set of web pages of a particular organisation is called <u>Web Site</u>. The first page is called <u>Home Page.</u> It is also called **Web or Domain.**

8. **WWW** (World Wide Web) - It was the first web site developed at CERN, Switzerland, in 1989. Presently websites as a whole are called WWW. WWW is also the name of an Internet search tool.

9. **Portal-** Websites, which have the facility of search engines, e-mail and other value added services, are called portals.

10. **Search Engine–** Some websites facilitates searching of web addresses relating to a particular subject. If we type the subject matter in the designated text box, the search engine will give a complete list of web addresses, which contain the subject matter.

11. **Cyber** (Cybernetics) – Cybernetics is the science of communication and control in biological system. Computer systems also have a built-in mechanism of communication and control. However, the word 'cyber' has become synonymous with the word Internet.

12. **Protocol & Protocol Suite**– A protocol consists of software and it is the communication language spoken by the computers in the network. A *protocol suite* is a set of protocols. At present two protocol suites are in use- (i) TCP/IP (ii) ISO/OSI (International Standard Organization/ Open System Interconnection).

13. **TCP/IP** (Transmission Control Protocol/Internet Protocol)- Developed in mid-seventies. The purpose of TCP/IP was to connect different network (i.e. copper wire, radio, microwave) and still enable the host computers to talk to each other coherently.

14. **URL** (Universal Resource Locator)- Another name of web site address. It helps to locate web resources. It is also called **Domain Name.**

15. **ISP** (Internet Service Provider)- The agency that provides service related to Internet. Example- VSNL, BSNL, Satyam etc.

16. **Gateway-** It is the main gate through which Internet links with other countries are maintained. Example- VSNL in India.

17. **Modem**- (<u>Mo</u>dulator <u>Dem</u>odulator)- Computers are digital but telephone lines are analog. For data communication through Internet, conversion from analog to digital and vice-versa is required. A modem serves this purpose. However, where the telephone line is digital, use of modem is not required.

18. **Firewall**- A firewall a security system for network. It consists of hardware, software or both that isolates a private network from a public network. It allows insiders full access to the public network but allows only selective access from the public network.

19. **M-commerce-** E-commerce with the help of mobile phone/laptop etc. is called M-commerce.

20. **VAN-** (Value Added Network)- It is a network that works as a storehouse/ mailbox. It is used in EDI and cell phone network. A data deposited in a VAN can be retrieved according to the convenience of the receiver.

References

Kalakota, Ravi & Whinston, Andrew B. (2000), Frontiers of Electronic Commerce, Addison-Wesley, Delhi.

Treese, G. Winfield & Stewart, Lawrance C. (2000), Designing System for Internet Commerce, Addison-Wesley, Delhi.

Jain, V. K. & Hemlata (2001), Enterprise Electronic and Mobile Commerce, Cyber-Tech Publications, New Delhi.

Rayudu, C. S. E. (2004), E-Commerce: E-Business, Himalaya Publishing House, Mumbai.

Information Technology Act, 2000.

U. G. C. Model Curriculum in Commerce, New Delhi, 2001.