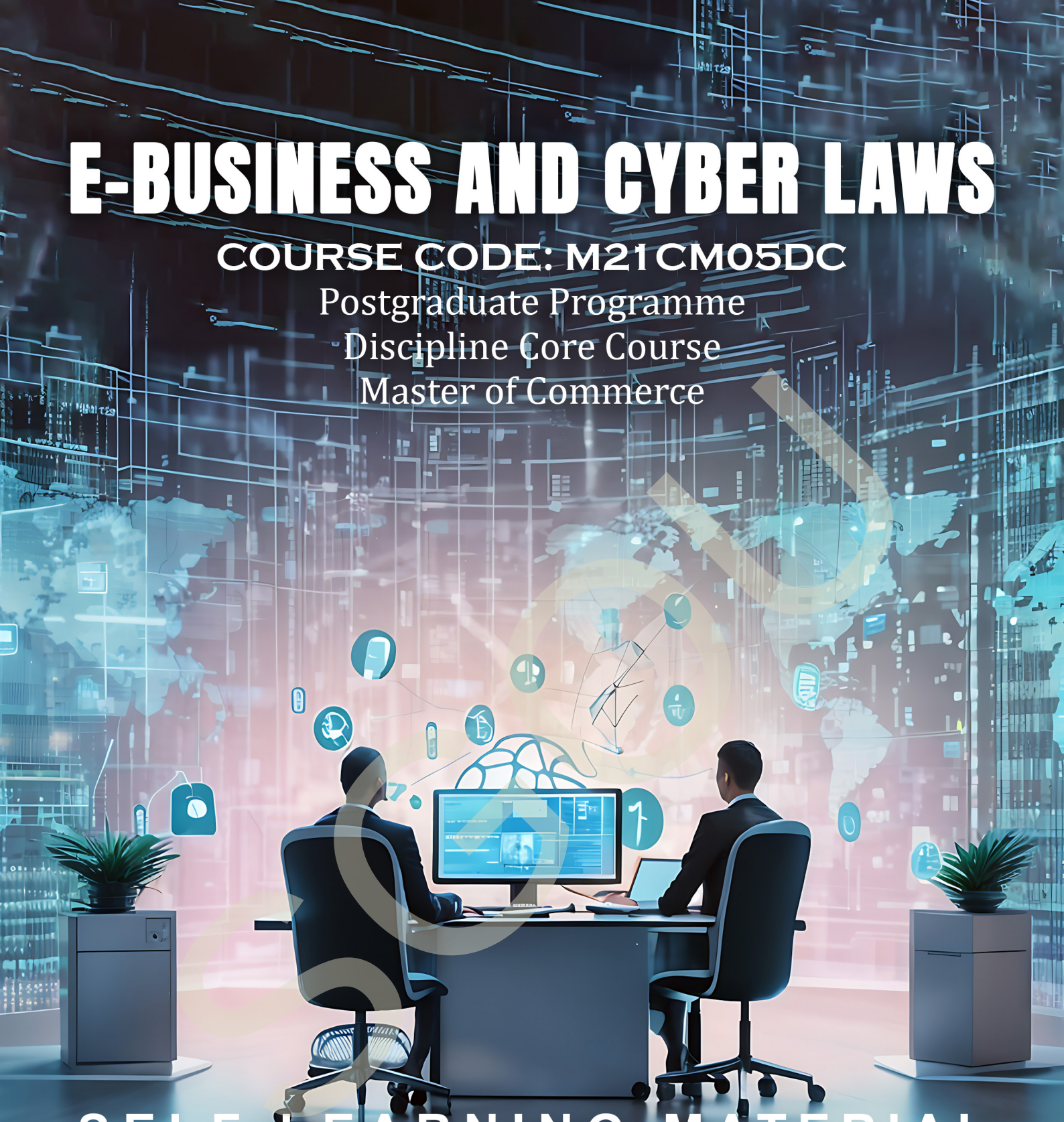
E-BUSINESS AND CYBER LAWS

COURSE CODE: M21CM05DC

Postgraduate Programme
Discipline Core Course
Master of Commerce



SELF LEARNING MATERIAL

SREENARAYANAGURU OPEN UNIVERSITY

SREENARAYANAGURU OPEN UNIVERSITY
The State University for Education, Training and Research in Blended Format, Kerala

SREENARAYANAGURU OPEN UNIVERSITY

Vision

To increase access of potential learners of all categories to higher education, research and training, and ensure equity through delivery of high quality processes and outcomes fostering inclusive educational empowerment for social advancement.

Mission

To be benchmarked as a model for conservation and dissemination of knowledge and skill on blended and virtual mode in education, training and research for normal, continuing, and adult learners.

Pathway

Access and Quality define Equity.

E-Business and Cyber Laws

Course Code: M21CM05DC

Semester - II

Discipline Core Course
Master of Commerce
Self Learning Material
(With Model Question Paper Sets)

SREENARAYANAGURU
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MESSAGE FROM VICE CHANCELLOR

Dear learner,

I extend my heartfelt greetings and profound enthusiasm as I warmly welcome you to Sreenarayanaguru Open University. Established in September 2020 as a state-led endeavour to promote higher education through open and distance learning modes, our institution was shaped by the guiding principle that access and quality are the cornerstones of equity. We have firmly resolved to uphold the highest standards of education, setting the benchmark and charting the course.

The courses offered by the Sreenarayanaguru Open University aim to strike a quality balance, ensuring students are equipped for both personal growth and professional excellence. The University embraces the widely acclaimed “blended format,” a practical framework that harmoniously integrates Self-Learning Materials, Classroom Counseling, and Virtual modes, fostering a dynamic and enriching experience for both learners and instructors.

The university aims to offer you an engaging and thought-provoking educational journey. This learning material titled "E-business and Cyber Laws" offered for the MCom programme builds on the knowledge gained in undergraduate studies. It takes the basic understanding of digital business concepts and expands on them, incorporating the crucial legal aspects of operating in the online space. The course combines theory and real-world practices to give learners a comprehensive picture of the e-business landscape and its legal framework. We use case studies and examples to help explain complex ideas in both e-business strategies and cyber law applications. The Self-Learning Material has been meticulously crafted, incorporating relevant examples to facilitate better comprehension.

Rest assured, the university’s student support services will be at your disposal throughout your academic journey, readily available to address any concerns or grievances you may encounter. We encourage you to reach out to us freely regarding any matter about your academic programme. It is our sincere wish that you achieve the utmost success.

Warm regards.
Dr. Jagathy Raj V. P.

07-08-2024

CONTENTS

01 BLOCK

E-business and E-Marketing

Block Content

Unit 1

E-business

Learning Outcomes

By the completion of this unit, the learner will be able to:

- explain the concept of E-business
- describe what is meant by E-business and E-commerce
- ascertain the transformation of the business structure
- identify the E-business models

Background

The 'internet economy', 'the information economy', or 'the digital economy'; these terms are used to define the distinct contributions to the economy through the use of the internet, digital technology, or Information and Communications Technology (ICT). Together these types of technologies have created the so-called 'new economy', one that is based on entrepreneurship in knowledge creation and sharing, innovation and creativity, and utilizing information technology for developing and selling new products and services. The new economy defined the industrial landscape of the late twentieth century and will be the dominant driver of economies well into the new millennium.

The new economy has been boosted by the development of the infrastructure that supports the Internet, ICT, and digital technology. The rollout of high-speed broadband internet access means more people can connect to the internet at a higher speed and with greater flexibility and scope of activities. Digital exchanges and fiber-optic networks mean that the convergence of technologies further boosts the new economy. Where once the internet, television broadcasting, and telecommunications were separate and distinct convergence of industries, means that these sectors have increasingly merged, thereby offering consumers greater scope for accessing services via one technology. For example, the new economy is boosted by the development of internet access on mobile phones because it means knowledge workers can access information and communicate with others from almost any location. The convergence of the internet and television means that interactive television provides additional media for facilitating online sales of products and services.

At the business level, organizations are no longer viewed as individual entities but as part of an integrated network of organizations where information and communications technologies play a key role in smoothing transactions and collaborative ventures between partners. The internet has opened up the possibility of exchanging information, products, and services around the globe without any restraints on time or distance. This has given rise to the concept of 'E-business'. Indeed, the new economy is characterized by changes to the boundaries of whole economies as well as industries and firms. In the last few decades, these changes have led to a marked acceleration in globalization. This unit deals with E-business technologies and trends in E-business.

Keywords

E-business, E-commerce, Trends, E-commerce models

Discussion

- Role in global economy

In today's world, we are exposed to various forms of E-business. Since its emergence, it has grown by leaps and bounds. Some predict that it may very soon overtake brick-and-mortar stores completely. While that remains to be seen, we cannot ignore the immense role it plays in the current global economy.

- Applying technology in business

Commerce means trade and aids to trade. Thus, it includes the purchase, sale, and exchange of commodities. Therefore, it can be defined as an exchange of commodities or all activities involved in transferring goods from producers to consumers. Commerce has been a major part of human lives since the beginning of history. The implementation of the Internet has created a paradigm shift in the way businesses are conducted today. The past decade has witnessed the emergence of a new kind of commerce known as E-commerce. According to the European Union's Web site, E-commerce is a concept dealing with any form of business transaction or information exchange executed using Information and Communication Technology (ICT), between companies, and their customers, or companies and public administrations. According to IBM's Website, E-business is defined as the concept of transforming key business activities through the use of Internet technologies.

The three main processes enhanced in E-business are:

- Broader concept

i. Production processes, which include: (a) Procurement, (b) Ordering and replenishment of stocks, (c) Processing of payments, (d) Electronic links with suppliers and (e) Production control processes.

ii. Customer-focused processes, which include: (a) Promotional and marketing efforts, (b) Selling over the Internet, (c) Processing of customers' purchase orders and payments and (d) Customer support

iii. Internal management processes, which include: (a) Employee services, (b)Employee training, (c) Internal information-sharing (d) Video conferencing and (e) Recruiting E-commerce that generally meets the needs of an organization, retailers and consumers to reduce the costs. It also considers the quality of service and delivery of goods.

1.1.1 E-commerce and E-business

Some use the terms E-commerce and E-business interchangeably, but these terms refer to different concepts.

- Buying and Selling through Internet

Electronic commerce, also termed as E-commerce, is a process of buying and selling goods or services using electronic systems. These electronic systems can either be the Internet or other computer networks. The World Wide Web plays a major role in the implementation of E-commerce in most of the organizations.

- Help to reduce the cost of business operation

E-business has emerged as a mainstream solution for many businesses. It focuses on the business as a whole and is not restricted to commercial transactions. It involves streamlined and automated construction and maintenance of business processes across production, development, corporate infrastructure, and product management with internal and external connectivity through the internal intranet or extranet, an E-business strategy that aims at reducing operating costs to increase productivity and improve the bottom line. It enables better responsiveness to customer needs, transparent communication with businesses, and improved vendor relations.

Table 1.1.1 Comparison between E-commerce and E-business

Basis	E-commerce	E-business
Meaning	It refers to performing online commercial transactions and activities over the internet.	It refers to performing every type of business activity through the Internet.

Scope	It is a narrow concept and is a subset of E-business.	It is a broad concept and is a superset of E-commerce.
Transactions	Commercial transactions are carried out in E-commerce.	Business transactions are carried out in E-business.
Limitation	E-commerce transactions are limited.	E-business transactions are not limited.
Activities	It includes selling and buying products, making monetary transactions, etc; over the internet.	It includes customer education, procurement of raw materials, supply activities, making monetary transactions, etc. over the internet.
Operation	It mainly requires the use of only a website.	It requires using multiple websites, ERPs and CRMs, that connect different business processes.
Resource	It involves mandatory use of the internet.	It consists of the use of the internet, extract or intranet.
Coverage	E-commerce covers external/ outward business processes.	E-business covers internal and external business processes/ activties.

1.1.2 Transformation of business structure

- Need for recording transaction

The emergence of large business organizations in the late 1800s and early 1900s triggered the need to create and maintain formal records of business transactions. In the 1950s companies began to use computers to store and process internal transaction records, but the information flows between businesses continued to be on paper. Purchase orders, invoices, bills of lading, cheques, remittance advice, and other standard forms were used to document transactions.

- Exchange of Information on punched cards or magnetic tape

The process of using a person or a computer to generate a paper form, mailing that form, and then having another person enter the data into the trading partner's computer was slow, inefficient, expensive, redundant, and unreliable. By the 1960s, businesses that engaged in large volumes of transactions had begun exchanging transaction information on punched cards or magnetic tape. Advancements in data communication technology eventually allowed trading partners to transfer data over telephone lines instead of shipping punched cards or magnetic tapes to each other.

- Needed substantial investment

Although these information transfer agreements between trading partners increased efficiency and reduced errors, they were not an ideal solution. Since the translation programs that one trading partner wrote usually would not work for other trading partners, each company participating in this information exchange had to make a substantial investment in computing infrastructure. Only large trading partners could afford this investment, and even those companies had to have a significant number of transactions to justify the cost. Smaller or lower trading partners could not afford to participate in the benefits of these paper-free exchanges.

- Transform into computer file

In 1968, several freight and shipping companies joined together to form the Transportation Data Coordinating Committee (TDCC), which was charged with exploring ways to reduce the paperwork burden that shippers and carriers faced. The TDCC created standardized information set that included all the data elements that shippers commonly included in bills of lading, freight invoices, shipping manifests, and other paper forms. Instead of printing a paper form, shippers could transform information about shipments into a computer file that conformed to the TDCC standard format. The shippers could electronically transmit that computer file to any freight company that had adopted the TDCC format. The freight company translated the TDCC format into data which it could use in its information systems. The savings from not printing and handling forms, not entering the data twice, and not having to worry about error-correction procedures were significant for most shippers and freight carriers.

- Fixing the Standard

After a decade of fragmented attempts at setting broader EDI standards, several industry groups and several large companies decided to make a major effort to create a set of cross-industry standards for electronic components, mechanical equipment, and other widely used items. The American National Standard Institute (ANSI) has been the coordinating body for standards in the United States since 1918. ANSI does not set standards, though it creates procedures and organizational standards for the development of national standards and accredits committees that follow those procedures.

- EDI Standards

In 1979, the American National Standard Institute (ANSI) chartered a new committee to develop uniform EDI standards. This committee is called the Accredited Standards Committee X12 (ASCX12), which meets three times a year to develop and maintain EDI standards. The committee and its subcommittees include information technology professionals from over 800 businesses and other organisations. Membership is open to organisations and individuals who have an interest in the

standards. The ASCX12 standard has benefitted from the participation of members from a wide variety of industries. This standard currently includes specifications for several business data interchanges.

In 1987, the United Nations published its first standards under the title EDI for Administration, Commerce, and Transport (EDIFACT, or UN/EDIFACT). As the internet gained prominence as a tool for conducting business, the trading partners who had been using EDI began to view the Internet as a potential replacement for the expensive leased lines and dial-up connections they had been using. Companies that were unable to afford EDI began to look at the Internet as an enabling technology that might get them back in the game of selling to a large number of customers who demanded EDI capabilities of their suppliers.

- Enabling EDI Technology to occupy large number of customers

The major hurdles to conducting EDI over the Internet initially were general concerns about security and the Internet's general inability to provide audit logs and third-party verification of message transmission and delivery. The lack of third-party verification continues to be an issue since the Internet has no built-in facility for that. Because EDI transactions are business contracts and often involve large amounts of money, the issue of non-reputation causes significant concern.

- Security Issues

1.1.3 E-commerce business models

Electronic markets are emerging in various fields. Different industries have markets with different characteristics. For example, an information B2C market differs in many respects from the automotive B2B market. The former represents companies that sell digital information goods, such as news, articles, music, books, or digital videos. In the information B2C market, the electronic infrastructure not only helps match customers and sellers but also acts as the distribution channel, delivering products to customers. In this case, the infrastructure, such as servers and networks, must support the delivery of large files, streaming media and other types of digital goods efficiently. B2C market over the Internet can be viewed as an open system, where the number of participants is unknown. In the automotive B2B market, the products traded, such as parts and components of cars, have a high degree of specificity. The market infrastructure used is to be mainly based on Electronic Data Interchange (EDI) over expensive VAN services. EDI involves the exchange of standarised, structured information between organizations, permitting direct communication between computer systems. At the B2B applications is the strong integration of different applications. Servers, networks, and soft-

- B2B and B2C

ware should provide the infrastructure to integrate Web-based applications with mainframe and legacy systems. B2B is also a closed market in the sense that the number of participants involved in trading is limited.

The different types of E-commerce business models are Intra-B commerce, Business-to-Business E-commerce (B2B), Business-to-Consumer E-commerce (B2C), and Consumer-to-Consumer (C2C) E-commerce.

a) **B2B Commerce:** In B2B Commerce, the two parties involved in business transactions are both business firms. For example, in the manufacturing of automobiles, there is a requirement for a lot of components and these components can be provided by an organisation that is an ancillary of the automobile industry. Both the businesses need to collaborate with each other in order to be successful. Another example can be of the E-commerce company Flipkart which lets users choose and purchase products using the mobile app. They also formed another company called Ekart logistics to take care of the product delivery. This can be seen as an arrangement between two companies to function together in a business.

- Between two business firms

b) **B2C Commerce:** B2C commerce implies that the interaction occurs between the business owner and customer. In this type of commerce, the goods and services provided by the business is directly received by the consumer.

- Interaction between business and customer

One example of this type of commerce can be OTT media company Netflix that provides digital content for viewers with a paid subscription model. The consumers purchase subscriptions in order to view the digital content.

C) **C2C Commerce:** This type of business originates from the customers and the end point of the business is customers only. This type of business is suitable for dealing with products or goods where there is no market mechanism involved.

- Between customers

One such example can be eBay where users sell their items to be purchased by some other user. A similar model can be seen in India in the form of OLX where users can sell their used items by listing the product along with price.

d) **Intra B-Commerce:** This type of business occurs within the organisation, where the requirement for a product is met within the divisions of the organisation.

- Transaction within the organisation

The different activities that come under the intra b-commerce are recruitment and hiring of employees which result in a coordination between management, human resources and finance departments.

Table 1.1.2 Summary of E-commerce Transaction Models

Model	Description	Examples
B2C	Sells products and services directly to customers.	amazon.com,Flipcart, Snapdeal
B2B	Sells products or services to other businesses or brings multiple buyers and sellers together in a central marketplace.	MetalSite.com,VerticalNet.com,SHOP-2gether.com
B2G	Businesses selling to local, state, and federal agencies.	iGov.com
C2C	Customer sells directly to other customers	Ebay.com,InfoRocket.com, OLX
C2B	Customers fix price on their own, which businesses accept or decline.	Priceline.com
B2E	Business-to-employee (B2E) electronic commerce uses an inter business network that allows companies to provide products and/or services to their employees. Typically, companies use B2E networks to automate employee-related corporate processes.	Online insurance policy management. Corporate announcement dissemination. Online supply requests. Special employee benefits reporting.

1.1.4 Business Models

- Models of Business

The transition of a business into an E-business provides many benefits. E-business can offer personalization, effective customer service and streamlined supply-chain management (the strategic management of distribution channels and the processes that support them). For example, the banking industry uses Electronic Funds Transfer (EFT) to transfer money between accounts. In addition, many companies employ Electronic Data Interchange (EDI), which facilitates the standardization of such business forms such as purchase orders and invoices, allowing companies to share information with customers, vendors and business partners electronically.

1.1.4.1 Storefront Model

- Business Model for Merchants

The storefront model is a combination of transaction processing, security, online payment and information storage, enabling merchants to sell their products online. This model is a basic form of E-commerce in which buyers and sellers interact directly. To conduct storefront E-commerce, merchants must organize online product catalogs, take orders through their Web sites, accept payments securely, send merchandise to customers and manage customer data (such as customer profiles). They must also market their sites to potential customers through various media.

1.1.4.2 Shopping-Cart

- E-commerce by Shopping cart

One of the most commonly used E-commerce enablers is the shopping-cart. This order-processing technology allows customers to accumulate items they wish to buy as they browse an E-business Web site. Support for the shopping-cart is provided by a product catalog, which resides on the merchant server in the form of a database. The merchant server is the data storage and management system employed by the merchant. Often, a network of computers performs all the functions necessary to run a Web site. A database is a section of the merchant server designed to store and report on large amounts of information.

For example, a database for an online clothing retailer would typically include such product specifications as item description, size, availability, shipping information, stock level and order information. Databases also store customer information, including names, addresses, credit card data, and past purchases.

Most Web sites that conduct E-business over the Internet today use shopping-cart technology, including www.eddiebauer.com®, www.kbtoys.com, www.niketown.com, www.sears.com and www.jcrew.com.

1.1.4.3 Auction Model

- Sellers set price initially

The Web offers a wide variety of auction sites, as well as sites that search auction sites to pinpoint the lowest prices on available items. Usually, auction sites act as forums through which Internet users can assume the role of either seller or bidder. Sellers can post items they wish to sell, the minimum prices they require to sell the items and deadlines to close the auctions. Some sites allow users to provide additional information, such as a photograph or a description of an item's condition. Bidders may search the site for items they are seeking, view the current bidding activity and place bids—usually in designated increments. Some sites automate the bidding process by allowing bidders to submit the maximum prices they will pay for auction items. On such sites, an electronic system continues bidding for a bidder until the bidder wins the auction or the auction surpasses the bidder's maximum bid price. One of the most popular auction sites on the Web today is eBay (www.ebay.com).

1.1.4.4 The Reverse-Auction Model

- Buyers set price initially

It allows buyers to set prices that sellers compete to match, or even beat. One example of a reverse-auction site is priceline.com, which is a popular site for purchasing airline tickets and making travel reservations. Usually, Priceline can process buyers' bids within one hour. A faster bidding option is available to sellers who are willing to set reserve prices. Although a reserve

price is the lowest price that a seller will accept, the seller can set a reserve price that is higher than the minimum bid. If no bids meet the reserve price, the auction is unsuccessful. Most sellers who set reserve prices at priceline.com receive a series of bids within one hour of their initial posting. However, successful bids on items with reserve prices are binding, meaning that the buyer and seller must commit.

1.1.4.5 Portal Model

- Online Shopping

Portal sites offer visitors the chance to find almost anything they are looking for in one place. They often provide news, sports, and weather information, as well as the ability to search the Web. When most people hear the word "portal," they think of search engines. Search engines are horizontal portals, or portals that aggregate information on a broad range of topics. Other portals are more specific, offering a great deal of information about a single area of interest; such portals are called vertical portals. Online shopping is a popular feature of many major portals. Sites, such as About.com, altavista.com, and Yahoo.com, provide shopping pages that link users to thousands of sites carrying a variety of products. Portals that link consumers to online merchants, online shopping malls, and auction sites provide several advantages. These portals help users collect information on products and services, thus facilitating comparison shopping.

1.1.4.6 Name-Your-Price Model

- State the price by the customers initially

The name-your-price business model empowers customers by allowing them to state the price they are willing to pay for products and services. Many E-businesses that offer this service have formed partnerships with leaders of various industries, such as travel, lending and retail. The online business passes each customer's price request to an appropriate industry partner, who decides whether to sell the product or service to the customer at the stated price. A customer whose price is rejected can offer another price. However, if a price is accepted, the customer is obligated to make the purchase. For example, Priceline.com allows users to submit prices they are willing to pay for airline tickets. However, before the request is submitted, users must enter their purchasing information, so that if their price is accepted by one of Priceline.com affiliate airlines, the user is required to purchase the ticket.

Summarised Overview

The cutting edge for business today is electronic commerce (E-commerce). The effect of E-commerce is already appearing in all areas of business, from customer service to new product design. It facilitates new types of information-based business processes for teaching and interacting with customers-online advertising and marketing, online order taking, and online customer service, to name a few. It can also reduce costs in managing orders and interacting with a wide range of suppliers and trading partners, areas that typically add significant overhead to the cost of products and services.

Self-Assessment Question

1. "E-commerce and E-business are different concepts." Discuss.
2. "E-commerce applications were first developed with innovations like Electronic Funds Transfer (EFT)." Discuss.
3. Explain different E-business models.
4. Explain the features of a B_2B platform for E-commerce.
5. Why do some customers prefer online transactions while others do not?

Assignments

1. "E-commerce and traditional commerce are differentiated based on their business processes and activity." Discuss with examples.
2. "E-commerce is irreversibly linked with the idea of convergence." Explain the concept of media convergence with suitable examples.
3. Suppose you are running an online retail store. Analyze how to make consumer-oriented E-commerce more effective. What are the different components of consumer-oriented E-commerce that need to be considered?
4. "Business-to-business E-commerce differs from Business-to-Consumer E-commerce." Analyse.
5. Visit the Priceline.com site and write a report on the way they have implemented their model.

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

Unit 2

E-business Design

Learning Outcomes

After the completion of this unit, the learner will be able to:

- explain the E-business design
- identify the web presence of E-business
- assess the Internet marketing trend

Background

In today's digital age, businesses need to leverage the power of the internet to stay competitive and meet customer demands. This involves E-business design, which focuses on creating efficient and user- friendly online experiences. Understanding how users utilize websites through browsing behaviour models helps improve user experience and conversation rates. Staying updated with internet marketing trends and digital channels such as SEO, content marketing,social media marketing, e-mail marketing and forth is crucial for keeping up with competition. Mastering these concepts allows business to effectively utilize digital channels to acheive their goals and suceed in the online marketplace

Keywords

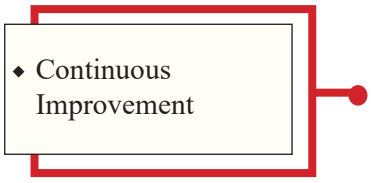
Browsing behaviour, Online marketing, e-advertising, Internet marketing trends, e-branding, e-marketing strategies

Discussion

1.2.1 E-business Design

Traditional "on the street" businesses give customers a direct, in-person experience of the products or services offered. Just as customer experience plays a pivotal role in converting window shoppers to actual buyers, an E-business' website design determines the type of interactions customers have with the business.

Developing a strategic design plan for an E-business requires a customer-focused approach that clearly defines what an E-business has to offer customers within its marketplace sector. Various factors are to be considered when developing an E-business design. They include customer satisfaction, structure of the organization, and the ratio of in-house manufacture to outsourcing, whether the company is function-oriented or process-oriented, the mode of selling, distribution of the product, etc.



The first step in E-business design is self-diagnosis. The management of an organization should examine the effect of changing customer tastes and preferences, the business environment, and the emerging technology trends on the company, and the steps that should be taken to provide direction to the company so that it can cope with the changing environment. Firms should follow an outside-in approach, where the business model is worked out in such a way that customer needs are given utmost importance. They must align the business model and process to fulfil the customer needs. To focus on creative thinking and retain leadership, companies usually use three types of competencies. They are service excellence, operational excellence, and continuous innovation excellence. Service excellence deals with delivering the best services to the customers and offering superior value to them. Operational excellence deals with the production and delivery of error or defect-free products and services at reasonable prices. Continuous innovation excellence deals with continuously increasing performance standards by finding new ways to do things, and developing new products and services ahead of competitors.

To change a company's business model into an E-business model, a foolproof strategy has to be formulated. It essentially needs to have three components – knowledge building, capability evaluation, and E-business design.Knowledge building includes knowing your customers and delivering according to their needs. Capability evaluation includes a company evaluating itself to see whether it can serve its customers with the existing infrastructure. After collecting all the information and analysing it, the organization embarks on designing the E-business model best suited for its processes.

1.2.2 Factors of E-business Design

i. **Customer-Focused**- The online world functions as a visual environment that uses design features to attract and hold a visitor's attention. Since E-businesses seek to market and sell products and services, a website's design becomes the first impression a visitor has of a business' product offer-

- Attract customers

- Redefine niche area

- Site design

- Safe and secure

ings. To attract potential customers, strategic plans for a site design should use a customer-focused approach. Such an approach considers a potential buyer's interests, price range and product expectations. Strategic plans also incorporate strategies to stay abreast of the changes in the online world in terms of new ways of reaching and interacting with customers in an online environment.

ii. **Marketplace Factors** -Whether online or offline, a business' effectiveness relies partly on its ability to carve out a niche within a marketplace. As part of a strategic plan, website design incorporates this niche presence through colour, functionality and the words used to describe the company and its products. Since customer interests and preferences can change over time, an E-business may need to redefine or fine-tune its niche area in order to keep up with customer expectations. Newer communication media, such as social networking sites and audio/video components, may require E-businesses to revamp the structural components that make up a site's design in order to take advantage of different ways of reaching customers.

iii. **Structural Design-** The structural design for an E-business website consists of a format or trail that leads visitors to different areas of the site. Site content material includes text, images and navigational aids that help visitors find their way around. A site design strategy attempts to move visitors toward the products or services offered by the E-business. To help potential customers find an E-business site, designers use keywords and keyword phrases throughout the site's contents to attract search-engine visitors. The use of keywords also helps to link the pages of a site together, which attracts search-engine spiders. In effect, search-engine spiders decide which sites to display when a visitor searches for a particular term.

iv. **Security**- With E-business sites focusing on marketing and selling products, security becomes an important plan objective in terms of ensuring safe and secure money transactions. Site designers must select the types of components to use for handling the actual money transactions that take place at the site. With a range of different shopping cart options and merchant gateways to choose from, designers must be sure to avoid incompatibility issues, which could leave a workable site design vulnerable to potential hack-

ers. Sites that sell physical products must also ensure that customer information remains secure when sending orders to the companies that ship or mail the products to the customers.

1.2.3 Identifying Web Presence Goals

- Knowing a customer

Imagine yourself as a local business person, standing behind the counter of your beautiful new store. There are nice pictures on the walls, the shelves are filled with products, and your cash register is ready and waiting to ring up the next customer. There's just one small problem with this imaginary business; you haven't had a single customer in several days. Let's apply this scenario to a website. All of the files have been uploaded to your beautiful new site, but you haven't had any visitors. Both the physical store and the website have failed to establish a presence. In other words, no one knows who or where you are.

- Need for web presence

One method of measuring your web presence is by counting the number of customers who have visited your website within a given period. Customers have found their way to your website because you have taken the time to develop your content and key pages; you may also be communicating with your customers through other forms of online media. As your web presence increases, so does your potential for higher financial rewards. If a customer cannot find your business, either online or in person, you do not exist. To achieve your business goals, you must develop an online strategy for increasing your web presence. For example, when customers search the Internet, they should be able to find your website. Your business or name could also pop up about a blog, digital newsletter, online business directory, or social media account.

- Provide Information related to the Product and Services

Different firms, even those in a similar business, may establish different Web presence goals. For example, Coca-Cola and Pepsi are two companies that have established very strong brand images and are in the same business but have developed very different Web presences. The Coca-Cola page usually includes its corporate image such as the Coke bottle, while the Pepsi page is usually filled with hyperlinks to a variety of activities and product-related information. The Web presences project the image of these companies. Each presence is consistent with other elements of the marketing efforts of companies. Coca-Cola is maintaining its long-drawn traditional position, and Pepsi is the upstart product favored by the younger generation.

Benefits of web presence

An effective site creates an attractive presence that meets the

objectives of the business or the organisation. These include:

i. to attract visitors to the Web site.
ii. to make the site interesting so that the visitor stays and explores.
iii. to persuade the visitors to follow the site's links to obtain information.
iv. to create the desired image of the organisation in the visitor's mind.
v. to reinforce positive images that the visitor may already have about the organisation.

- Provide Complete Information to the Users

The Toyota website is a good example of an effective Web presence. The site provides a product showroom feature, links to detailed information about each product line, links to dealers, and links to information about the company and the ancillary services it offers, such as financing and insurance. The page also offers a help link and contact information. A good example of how Toyota has created a presence with this page that is consistent with its corporate philosophy is the statement that appears on the page: "…we've built a website that illustrates why Toyota's Cars and Trucks are ideal for your life…" The website lives up to this and it is proof of the indelible corporate presence that Toyota wants to establish through the Internet to all potential customers.

1.2.4 E-Marketing

- Influence of technology on marketing

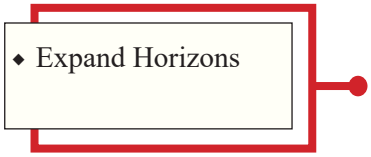
Online marketing or e-marketing means using the power of networks, computer communications, and digital media to reach the marketing objectives. Online marketing will not replace traditional forms of marketing anyway. Instead, it will both add to and subtract from today's marketing mix. It will add more interactivity. But it will subtract costs. It will add more customer choices. But it will remove marketing's dependence on paper. It will add "information value" to products and services. But it will take away barriers to starting a business or extending a business into international markets.

- make complex purchasing decision

The marketing segments are as follows

i. **Cyber buyers** -These are professionals who spend a good deal of time online, mainly at their places of business. These professionals often have to make complex purchasing decisions that require realms of data and difficult-to-locate sources of supply, all within a tight time frame. That is a perfect fit with the capabilities of online technology.
ii. **Cyber consumers** - These are the home computer users wired up to commercial online services and the Internet.

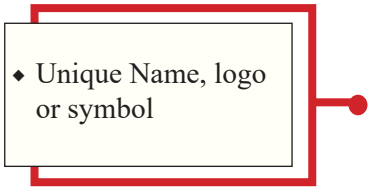
This group represents the pot of gold, and markers simply need to find ways to make it more attractive to stop and buy online than to go to the local store.



iii. **Cyber Surfers -** They use online technology to expand their horizons, challenge their abilities, and for fun. This segment is typically younger and possesses shorter attention spans. Some of the aspects of marketing are advertising, sales, security of the transactions, and the mode of payments. All of these have had to adapt and change themselves according to the demands of the Internet.

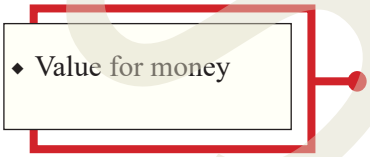
iv. **Tactics of E- marketing** - E-Marketing Competition is intense in the E-business and E-commerce worlds, and a solid E-marketing strategy can give a company an advantage. The components of e- marketing are the follows.

1.2.4.1 E-branding



A brand is typically defined as a name, logo, or symbol that identifies a company's products or services. Brands should be unique, recognizable, and easy to remember. Brand equity includes the value of tangible and intangible items, such as a brand's monetary value over time, customer perceptions, and customer loyalty to a company and its products or services. Businesses that already have a solid brand may find it easier to transfer their brand to the Internet, whereas Internet-only businesses must strive to develop a brand that customers trust and value.

A known and respected brand name can present to potential customers, a powerful statement of quality value and other desirable qualities in one recognisable element. Branded products are easier to advertise and promote because each product carries the reputation of the brand name. Companies have developed and nurtured their branding programmes in the physical marketplace for many years. Consumer brands, such as Ivory soap, Walt Disney entertainment, Maytag appliances, and Ford automobiles have been developed over many years with the expenditure of tremendous amounts of money. However, the value of these and other trusted major brands far exceeds the cost of creating them.



1.2.4.2 Marketing Research

Marketing research can help a company develop its marketing mix, which includes product or service details and development, effective pricing, promotion, and distribution. Traditionally, marketing research has consisted of focus groups, interviews, paper and telephone surveys, questionnaires, and secondary research (findings based on previously collected

data). Research can now be performed over the Internet, giving marketers a new, faster channel through which to find and analyze industry, customer, and competitor information. The Internet also provides a relaxed and anonymous setting on which to hold focus group discussions and distribute questionnaires. To target marketing campaigns effectively, it is useful to learn about the demographics of the Internet, World Wide Web, and wireless device users. Demographics are statistics on the human population, including age, sex, marital status, and income. Knowledge of customers' personal information can help to reveal their purchasing preferences and buying power. Through additional research and analysis, marketers gain information about customers' psychographics, which can include family lifestyles, cultural backgrounds and values. Through online focus groups, current or potential consumers can present their opinions about products, services or ideas. This feedback can be useful when making critical decisions concerning the launch of new products, services or campaigns.

- In-depth study of market

1.2.4.3 E-mail Marketing

E-mail marketing campaigns provide an inexpensive and effective method of targeting potential customers. The marketer should define the reach of a campaign, or the span of people the marketer would like to target, including geographic locations and demographic profiles. The marketer should also determine the level of personalization of the campaign. Personalized direct e-mail targets consumers by using their names, offering them the right products at the right time and sending special promotions based on their interests. Internet mailing lists can help marketers target customers through personalized e-mail. Option e-mail is sent to people who explicitly choose to receive offers, information and promotions. One popular form of opt-in e-mail is an e-newsletter that is used to keep customers up-to-date on recent products and services as well as to offer special deals and promotions to opt-in subscribers. Newsletters and other opt-in e-mails are effective tools to keep a company's target audience informed of company news without the customer having to visit the company's Web site frequently. However, it is important to avoid flooding opt-in customers with promotional e-mail. Excessive correspondence can decrease the effectiveness of an e-mail campaign. Marketers should avoid sending e-mail to people who have not shown interest in specific products or services. Spamming—the distribution of mass e-mails to people who have not expressed interest in receiving information from a company—can give a company a poor reputation.

- Marketing through e-mail

1.2.4.4 Promotions

Promotions can both attract visitors to a site and influence purchasing. Promotions can also be used to increase brand loy-

- Effective way to attract customers

alty through reward programs. Frequent-flyer miles, point based rewards, discounts, sweepstakes, free trials, free shipping and e-coupons are all examples of promotions. Although promotions are an effective way to establish contact with potential customers, it is vital to make sure that customers are becoming loyal to the company, rather than to its promotions or rewards program. In addition, the costs of the program must be monitored carefully to make sure that a company is receiving a return on its marketing investment.

1.2.4.5 Consumer Tracking

- Visitor Tracking

While generating website traffic is important to an E-business, it is not sufficient to ensure success. Keeping user profiles, recording visits and analysing promotional and advertising results are helpful when measuring a marketing campaign's effectiveness. By discovering the target market, the group of people toward whom it is most profitable to aim a marketing campaign, a company can focus its campaign, increasing the number of visits, responses, and purchases. Marketers use log files (files that contain data generated by site visits, including each visitor's location, IP address, time of visit, and frequency of visits) and log-file analysis (the organization and summarization of information contained in log files) to monitor consumer information. ID cards (tracking devices that provide Websites with the numerical addresses of consumers and information regarding their operating systems) record and convey information requested by users. Cookies, another type of tracking device, are text files stored by Web sites on individuals' personal computers. Cookies allow a site to track the actions of a visitor. The first time a user visits a Web site, the user's computer may receive a cookie. The cookie is reactivated each time the computer revisits the site. The information collected is intended to be an anonymous account of log-on times, visit durations, purchases made on the site, the site previously visited and the site visited next. Although the cookie resides on the user's hard drive, it does not interact with other information stored on the system; furthermore, cookies can be read only by the hosts that place them.

1.2.5 Browsing Behaviour Model

Customers of an E-commerce site interact with it through a series of consecutive and related requests made during a single visit called a *session.* Within a session, customers can issue requests of different types, such as Login, Browse, Search, add to shopping cart, or pay. Different customers may exhibit different patterns of navigation through an E-commerce site and therefore may invoke the different functions provided by the site in different ways and different frequencies. Some customers may be heavy buyers while others may be occasional buyers who do

extensive searching and browsing, but very rarely buy from the site. The customer's behavior while interacting with an E-commerce site has impacts on the IT resources of the site and the revenue of the e-store. Thus, it is important to be able to characterize the behavior of customers or groups of customers of an E-commerce site. The customer model captures elements of user behavior in terms of navigational patterns, E-commerce functions used, frequency of access to the various E-commerce functions, and times between access to the various services offered by the site. A customer model can be used for navigational and workload prediction, so that better websites can be modelled.

- Online shopping Navigation device

1.2.5.1 Browsing Behaviors Model of an Online Video Store

Let us use an example of an online video store to give an informal introduction to the user behavior model of an E-commerce site. Consider an online video store in which customers can perform the following functions:

i. Connect to the home page and browse the site by following links to bestseller and promotions of the week per video category.
ii. Search for titles according to various criteria including keywords and title.
iii. Select one of the videos that results from a search and view additional informations such as the brief description of the product/products, price, shipping time, ranking, and reviews.
iv. Register as a new customer of the virtual video store. This allows the user to provide a username and a password, payment information (e.g. credit card number), mailing address, and e-mail address for notification of order status and videos of the internet.
v. Login with a username and password.
vi. Add items to the shopping cart.
vii. Pay for the items added to the shopping cart.

Thus, during a visit to the online video store, a customer issues requests that will cause these functions to be executed. For example, a customer may cause a search to be executed by submitting a URL that specifies the name of an application to be run at the server through a server Application Programming Interface (API) and the keywords to be used in the search. The application will then execute a search in the site database and return an HTML page with all the videos that match the search in the site database. Remember that the sequence of consecutive requests issued by the same customer during a single visit

- Order of Purchase

to an E-commerce site is called a *session.*

1.2.6 Electronic Advertising

- Online Media

E-business advertising is conducted through media such as television, movies, newspapers, and magazines, as well as online and wireless channels. Advertising allows E-businesses the opportunity to establish and strengthen branding. The publication of URLs on all direct mailings, business cards, billboards, printed materials, wireless advertisements, and other media also can increase brand awareness, bringing more visitors to a site. While newspapers, magazines, television, and films all provide effective advertising channels, the Internet is quickly becoming an important medium through which to market companies, products, and services.

- Forms of e-Advertising

Online advertising can include the placement of links and banners on other companies' Web sites and the registration of sites with search engines and directories. In addition, a business can obtain additional income by charging other companies for placing their advertisements on its site. Banner advertisements are similar to billboards seen along the highway, but banners offer the additional feature of interactivity. Valueclick.com and Doubleclick.com are examples of companies that offer banner-hosting services. Some company's base advertisement charges on the number of times a banner ad is viewed on a page, whereas others charge according to the number of click-throughs generated by the banner ad. However, in both systems, advertisers pay only when a viewer clicks on the banner ad and goes to that Web site. Pop-up ads are another form of advertising.

- Ranking the performance and effectiveness of company through e-Advertising

Pop -ups appear instantly when a user visits a particular Website. These ads are either displayed as a separate Web page launched in a browser or built into the page that a user is currently viewing. Visitors to some sites may see multiple ads appear at one time on the site they have chosen. The invasive nature of pop-up ads can detract from the user's browsing experience, thus diminishing the return a company can get on the ad's effectiveness. Search engine "pay-for-performance" advertising has become a billion-dollar industry and is one of the fastest-growing forms of advertising on the Web.15, search engines, such as Google, Overture, Yahoo!, MSN, AOL, and Earthlink allow businesses to purchase keywords that best describe their products or services (e.g., IT consulting, gardening, E-business solutions). Then, when a consumer searches for those keywords, relevant Web links that best match the keywords are returned along with additional advertising links ranked according to the highest bidder for those specific keywords. If a user clicks on a

company's ad, then the company is charged based on the number of click-throughs to its site generated by that ad. In turn, search engines monitor the number of times users actually click on a company's add to determine its effectiveness and performance. If a company's ad is not performing well, then its ranking is lowered (regardless of what it bid on the keywords) and other companies that have bid on the same keywords advance upwards in the rankings.

Following are the reasons for the growing importance of e-advertisements:

i. People increasingly prefer to surf the Internet rather than watch TV.
ii. The target audience goes to the advertisement, rather than the other way around.
iii. Development of business search engines by companies such as C2B Technologies, which aim to link buyers with online bargain sites for over a million products for comparison-shopping purposes.
iv. Yahoo…has a business unit that offers contests and prizes to online participants, which drive players to the websites of different clients. To play, participants present a valuable database of customer preferences.
v. The growth of E-business. Dell Computers, for example, estimates that by 2005, 85 percent of its sales will be through the Internet.
vi. The Internet is not geographically restricted. Amazon.com sells 20 percent of its books to foreign destinations, whereas a physical bookstore serves an area of only a few square miles.

1.2.7 Internet Marketing Trends

The nature of the Web, with its two-way communication features and traceable connection technology, allows firms to gather much more information about customers' behaviour and preferences than they can by using micro-marketing approaches. Now, companies can measure a large number of things that are happening as customers and potential customers gather information and make purchase decisions. The idea of technology-enabled relationship management has become possible when promoting and selling via the Web. Technology-enabled relationship management occurs when a firm obtains detailed information about a customer's behaviour, preferences, needs, and buying patterns and uses that information to set prices, negotiate terms, tailor promotions, add product features, and otherwise customize its entire relationship with that custom-

- Technology-enabled relationship management

er. Although companies can use technology-enabled relationship management concepts to help manage relationships with vendors, employees, and other stakeholders, most companies currently use these concepts to manage Customer Relationship Management (CRM) or Electronic Customer Relationship Management (E-CRM).

- Enable customer relationship

Successful, new Web-marketing approaches involve enabling the potential customer to find information easily to customize the depth and nature of that information and encourage the customer to buy. Firms should track and examine the behaviours of their website visitors, and then use that information to provide customized, value-added digital products and services in the market space. Companies that use these technology-enabled relationship management tools to improve their contact with customers will be more successful on the Web than firms that adapt advertising and promotion strategies that were successful in the physical world but that are less effective in the virtual world.

- Driving forces

The results of a survey of global chief executive officers indicate significant Internet growth and business usage over the next five years, with 92 percent of executives projecting revenues derived from E-commerce. Although the information technology that supports electronic marketing currently accounts for just 8 percent of the United States' total economic output, over the last five years, it has fuelled more than one-third of economic growth in the United States. The remarkable growth and impact of the Internet and the World Wide Web have spurred almost every business to explore e-marketing strategies to enrich relationships with customers, employees, and suppliers. The characteristics and availability of the E-commerce infrastructure are driving strategic planning.

Dimensions	E-CRM	CRM
Advertising	Provide information in response to specific customer inquiries.	Push and sell a uniform message to all customers.
Targeting	Identifying and responding to specific customer behaviours and preferences.	Market segmentation

Promotions and discounts offered	Individually tailored to customer	Same for all customers
Distribution channels	Direct or through intermediaries; customer's choice	Through intermediaries chosen by the seller
Pricing of products or services	Negotiated with each customer	Set by the seller for all customers
New product features	Created in response to customer demands	Determined by the seller based on research and developed
Measurements used to manage the customer relationship	Customer retention; total value of the individual customer relationship	Market share; profit

1.2.8 E-marketing Strategies

1.2.8.1 Permission-marketing Strategies

- Sending messages to the preferred customers

Many businesses would like to send e-mail messages to their customers and potential customers to announce launching of new products, new product features, or sales on existing products. However, print and broadcast journalists have severely criticized some companies for sending e-mail messages to customers or potential customers. Some companies have even faced legal action after sending out mass e-mails. Unsolicited e-mail is often considered to be a spam.

- Methods of tracking the customer

Many businesses are finding that they can maintain an effective dialogue with their customers by using automated e-mail communication. Sending one e-mail message to a customer can cost less than one cent if the company already has the customer's e-mail address. Purchasing the e-mail addresses of persons who have asked to receive specific kinds of e-mail messages will add between a few cents and a dollar to the cost of each message sent. Another factor to consider is the conversion rate. The conversion rate of an advertising method is the percentage of recipients who respond to an ad or promotion. Conversion rates on requested e-mail messages range from 10% to over 30%. These are much higher than the click-through rates on banner ads, which are currently under 1 percent decrease.

1.2.8.2 Branding-leveraging Strategies

Rational branding is not only the way to build on the Web. One method that is working for well-established websites is to extend

their dominant positions to other products and services. Yahoo is an excellent example of this strategy. Yahoo was one of the first directories on the Web. It added a search engine function early in its development and has continued to parlay its leading position by acquiring other Web businesses and expanding its existing offerings. Then, Yahoo acquired GeoCities and Braoscasr.com and entered into an extensive cross-promotion partnership with several Fox entertainment and media companies. Yahoo continues to lead its two nearest competitors, Excite and Infoseek, in ad revenue by adding features that Web users find useful and that increase the site's value to auctions is another example of a website leveraging its dominant position by adding features useful to existing customers.

- Expand business

1.2.8.3 Affiliate-marketing Strategies

Of course, this leveraging approach only works for firms that already have websites that dominate a particular market. As the Web matures, it will be increasingly difficult for new entrants to identify unserved market segments and attain dominance. A tool that many new, low-budget websites are using to generate revenue is affiliate marketing. In affiliate marketing, one firm's (the affiliate firm's) website includes descriptions, reviews, ratings, or other information about a product that is linked to another firm's site to the seller's site, and the affiliate site receives a commission. The affiliate site also obtains the benefit of the selling site's brands in exchange for the referral.

- A platform that promotes products or services in exchange for sale commissions

One of the more interesting marketing tactics made possible by the Web is cause marketing, which is an affiliate marketing program that benefits a charitable organisation (and thus, supports a "cause"). In visitors click a link on the affiliate's Web page, a donation link carries advertising for the sponsoring companies. Many companies have found that the click-through rates on these ads are much higher than the typical banner ad click-through rates. A leading retail Web florist, proflowers.com, has had excellent results advertising on the hunger site page. When a visitor clicks the button on this page, a group of sponsoring advertisers donates food to a hungry person and a page appears in the visitor's browser with ads for the sponsors.

- Provide Charity

1.2.8.4 Viral-marketing Strategies

Traditional marketing strategies have always been developed with the assumption that the company is going to communicate with potential customers directly or through an intermediary that is acting on behalf of the company, such as a distributor, retailer, or independent sales organisations. Since the Web expands the type of communication channels available, including customer-to-customer communication, another marketing ap-

- Becoming popular

proach has become popular on the Web. Viral marketing relies on existing customers to tell other company's prospective customers the products or services they have enjoyed using. Much as affiliate marketing uses Websites to spread the word about a company, viral-marketing approaches individual customers to do the same thing. The number of customers increases much as a virus multiplies, thus the name.'

1.2.8.5 Content Marketing

- Creative Marketing

Content marketing is a marketing technique of creating and distributing relevant and valuable content to attract, acquire, and engage a clearly defined and understood target audience, to drive profitable customer action. Content marketing is the art of communicating with your customers and prospects without selling. It is non-interruption marketing. Content marketing is being used by some of the greatest marketing organisations in the world, including P&G, Microsoft, and Cisco System.

1.2.8.6 Social Media Marketing

- Directly interact with the customer

Social media marketing becoming one of the most important aspects of digital marketing, which provide incredible benefit that help reach millions of customers worldwide. Social media trends play a vital role in finding ways to engage and interact with customers. Social media transformation is not only a technological shift but also an organisational change which occurs at the intersection of businesses, customer, and technology. Due to this transformation, social media is continuously becoming an important component in the customer decision journey. The first step begins with a complete understanding of the customer journey and its marketing implications. Earlier, there was a linear customer journey where marketer too could control a brand's message, but now they are trying to capture the attention of customers on a fragmented journey. According to some surveys, mobile sessions that average mere 70 seconds long, many times per day are influencing buying decisions. In many ways, these micro-movements have become the footsteps that led people to purchase the products or services. There is no deny the social media marketing has many advantages for start-ups and establish brands. By regular updating the right social media marketing strategy, it will lead to increased traffic, better SEO, improved brand loyalty, healthier customer satisfaction and much more.

Summarised Overview

Effective strategic planning and the selection of tactics appropriate for marketing activity are necessary for E-marketing success. Planning and the use of communication technology are combined in e-marketing plans, and this complementary relationship can assist organisations in monitoring possible issues and dangers while giving them chances to achieve excellence and establish a strategic position in the market. This means that in order to ensure the success of these strategies, the organisation must prepare its promotional mix by attending to the most important components of the strategy and providing the necessary resources.

Self-Assessment Questions

1. Discuss the factors of E-business design.
2. Explain the trends of E-commerce marketing.
3. Describe viral marketing strategy
4. Explain the Importance of browsing model behaviour in E-commerce.
5. Discuss the importance of E-advertisement in E-commerce.
6. Do you agree with the idea that customers are more empowered than they were before digital communications were so prevalent? Explain

Assignments

1. What are the advantages of having an internet version of marketing?
2. Visit the site of *The Times of India* and identify the difference between Internet e-marketing and traditional marketing.
3. How does the marketing model fit into the Internet version of the newspaper.
4. Explain the e -marketing strategies

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

Unit 3

E-Retailing

Learning Outcomes

After completing this unit, the learner will be able to:

- describe the E-retailing concept
- identify the different models of retailing
- analyse the EPOS and its functions

Background

Various IT tools are used by retailers, like POS, RFID, visual display of merchandise, electronic payment systems, social networking, etc. IT has revolutionised the business process and brought about changes in business operations. The Internet has provided an extra edge to customers nowadays; buyers prefer to shop at their convenience and comfort from their homes for various reasons. While surfing the internet, we often see many advertisements regarding various offers and schemes of products for online purchases. This is termed as e-retailing (popularly known as e-tailing). E-retailing simply means retailing over the Internet or selling retail goods on the Internet. In simple words, we can say that retailing refers to shopping through the internet or other media. In this unit, you will learn about e-retail, its components, different models, and Models for web-based information systems in retailing. You will further learn about key technologies of the B2C Model in E-Retailing, EPOS System, and functions of an EPOS System.

Keywords

E-retailing, Models of E-retailing, EPOS, Technologies, functions

Discussion

1.3.1 Electronic Retailing (E-tailing)

- Shopping through the internet

Electronic Retailing also called e-tailing or internet retailing is the process of selling goods and services through electronic media, particularly the Internet. Simply, the sale of retail goods and services online is called electronic retailing. Electronic retailing is the subset of E-commerce which means that E-commerce is the principal domain that includes e-tailing operations.

1.3.2 Electronic Retailing (E-tailing) Transaction Subcategories/ Models of e-tailing

- Different models

Regardless of whether a transaction is being conducted online or in person, there are two specific subcategories of transactions that are executed. They are B2C and B2B transactions, and they carry different implications when conducted in the electronic retailing market.

i. **Business-to-Business (B2B)E-tailing -**Business-to-business (B2B) e-tailing occurs when a business purchases a product or service from another business's website, for its use or to use as a component in its products. The business model differs in B2B transactions when conducted online because fast shipping, quality, and price become increasingly more prominent. Generally, when a business purchases wholesale products online, they are buying large quantities of goods. Therefore, it is important to negotiate reasonable prices with fast shipping and safe handling.

- Large Quantity

- Conditions of purchase

To develop the best e-tailing business model for B2B transactions, the wholesale business must offer quantity discounts, reasonably fast shipping, and ensure that the goods remain undamaged.

ii. **Business-to-Consumer(B2C) E-tailing** - Business-to-consumer (B2C) e-tailing transactions are when a consumer buys a product or service from a business's website, such as shoes of a sports apparel company's website. The business model differs in B2C transactions when conducted online because consumers are very demanding and expect fast delivery and guarantees that the product's quality matches the online description. This

- Demand based transaction

makes shipping times and handling standards very important in any company's e-tailing business model.

Examples of successful B2C companies- Amazon, Walmart, Flipkart, etc. are as follows:

- **Amazon**- Amazon.com is the world's largest online retailer operating in B2B, B2C, and C2C E-commerce segments. The company sells goods directly to consumers, allows users to sell goods themselves, and supports user-to-user transactions
- **Walmart-** Walmart is considered a B2C company because the majority of its products are sold and marketed to consumers. To achieve high sales volumes in B2C, Walmart capitalizes on a customer's emotional attention when shopping offline.

1.3.3 The e-retailers can be of two types:

- **Pure Play e-retailers** such as Amazon, that emerged as the online bookseller. It is present only online and does not have any physical outlet for the customers.
- **Brick-and-click e-retailers** such as Dell, which sells computers through the internet as well as have a physical storefront for the customers.

1.3.4 Advantages of Electronic Retailing

- Through electronic retailing, customers can save both effort and time.
- A wide range of products is available online, so the comparison can be made easily before the purchase.
- The customer can shop anytime and from anywhere, the facility is available 24*7
- Huge discounts can be availed of while shopping online.
- Detailed information about the product is available online which helps the customer make the purchase decision.
- The electronic retailing offers easy payment terms such as payment on delivery that instigate the customer to shop online.

1.3.5 Disadvantages of Electronic Retailing

- The customers may not be sure of the quality of the products offered online.
- Every individual tends to bargain before making the final

purchase, but this quotient is missing in electronic retailing.

- Also, the customers may not trust on the payment gateways and fear the misuse of credit cards or any other mode of payment.
- Every customer wants to see and feel the product that he purchases, but it is not possible in the case of electronic retailing where the customer makes the decision just by looking at the image.
- The product is not readily available; the customer has to wait for some time to get the product in his hands.
- The customer misses the emotional attachment with the seller which leads to less faith in the offerings.

1.3.6 Web-Based Information Systems (WBIS)

- Social network service

Nowadays, people are becoming more interested in online communities to share interests and activities. Most of the social network services are web-based and these sites provide different ways to interact with others such as instant messaging and email. Moreover, WBIS can be used in many ways in our social life, such as educational institutions, new and media organizations, government services, etc.

- Global Market

Business organizations are using this WBIS to develop their business and to run their business globally. Business organizations can select various ranges of products from product databases. That technology lets the organizations know the price list of the products and they can order various products online. So, it works as a buying and selling media all over the world. The organizations can track orders and update the information through the internet. Moreover, nowadays all multinational business organizations are using web-based information systems to maintain communication with other branches. So, this technology is playing an important role in business development.

- Hypertext Principle

A web-based information system is an information system that uses Internet web technologies to deliver information and services to users. This technology is a software system and is used to publish and maintain data by hypertext principle. Web-based information system is the combination of one or more web applications and specific functionality-oriented components. Basically, in this type of information system web browser is used as a front end and all the databases are used as a back end.

1.3.7 Key features of web-based Information System:

Web-based information systems have evolved significantly over recent years with its improvement. Web-based applications have several advantages over traditional software-based applications. Some of the core features of web-based applications are given below:

- **Cross-platform compatibility:**Most web-based applications are compatible with different platforms than traditional installed software. The minimum requirement would be a web browser (Internet Explorer, Firefox, Netscape, etc.). You can use different OS such as Windows, Linux, or Mac to run the web applications.
- **More Manageable:**WBIS only needs to be installed on the server placing minimal requirements on the end user workstation, which makes the system easier to maintain and update as usually it can all be done on the server.
- **Multiple concurrent users:**Web-based applications can indeed be used by multiple users at the same time. It's not necessary to share a screen or send a screenshot when multiple users see and even edit the same document at the same time. Web conferencing and online collaboration companies regulate some key transformations and users only explore what they need to work effectively and co-edit documents together.
- **Reduced cost:**Web-based applications can reduce costs due to support and maintenance, lower requirements on the end user system, and simplified architecture. It doesn't require any distribution or marketing infrastructure**.**
- **Secure live data:**These applications can decrease the risk of losing data due to an unexpected disk crash or computer virus. Companies of web-based applications provide extensive data backup services either as an integral part of a basic service or sometimes as a paid service.

1.3.8 WBIS in E-tailing

- Technical Component

As with most systems, WBIS must consider both business and technology issues. While having the right technical components is important to constructing a successful system, companies need to understand the business implications of their WBIS. Various critical elements need to be considered when designing a WBIS for business success.

WBIS has become more pervasive and a basis for e-tailing. Based on Web technology, WBIS has the potential to:

- reach a broad audience;
- provide rich content and information in a user-friendly interface;
- operate at a lower cost than systems on proprietary networks; and
- seamlessly integrate with other systems to support business processes.

1.3.9 B2C Marketing (Business to Customer)

- Buying Motivation

B2C marketing is a set of strategies, practices, and tactics that a company uses to promote its products or services to consumers. B2C campaigns focus not only on benefits and value, but also on attracting an emotional response from a customer, which is often the main motivation for a purchase.

B2C marketing objectives include the following:

- **Increase website traffic**. B2C campaigns motivate a potential customer to visit a brand's website and learn more about its products.
- **Increase mailing list**. Emails bring the highest number of leads because the visits to the company's website increases; likewise, the number of new subscribers also increases.
- **Study target audience**. This allows you to interact effectively with your customers. B2C companies are actively using segmentation, which makes it possible to send more relevant messages to their audience.
- **Promote website in search results**. The use of keywords helps the site advance in search results. Matching users' search queries also increases traffic.
- **Increase conversions and brand awareness.** B2C marketing strategies help a business reach and retain a wider audience. For this, mass mailings, social networks, and other channels are used. This approach popularizes the brand and increases profits.

1.3.9.1 Features of B2C Marketing

i. **Target audience -** Knowing your target audience gives you a huge advantage over your competitors. When you know your shopper's profile, you don't have to waste

- Ultimate Customer

- Layer of Purchase

- Unique Product

- High quality product at low cost

- Marketing through e-mail

your budget on broad-market advertising. Here, manufacturers of niche goods as well as goods for certain social groups, for example, new born babies, are a big winner.

ii. **Buying cycle**- The distinctive features of B2C marketing include a short sales cycle. Unlike B2B marketing, where the sales cycle is much longer, B2C customers do not spend a lot of time looking for analogy and comparing each function of the product they like. B2C customers usually buy products that their friends have recommended, so the sales cycle is much shorter and less stressful for both the buyer and seller.

iii. **Branding** - Brand success strongly depends on establishing clear differentiation from competitors, developing brand awareness for consumers, and building trust to ensure long-term customer loyalty. Individualism and globalization are opening up new consumer markets, new potential for brands, and greater relevance to consumers. The pursuit of success makes the B2C brand less reflective of what the customer is, but rather how she or he wants to appear to other people. Constant dialogue with the customer at various points of contact with the brand (omnichannel marketing) helps the brand know what customers expect and, ideally, exceed those expectations.

iv. **Marketing costs**- The acceptable cost of marketing is highly dependent on the market niche, level of competition, brand awareness, and many other factors. In a sense, this is the art of promoting a product at the lowest cost of a marketing campaign. Therefore, new techniques are being developed such as Growth Hacking marketing. This is a specific type of marketing approach for ensuring sustainable, scalable growth for start-ups, companies, and websites. The term "Growth Hacking" was proposed by Sean Ellis, who first wrote about the nonlinear approach as the key to winning a consumer's business. It doesn't matter how the growth is achieved. There are no restrictions on communication channels and tools. Growth Hacking marketing is often combined with trying to find shorter "paths" to target clients in existing business processes (including site logic, sales funnels, etc.).

v. **Email marketing -** Email marketing for consumer brands is an effective way to reach target audiences and increase sales. To reactivate existing customers and attract new ones, marketing people use mass email newsletters or per-

sonalized promotional campaigns.

vi. **Search Engine Optimization -** SEO incorporates organic search engine optimization that aims to increase the visibility of a website in unpaid search engine results. Optimization techniques and tools help companies drive traffic to their website and increase sales. For their part, search engines regularly update their algorithms so as not to give advantages to the methods of cheating and pumping the ranking of sites. Therefore, organically valid content is gaining more and more advantages over SEO texts.

vii. **Social media marketing-** Social media marketing is the promotion of a brand, service, or product on platforms, such as Facebook, Instagram, YouTube, and others. With the help of these channels, brands can not only send promotional emails, but also serve notifications. Social networks for B2C companies are a channel for reaching a wide audience of potential buyers and loyal customers.

viii. **Paid Search Advertising-** This is a pay-per-click ad model. Brands pay to place digital ads that appear on search engine results pages or SERPs from Google, Yahoo, and so on. With pay-per-click advertising, the seller pays each time one of your potential leads clicks on your ad. The placement and frequency of these ads are dependent on their quality score and bid.

ix. **Mobile Marketing-** Mobile marketing tools help brands reach leads and loyal customers through their mobile devices. Most often, such tools include SMS, web pushes, and advertising in mobile applications.

x. **Personalization** - Personalizing the offer to the client in both B2C and B2B is one of the key trends in modern business that will determine the development of marketing in the 2020s. Satisfying the needs of a specific person, answering the request of an individual buyer, providing an exclusive service for an ordinary consumer now individualization of the offer is a key success factor and competitive advantage.

- Provide Visibility
- Sale through social media
- Ad model
- Sales through mobile
- Individual Service

Real-time data is becoming increasingly important, such as geolocation movements, transaction histories, and behavioural data, including actions on third-party sites and social networks.

1.3.10 EPOS system (electronic point of sale system)

- Provide Efficiency in business

EPOS stands for Electronic Point of Sale system. It's a combination of EPOS hardware and EPOS software that provides an efficient business operation. With an EPOS system, a store owner can process, and track sales, and other procedures easier. He also gets a better understanding of his business performance. EPOS system is also connected to an E-commerce site. The online-to-offline integration provides customers with seamless stock information and shopping experience.

1.3.10.1 Components of EPOS system

- Software Program

i. EPOS Software- EPOS Software is the key to successful retail management. It is essential to have one EPOS software that suits your business needs. After deciding on the best fit for EPOS software, the next step is to choose compatible EPOS hardware.

Common EPOS till software features includes, depending on specific business needs:

- Stock control and tracking
- Purchase and order processing
- Loyalty programs
- Promotions and discounts
- Integration with an eCommerce website

- Terminal Screen

ii. EPOS Hardware- Depending on specific needs, each business may wish to have different EPOS hardware components. The core hardware comprises a terminal screen. This is where you input orders and process payments. In recent years, the price of touchscreen monitors has fallen and become affordable to many retailers. The touch screen display allows faster data entry at the point of sale and waives the need for a keyboard.

- Prevent employee theft

The additional EPOS hardware components are connected via cables or wirelessly. They may include:

- Cash drawer-It is a lockable metal drawer to store cash. The EPOS system controls by whom and when a cash drawer is opened. Hence, this reduces employee theft.

- Transaction recorded

- Receipt printer-It is a printing device to create a record of the customer's transaction.

- Few transactions

- Barcode scanner: An electronic scanner that reads barcodes to identify product details on the EPOS system. There are different types of barcode scanners, but the most common forms are handheld and multiline. Multiline scanners can read barcodes from different angles, which speeds up the process. They are ideal for places with a high volume of transactions. On contrary, handheld barcode scanners are used where there is a smaller volume of transactions.
- PDQ Terminal: A device to accept credit card payments.

- Small Business

- Tablet/ iPad EPOS: A portable hardware used in addition to/ instead of the traditional EPOS to assist with business operations. This is suitable for such businesses requiring higher mobility or small stores with limited space. For example, mobile vendors, quick-service restaurants, coffee shops, gift shops, juice bars, sandwich shops, etc.

Source: https://www.magestore.com/blog/epos-system/

1.3.10.2 Advantages and disadvantages of an EPOS system

Compared to the traditional POS, an EPOS system has a variety of benefits, especially in long-term:

For customers

- Ensure correct product pricing and information on multiple sales channels;
- Speed up order processing and transactions;
- Allow customers to use promotions and discounts both online and offline;
- Deliver a smooth and convenient shopping experience via multiple payments and shipping methods.

For store owners

- Centralize business operations and manage multiple sales

channels from one place;

- Make better, more accurate inventory forecasts;
- Keep track of business performance to provide insightful reports;
- Reduce time and mistakes in manual processes;
- Enable correct, instant, and easy data update;
- Set tier staff permission to reduce potential employee theft.

1.3.10.3 EPOS disadvantages

There may be drawbacks to adopting an EPOS system, primarily from selecting one that is unsuitable for the requirements or from a lack of ePOS knowledge.

- Expense of EPOS

iii. **A higher but reasonable price-** An ePOS system's implementation and upkeep might be more expensive, particularly for small enterprises. In addition to regular payments for technical support and software upgrades, there can be one-time expenditures associated with hardware, software, and training. But ePOS is more potent and faster. Even though it could cost more, the investment is worthwhile.

iv. **The learning curve and training -**Employee ePOS system training can take time, and some staff members might need more instruction than others. However, not every ePOS system is frightening. On the market, there are configurable, user-friendly solutions that are simple to use and navigate.

1.3.10.4 Functions of the EPOS system

The point-of-sale system emerged from the old hand till machine and cash registers. The functions of the cash register, however, were limited to print the bill and store the cash. The POS system, be that as it may, isn`t lacking in functions, in case if it just seems to be growing each day.

The following are some of the functions that are specific to the EPOS system:

i. **Access anytime -** The retailers can access the data related with the retail business. It could be about customers, stock or the sales regardless of any data that can be accessed from any part of the world.

ii. **Return policy-** With a POS system, the store would never manage returns if the customers want to give back the

product for whatever reasons they don`t want any longer. It is a hassle-free process with a retail epos software, as it could record returns, remove products from sales transactions and include the put the product`s number back in the stock.

iii. **Online Shop-** The POS System made it feasible for retailers to run the business out of the brick and mortar and more to make it run all the while. A purchase made using online or store, a state of POS system won`t miss a detail and everything goes in the database with no problem.

iv. **Business development-** A business grows when it keeps its old customers loyal and also gain a plethora of new customers. The POS system makes it possible for a business to keep data of all customers and get in touch with them or reach them for marketing. The EPOS software also allows the retail business to offer different discount deals, gift vouchers and point rewarding system to their customers.

v. **Faster checkout-** No one likes to stay in long queues at a store when they have important things to work. The POS system plays out its functions a lot faster and in no time, while people are looking at with a grin all over.

vi. **Stock control-** No human or hand till the machine can keep such an intensive and precise eye on the stock of the retail shop and to control it in such an effective manner. It reduces the odds of loss by a big margin. It also reduces the retailers to understand the orders of their customers and through which they keep on providing what their customers want.

vii. **Accounts-** A retailer or a marketing manager can`t whisk out the data all of a sudden to come up with new marketing strategies for that they need data which POS systems does well to keep. The POS system stores data about customer`s history in detail.

Summarised Overview

Electronic retailing (e-tailing) is a buzzword for any business-to-consumer (B2C) transactions that take place over the Internet. E-retailing simply means retailing over the internet or selling retail goods on the Internet. In simple words, we can say that traveling is nothing but shopping through the internet or other media. There are certain essential ingredients for an electronic retailing business to be successful like an attractive business-to-consumer (B2C) E-commerce portal, the right revenue model, e-catalogue,

proper payment gateway and support services in e-retailing, etc. E-tailing provides so many advantages like price selection, the opportunity to reach new markets, extension to leverage 24-hour presence, etc. There are so many challenges that are faced by e-tailers like channel conflict, legal issues, security and privacy issues, etc. To be a successful retailer, it is important to integrate the brick-and-mortar retail store with e-retailing. It provides lots of opportunities. In the present era, no single means of retailing is sufficient to serve the customers, therefore retailers are using multiple channels for their retail stores. Most of the conventional brick-and-mortar stores have now become click-and-mortar stores and enjoying the benefits of this integration of brick-and-mortar stores with retailing. However, retailing over the Internet is not as simple as running a brick-and-mortar retail store. It is a different and challenging task. Some very important points should be kept in mind while deciding to go online for retail like the selection of an appropriate platform, integration with a logistics partner proper payment gateway, etc. E-tailing is a new concept in India. With limited internet users, this industry (retailing) is growing very fast and there is much to be achieved. Many growth drivers are in favour of e-tailing- demography, economy, changing lifestyle, exposure to new ideas, etc. Online shopping is not only more convenient for customers with hectic lifestyles but also gives a better deal for their money.

Self-Assessment Questions

1. What does the Term POS Stand for?
2. How can we define a POS?
3. What is an exampls for POS?
4. What are the different types of POS systems?
5. How does a POS work exactly?
6. Elaborate the term E-retailing and its importance in E-commerce.
7. Explain the different types of e-retailing

Assignments

1. Explain the functions of EPOS. Discuss the importance of EPOS in E-commerce.
2. Discuss the various models for online retailing
3. Suppose you are running an online retail store. Analyze how to make consumer-

oriented E-commerce more effective. What are the different components of consumer-oriented E-commerce that need to be considered?

4. What is Business-to-Consumer and how does it differ from Business-to-Business?

5. Visit any retail store and mention the channels they are using for their retail activities and try to find whether this store is a click and mortar retail store?

Suggested Readings

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

02 BLOCK

E-business Technologies

Block Content

Unit 1

Customer Relationship Management (CRM)

Learning Outcomes

After completing this unit, the learner will be able to:

- identify the role of E-business technologies in Customer Relationship Management
- examine the trends in Customer Relationship Management
- gain an idea on the e -CRM designs

Background

The customer is the king of every business. No business organisation can survive without satisfying the customer's needs. Customer satisfaction depends not only on the supply of materials but also on the extent of the availability of after-sale services. If the organisation can assist the customers in the long run, customers' loyalty towards the organisation will increase, which ultimately leads to the purchase intention of the customers. This practise of maintaining and assisting customers from the stage of marketing to a continuous stage even after selling the particular product or services to enhance the satisfaction level of customers is called Customer Relationship Management.

We are currently in a digital age. The conventional mode for buying and selling conduit for buying and selling products and services has transitioned to the digital realm. Nowadays, everything relating to marketing operations is carried out digitally, alongside traditional transactions. Businesses are consequently compelled to handle their clients using digital channels. This situation led to the development of e-CRM.

Keywords

CRM, e-CRM, CRM design, Trends in CRM

Discussions

2.1.1 Customer Relationship Management

- Customer Relation

For centuries, merchants and traders have practised customer relations. They base their company on trust. They tailor their products, delivery methods, and payment methods to meet the needs of their customers. They are willing to pay attention to their customers, recognise their tastes and preferences, and establish a personal rapport with them. In many cases, the interaction shifts away from the commercial transaction and into social interactions.

- Integration

An effective, standardised technique of tracking leads, contacts, chances, and client accounts, as well as the capacity to comprehend what is occurring at each stage of the sales cycle, are requirements for a successful E-commerce organisation. In other words, it needs a CRM solution that integrates seamlessly and gives each department synchronised data in real-time from a single source.

- ERP System

It is easy to contact clients with offers like sales, discounts, and special promotions when a customer database is created as part of integrated solutions. The E-commerce platform is where these promos are made, and the ERP system is informed of what it is getting and maintains track of it for upcoming reporting.

- Customer Loyalty

Customer Relationship Management encompasses more than just the customer. Other stakeholders are considered in various ways. But winning a customer's loyalty is not an easy feat. Creation that trusts between a customer and a business requires time, effort, honesty, value addition, and thoughtful brand building. Companies invest millions of dollars without knowing the basics of Customer Relationship Management in an effort to build a loyal customer base.

- Mass Production

Customers and merchants, artisans, and craftspeople still have this type of contact today, primarily in small, traditional markets known as pre-industries markets. But as a result of the industrial revolution, things change. Businesses that have embraced mass manufacturing, mass communication, and mass distribution in order to attain economics of scale, which is the phenomena where the average cost per unit of output decreases when a firm's output scales up or increases in magnitude.

- Gap between Customer and Producer

To cut costs, manufacturers began focusing on manufacturing and efficient operations. Intermediaries, such as distributors, wholesalers, and retailers assumed responsibility for warehousing, transportation, distribution, and final customer sales.

This increased efficiencies and reduced costs for manufacturers, but it also added many layers between them and their customers. As a result, the gap reduced direct contact and harmed their relationships.

Relationship practices resurfaced in the post-industrial era.

- Rapid technological advancements.
- Intense competition in most markets
- Growing importance of the service sector
- Adoption of total quality management programmes

Furthermore, combining E-commerce ERP and CRM results in an omnichannel commerce environment. Regardless of how customers purchase the product from the seller, the centralised CRM will associate each order with the correct customer. It provides a 365-degree view of how customers have previously interacted with the seller and how they are currently interacting with the seller. In a variety of ways, E-commerce has had a significant impact on CRM. It truly boils down to managing customer relationships and providing an excellent customer experience. Customer satisfaction and loyalty could be improved with E-commerce. Customer loyalty is influenced by the following factors:

- Application of Electronic Network

- Competency
- Capability to establish the relationship
- Commitment
- Solving the customer's problem
- Trust
- Quality of the relationship.

Implementing e-CRM is helpful since it can do all of the above, which will ultimately lead to happy customers, in addition to recording and storing client data round-the-clock, every day of the week.

Technology advancements in information, communication, and production have aided marketers in getting closer to their target audience. Companies in a variety of industries, from packaged goods to services, began utilising these technologies to get to know their clients, understand them better, and ultimately forge stronger relationships with them through repeated contact. Marketers were able to learn more about their target audience, which enabled them to better meet their de-

- Technological Advancement

mands through product development, shipping, and customer support. Technology has also made it possible to order and consume products and services.

- Customer Acquisition

Because businesses may use Internet technologies to track new customers' preferences and online behaviours, as well as to personalise support and services, CRM has evolved into electronic CRM (eCRM). Additionally, the combination of mobile Internet and wireless communication offers businesses the chance to communicate with their clients via a new mobile channel.

- Promotion

The front end of an E-commerce website for a business blends marketing, sales/service, and post-sales support. As a result, E-commerce websites are now effective platforms for acquiring, selling to, and keeping customers. E-marketing, which stresses proactive and interactive connections between businesses and their customers, actively uses the Internet to acquire new clients. Companies can inform potential clients about their goods and services on their websites. Advanced search functionality and functions for product and service inquiry can draw new and returning customers to the website, allowing them to compare goods and pricing and make purchasing decisions. In order to encourage social gatherings among current and potential clients, businesses also build online communities. Online product discussions and evaluations promote customer-initiated dialogue between businesses and clients as well as among clients. These online communities boost brand recognition, trust, and customer loyalty, which can enhance revenue and foster better client relationships.

- Accessibility

With the convergence of mobile internet and wireless communication technology, users now have "anytime, anywhere" access to information for work and personal communication. Mobile services facilitate m-commerce transactions and improve personal activity management, mobile office, and mobile operations. Mobile financial applications, location-aware and context-aware advertising, and location-based services appear to hold special promise among the many mobile applications proposed by wireless researchers. Individual users may benefit from customised support from these mobile services.

- Customer Retention

If you are an entrepreneur, a CRM system allows you to keep your customers' contact information up-to-date, track every interaction they have with your company, and manage their accounts. It is intended to assist you in improving your customer relationships and, as a result, your customer lifetime value. A CRM (customer relationship management) database is a resource that contains all client information that has been collect-

ed, governed, transformed, and shared across an organisation. It includes marketing and sales reporting tools, which are useful for leading sales and marketing campaigns and increasing customer engagement.

- CRM Infrastructure

By defining an integrated CRM vision, it is possible to build a CRM infrastructure. Suppose you are an entrepreneur, determine what services and products you will offer to your customers, as well as how you will track customer interactions. Rather than focusing on a single aspect, it is critical to consider the entire customer relationship. The next critical factor is understanding the customer. How does he or she use the current products and services that you offer? What does the customer think is good or bad about the current process? CRM helps to develop a business case. Examine your current situation and where you need to go. Do not use ineffective technology to justify inaction. There will always be technical flaws.

- Monitoring and continuous improvement

Building a CRM infrastructure places the entire project in the hands of a single manager. Collaborate with experienced business leaders and developers who know how to deliver and deploy integrated applications. Due to the cost complexity of CRM, a staged approach will increase the likelihood of success and allow for continuous strategy evaluation. Challenge the solution as well. In the real world, the usefulness and benefits of a CRM strategy change regularly. The CRM strategy's goal is to prevent information leakage. Ensure that all customer interactions, regardless of channel, purpose, or outcome, are recorded. Finally, establish specific measurement objectives. You will be able to monitor and ensure the project's success by using ongoing measurement and continuous improvement.

2.1.2 CRM Designs

- Pre-requisites of CRM

A good CRM provides a clear picture of the company's customers. Sales representatives can see everything in one place a simple, customizable dashboard that displays customers' previous interactions with the company, the status of their orders, any outstanding customer relation details, and more. This definition of a CRM demonstrates how complex this type of software is. CRM gathers a wealth of information under one roof and thus frequently strikes a balance between being useful and overwhelming for customers. CRM apps can benefit from product design. These CRMs all serve a different type of clientele, and the list of design examples includes solutions for small, medium, and large-scale businesses. These examples will assist you in understanding how to properly construct a CRM.

If you are an entrepreneur and are unsure about which CRM design is best for you, the following CRM designs suitable for various types of entrepreneurs will assist you in making the best choice.

- Large businesses

i. **Salesforce -** If your CRM solution is intended for large businesses, you could do worse than to learn from Salesforce possibly the most well-known CRM programme in the world. It can be customised indefinitely, adding functions to meet company-specific needs such as event planning, but this is usually quite complicated and necessitates the assistance of technical staff. Salesforce has a clean and laconic interface in neutral colours, which is a wise UX choice. The user's attention is drawn to the information displayed.

- Small Businesses

ii. **Hubspot -** Another major CRM system on the market, often compared to Salesforce, is designed primarily for small businesses. It lacks the functionality of its counterpart, but it is easier to use and tune to one's preferences. Hubspot distinguishes itself through its approach to incoming traffic. CRM solutions are typically built on the sales funnel principle: get as many clients (users) up on the rim as possible and sieve them down to the bottom line. Hubspot, on the other hand, employs a flywheel model throughout: the customer sits in the centre, and event managers, salespeople, and follow-up woo him with roundelays. This approach prioritises cultivating a long-term relationship for a higher LTV.

- Preferred communication channel

iii. **NetHunt CRM-** It's a platform with built-in Gmail and LinkedIn integrations that enables users to manage events, tasks, and the sales pipeline without leaving their preferred communication channel. Users can add recent leads with the click of a button or automatically from their inbox using this system. NetHunt will assist you in easily managing your email campaigns or events without the need to open another tab.

- Straightforward and minimalist design

iv. **Zoho CRM** - Zoho is a software company with about 45 SaaS products for small and medium-sized businesses. One of this company's best projects is Zoho CRM. It has a straightforward and minimalist design. When customers first use this system, Zoho CRM displays a beginner's guide. If users inadvertently click the wrong button, this CRM displays recent activity and allows you to undo steps.

v. **Monday Sales CRM** - This system was developed for a variety of businesses. When users begin to use new templates, it's critical that the programme displays learning blocks. Such a nice design solution makes it easier for newcomers to get used to this software. You can use this CRM's Apps Marketplace to connect platform features with other tools from well-known companies. There are, for example, connections to Facebook, Gmail, and Outlook.

- Learning Blocks

vi. **Fresh works CRM** - It is primarily an AI-based system for small and medium-sized businesses. On the one hand, some functions will be difficult to learn if users are unfamiliar with complex analytical tools. Customers, on the other hand, can benefit from pre-installed automation templates. Newcomers, for example, can use event management, autoresponders, and welcome emails for new subscribers.

- Small and medium-sized businesses

vii. **AmoCRM** - This is a sales department-focused CRM system with straightforward design solutions. The interface allows you to sort deals by hanging, inactive, or closed status. Calls are automatically added to the database, and the database is segmented by client type.When this solution is launched for the first time, it displays hints to assist users in learning their way around the workspace and the sales process itself. For example, when the first potential deal or event comes in, Amo will go over the sales funnel in great detail.

- Sales department-focused CRM

viii. **Retail CRM**- This programme was designed with online shopping in mind. It is capable of connecting to E-commerce engines, downloading product and order information, and updating order data in both directions in real time. Leads are generated directly from social media and messaging apps.

- Online shopping

ix. **Pipedrive-** This Estonian startup has become a "unicorn." The developer positions its CRM solution as a small business suite. Pipedrive's abundance of plug-ins enables it to be configured to meet the needs of a business in a flexible manner. Event planners, for example, can manage event calendars in the system.On top of the side panel, the sales funnel and leads are highlighted and separated. Every new lead is automatically routed to the funnel, and the entire process can be managed through a simple and user-friend-

- Flexibility

ly interface. Its scheduler also allows customers to plan events.

x. **Envy CRM** - According to the developer, this is a super-easy CRM with a simple design that does not require pre-training for sales and event personnel. When moving from stage to stage in the deal-making process, Envy automatically loads tasks for customers: the call is over writing a call resume schedule the next call. The customer will not be abandoned in the middle because the manager makes a mistake.

- Super-easy CRM

xi. **YClients** - This CRM system is aimed at beauty salons, clinics, gyms, and other businesses in the service industry. It allows you to notify clients about appointments and events via instant messaging and e-mail, and you can cancel and reschedule online.

- Service industry

xii. **S2** - A solid CRM system for medium and small businesses. It generates tasks for each stage of the sales funnel, reminds customers of deadlines, provides checklists with tips to sales or event managers, and sends SMS updates to customers about the status of their orders. Everything is done inside one window, as in Retail, but the design is much more turgid. The icons are on the sides of the screen, and the navigation panel is on top.

- Medium and small businesses

2.1.1.1 Essentials of CRM design

The interface of the future CRM solution will reflect the program's goals and scale as defined by the organisation. Small businesses require more slightly different functions than large corporations. Nonetheless, there is a basic set of CRM design features that they all attempt to include

i. **A staged sales funnel-** The basic CRM lens through which a company's efficiency in bringing money can be assessed is the sales funnel. All customers must travel these Dantean circles: from the moment their attention is drawn to an offer to booking, confirmation, and payment. That concerns events too. These stages of the transaction should be depicted as simply as possible. Literally drawing a funnel up there can't be beaten.

- Sales funnel

ii. **An intuitive workspace-** Make an effort to save users a night in bed with the programme. A CRM system should not be compared to a wardrobe with clapping side panels. The user must immediately understand where the statis-

tics are and where the events calendar is. Icons should be captioned.

iii. **Convenient searching**- Even if this system's CRM design is to be as plain as Pipedrive's, it still needs in-depth, flexible searching of deal and customer data. This will save the salesmen and event organizers the time they would spend looking for tasks and clients. If you can include drop-down suggestions, all the better.

iv. **A team calendars**- All CRM design solutions allow synchronization with Google Calendar and similar services. The bigger the company or project, the more important such common events' calendars become. Let's say that a customer wants to meet with the sales and event departments tomorrow. Instead of writing to every team member's work email he can set up the event in the calendar, and they will all be notified in their CRM accounts.

- common events' calendars

v. **Custom filters for deals, orders and clients**- When the system is designed to sort through large amounts of data, it must include methods for filtering out the irrelevant bits with quick filtered searches. These custom design filters can assist in tasks such as zeroing in on a specific client who needs to be contacted and reminded about his order. Custom filters neatly separate data into relevant lists, such as rescheduled events.

- Filters

vi. **Real-time analytics and reports-** These should be in the form of easily digestible graphs, charts, and tables containing detailed data, such as the number of products sold last week, resold items, order data, and so on. Superiors will find it easier to understand specific subordinates' performance with such a tool, while salespeople and event managers will be able to devote their time to more pressing tasks.

- Easy to understand

vii. **Thought-out document templates-** When it comes to paperwork, having documents ready to fill out can save a lot of time. For example, make it so that once a customer's wholesaler information and upcoming event data is provided, it is automatically entered into all relevant forms.

viii. **An integration-supporting API interface-**Allow this programme to integrate with the company website, internal software, apps and messengers, and social networks such as Telegram, WhatsApp, and Instagram. Such

a solution will aid in the more effective management of events.

2.1.3 E-CRM Infrastructure

- Provide valuable Information

The longer a customer stays with a company, the more likely they are to increase their purchases. Customer satisfaction can help increase customer life, so businesses must improve their customer competitive advantage. Companies that are dedicated to CRM activities will carry them out effectively, which will ultimately result in increases in corporate profits. Because good CRM implementation contributes to a company's profitability, CRM analysis of the CRM process, which provides information about customers and thus benefits the company, will support company economic performance.

- System Effectiveness

CRM technology infrastructure should prioritise software and hardware availability, technical support, data completeness, and data availability across channels. Employees will benefit if it is implemented correctly. The quality and quantity of customer data input determines the effectiveness of the CRM system, which is based on the quality and quantity of customer data input.

2.1.4 E-CRM Infrastructure Requirements:

- Elements of e-CRM infrasructure

Integration of all business function software's is a must for organisations. Customer data computing architecture, business rules for coordinating interactions, and systems and processes that facilitate integration of legacy, analytic, and operational CRM systems are the three fundamental elements of e-CRM infrastructure. A well-established E-CRM infrastructure should allow you to:

- Integrate multiple customer contact points
- Define new business processes and data
- Add new system applications and components
- Support multiple users simultaneously
- Add new data sources

Let us examine the four types of business integration required for an effective e-CRM infrastructure. The four enabling technologies for integrating systems are:

i. **Integration of Customer Content -** Without a thorough understanding of customer service requirements, a company can only provide mediocre service. Previously, a few

companies collected a lot of customer data but did not know how to classify and use it to their advantage. As a result, proper management, structuring, and integration of customer information is critical. Companies have begun to structure, integrate, and use customer data to derive meaningful results since the introduction of e-CRM. Organizations will be able to provide better customer service as customer information is integrated.

- leveraging customer information

ii. **Integration of Customer Contact Information -** Contact management is the process of capturing, sharing, and storing customer information electronically and making it available to the entire organisation. Contact management provides numerous opportunities for customer communication for various departments within a company. The Internet, call centres, and other electronic channels can be used to answer customer inquiries. Contact management can be a powerful tool. It ensures the availability of up-to-date customer information. Furthermore, contact management centres can make customer information available 24 hours a day, 365 days a year. To respond to information requests, both online and offline, these centres use a centralised database. Keeping track of previous transactions will help to eliminate inconsistencies in contact management.

- Centralised Database

iii. **Integration of the Extended Enterprise -** Cross-functional process integration is becoming increasingly important as the emphasis on providing excellent customer service grows. The Internet allows businesses to integrate their sales and service. Organizations must look beyond the integration of their own business processes and focus on improved collaboration and sharing of customer information with their vendors and business partners. Organizations must use inter-enterprise integration applications to benefit from extended enterprises. These applications will allow for simple communication and collaboration with vendors and partners via the Internet.

- Inter-Enterprise Integration Applications

iv. **Integration of Systems** - Organizations require a comprehensive CRM solution that allows them to gain a thorough understanding of their customers. This necessitates the incorporation of phone, web, and database technologies. In this context, integration refers to the complete

- Sales and Service Integration

product and service information that is shared across multiple delivery channels.

2.1.5 Steps to Building CRM Infrastructure

i. Create an integrated CRM vision: Determine what services and products you want to provide to your customers, as well as how you intend to track customer interactions. It is critical to consider the entire customer relationship rather than focusing on a single aspect.

ii. Know your customer: How does he or she make use of the current products and services you provide? What is good or bad about the current process in the eyes of the customer?

iii. Create a business case: Analyze where you are now and where you need to go. Do not use poor technology to justify inaction. Technical flaws will always exist.

iv. Assess current readiness: Determine the position of your company in relation to the competition. Examine existing sales and service infrastructures' ability to acquire and retain existing customers.

v. Define the CRM strategy and specific goals: Adopt a strategy that is consistent with the overall strategy of the company. Include marketing, sales, and service organisations, and learn how they interact with customers. Inquire about current and upcoming product and sales offerings.

vi. Evaluate appropriate applications with an uncompromising focus on ease of doing business: Ensure that the applications meet today's needs and the strategic direction of the firm. Look at the applications from an integrated viewpoint.

vii. Take the customer's view, not the product or account view: After selecting an application, ensure that the process redesign will benefit and retain the customer.

viii. Identify and target quick wins. Set aggressive and realistic milestones: Accomplish attainable objectives early in the process to build support and ensure completion. This allows you to implement incrementally and successfully. Celebrate your successes along the way.

ix. Put the ownership of the end-to-end project in the hands of a single manager: Partner your team members with experienced business leaders and developers who understand how to deliver and deploy integrated applications.

x. Implement in stages: Due to the cost complexity of CRM, a staged approach will offer a greater chance of success and allow for continuous evaluation of strategy. Also, challenge the solution. The usefulness and benefits of a CRM strategy constantly change in the real world. Be ready for it. Be proactive about change.

xi. Be sure to create a closed-loop CRM environment: The goal of the CRM strategy is zero leakage of information. As customers contact the company, regardless of the channel, purpose, or outcome of the interaction, make sure it is captured.

xii. Finally, create concrete measurements goals: Through ongoing measurement and continuous improvement, you will be able to monitor the project and ensure its success.

2.1.6 CRM Trends

Trends in Customer Relationship Management are as follows;

i. **AI Powered customer support** - Machine learning, predictive analytics, natural language processing, and robotics are all examples of artificial intelligence (AI). CRM vendors have been investing in acquiring, and developing capabilities that use artificial intelligence to optimise customer interactions. As predicted, artificial intelligence will have grown significantly by 2022. According to a Salesforce statistic, marketers using AI increased from 29% in 2018 to 84% in 2020. AI is expected to influence CRM strategies and boost global revenue by $1.1 trillion by the end of 2022. In this rapidly expanding scene, we see AI assisting CRM platforms in the following ways:

- Various AI tools

a. **Customer service:** As AI chatbots handle more service requests, information is now being captured and leveraged via CRM applications. Assume a web chat is used to initiate an auto insurance claim. During task completion, the chatbot gathers necessary data, such as the customer's name, and authenticates the customer and vehicle. When the data is collected, it can be passed to a human associate to complete the insurance claim process. Bots are trained and can learn from feedback based on the satisfaction of the interaction with the customer. A bot's feedback loop can lead to improvements after each interaction.

b. **Lead management:** A sales team can use AI to score

a lead, increasing the chances of a closed sale. First, AI analyses the lead and can provide a score and recommend what steps are required to increase success based on interest or purchasing history.

c. **Next best action:** By utilising business rules and predictive models, AI embedded in CRM software can recommend steps to sales or service associates to assist with service requests or upsell opportunities. AI analyses the information associates enter into the CRM service request as they handle customer calls. Based on certain criteria, the system suggests to the customer a sell offer, an add-on product, or a service. The offers would not be generic, but rather tailored to the needs or circumstances of the individual customer. The idea is that the associate will not have to remember to make an upsell offer because that information will be provided to them in real time.

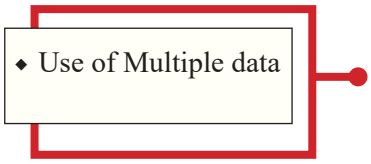
iv. **Process Automation Advances-** CRM has been used by organisations to automate basic work flow, in which events trigger an action. If a service request was previously opened and the status changed to closed, a workflow rule could specify that an email be sent to the customer informing them that their case has been closed. Workflow is a fundamental component of the majority, if not all, CRM platforms. Several new CRM trends have emerged in terms of automation capabilities:

- Work Flow

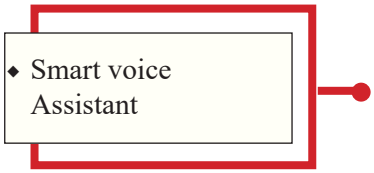
a. **Task Automation:** Defining work tasks and deciding whether they should be performed by a machine or a human enables organisations to better serve their customers. Task automation also provides step-by-step instructions on what actions to take. During an associate's interaction with a customer, the CRM system will direct or guide the associate on what to say and do to inform the customer. Task automation is structured and prescriptive in terms of what steps to take based on input received, customer profile, or other business conditions.

b. **Work Distribution:** Task automation specifies process flow and tasks to be performed and may identify that certain tasks must be performed by other resources based on the availability of skilled employees. Another capability within Process Automation that is trending in CRM platforms is the ability to distribute or route tasks.

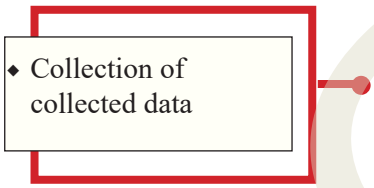
iii. **Data integration** -CRM systems generate and use enor-



mous volumes of data. In the past, corporate systems including ERP, accounting, claims processing, and billing systems that retrieve transactional data have been connected with CRM technology platforms. An Enterprise Service Bus (ESB), Application Programming Interfaces (APIs), file integration, Computer Telephony Integration (CTI), and others have been used as integration technologies. The emergence of third-party systems and the Internet of Things (IoT) are two trends in CRM with referenc to integration.



iv. **Voice technology**- Amazon Alexa and Google Assistant have inspired a plethora of new applications for voice technology, ranging from home automation to security systems. It's no surprise that smart voice assistants may soon be added to CRM platforms, as more than 90% of users believe this technology can help them not only save time but also improve their quality of life. It is assumed that integrating CRM systems with voice assistants will make it easier to track tasks, provide quick access to information through voice commands, allow data transfer and notify colleagues about changes in customer data, and, in general, save employees' time.



v. **Blockchain**- A blockchain is a growing collection of connected data known as blocks. They establish an open, decentralised ledger that records parties' transactions and is completely verifiable. But what connection exists between CRM and blockchain? Here are a few examples of how it benefits CRM:

a. **Security:** The security feature of blockchain assigns network keys that prevent unauthorised access. Cloud security has improved as a result of CRM platforms being on the cloud, but it is still based on a centralised security system strategy. Blockchain is disseminated through synchronisation using a peer-to-peer networking strategy that is decentralised. Fraudulent attempts are much harder to detect. When it comes to CRM and the need for sensitive, secret, and highly confidential data, this becomes a very attractive value proposition.

b. **Transparency:** Blockchain is decentralised and does not require a middleman to verify transactions, such as a bank or other third-party broker. This quickens the process of engaging customers in a secure and transparent manner.

c. **User control:** Blockchain secures and encrypts person-

al data, verifies access without disclosing any details, and limits the amount of data that may be accessed. CRM systems will essentially subscribe to client data in accordance with each grant right. As opposed to present CRM systems that give unrestricted access to personal data without any user control, users will have the control.

d. Clean data: Who is sick and weary of your data being wrong in other organisations' CRM databases? Customers become frustrated by duplicates, incorrect addresses, incorrect emails, and other factors. Without actually disclosing the information to the inquirer, blockchain can store and encrypt personal data and confirm details upon query (such as a mobile phone carrier validating your address or current employer). Blockchain would verify the consumers' submitted address complies with the mobile phone company's need for a valid servicing address rather than storing the address they provided.

Customers can create their own personal blocks on blockchain, which provide businesses access to a completely accurate profile of their identity, prior transactions, educational background, and credit reporting. Customers and businesses that can easily access such data now have a more reliable source of data.

v. **Beginner friendly CRM**- You no longer have to spend hours sitting down to comprehend the system in order to work with a multipurpose CRM assistant. There are already more straightforward choices available that are equally as capable as more complex CRMs. These options can also assist cut down on the time needed for employee onboarding and help achieve goals much more quickly.

vi. Mobility and accessibility-The pandemic of 2020 has heightened the urgency of this reality. Work must be done to keep economies and industries from collapsing while the entire planet is under siege. Given the pressure on businesses to adapt quickly, the concept of remote working does not seem so far-fetched.Personnel must be dispersed further as company procedures become more complex. Furthermore, customers expect more from sales representatives. The only way to accomplish this is to give employees access to CRM. Making it simple for them to complete their tasks while on the go and access the programme from anywhere will help the brand's success.

Summarised Overview

Customer relationship management aims to increase customer loyalty in order to boost profitability. CRM is intended to improve all aspects of customer service. CRM tactics can be built around the acquisition-retention-extension model of the ideal company-customer relationship. Traditional online mass-media techniques and specialised online techniques, such as search engine optimization, link-building, e-mail marketing, and banner advertising are examples of marketing communication techniques used to achieve acquisition, retention, and extension. Knowledge of online buyer behaviour, particularly the changing needs of the customer at various stages of the purchasing decision, can be used to improve CRM management.

Sef-Assessment questions

1. What is CRM?
2. What is e -CRM?
3. Explain the Order Acquisition Process.
4. What is blockchain?
5. What are the two trends in CRM concerning integration?

Assignments

1. What are the goals of acquisition and retention in an online context?
2. How can an E-commerce site be used to achieve extension in CRM?
3. Examine the relationship between customer satisfaction, loyalty, and sales about pureplay E-commerce site.
4. Explain a range of techniques for attracting repeat visits to a website.

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

Unit 2

Enterprise Resource Planning (ERP)

Learning Outcomes

After completing this unit, the learner will be able to:

- identify the forces that influence ERP
- analyse the ERP implementation strategies
- identify the ERP trends

Background

In today's fiercely competitive business environment, there has to be much greater interaction between customers and manufacturers. This means that the company needs to have strong relationships with both suppliers and customers to manufacture goods that are customised to meet client needs and deliver them more quickly. Manufacturers must have effective planning and control systems that enable excellent synchronisation and planning in all organisational activities if they are to attain this increased delivery performance.

Strong integration throughout the value chain is also necessary. Thus, to give the company a competitive edge in an unstable business climate, a standard software package is required. This software gives the company the tools it needs to combine and synchronise the discrete functions into streamlined business processes. The majority of businesses worldwide have realised that it is impossible to develop and maintain a custom software package that will meet all of their needs and be current in an environment that is changing quickly. Some of the top software developers have created Enterprise Resource Planning software, which provides an integrated software solution for every aspect of a business, after realising the needs of user organisations.

Enterprise Resource Planning (ERP) is the largest high-end solution, information technology has lent to business applications. To maximise an organisation's information-based resources: men, material, money, and machinery the ERP solution aims to optimise and integrate business operations and information flows. Due to the exorbitant cost, only large multinational corporations and infrastructure businesses could initially afford to deploy ERP packages. Currently, a large number of Indian organisations are implementing ERP. It is anticipated that shortly, 60% of businesses will have implemented an ERP system, as it will become essential for obtaining a competitive edge.

Keywords

ERP, Forces of ERP, Trends

Discussions

2.2.1 Enterprise Resource Planning (Erp)

ERP will be looked upon as the foundation for digital transformation

-Nick Castellina (*Vice President of Go to Market Management, infor*)

- Intergration of activities

Enterprise Resource Planning (ERP) is a process used by businesses to manage and integrate the critical components of their operations. Many ERP software applications are important to businesses because they aid in resource planning by integrating all of the processes required to run their businesses into a single system.

An ERP software system can also integrate planning, inventory purchasing, sales, marketing, finance, human resources, and other functions. Consider an enterprise resource planning system to be the glue that holds the various computer systems of a large organisation together. Each department's system would be optimised for its specific tasks if there was no ERP application. Each department retains its own system with ERP software, but all systems can be accessed via a single application with a single interface.

- Benifits

ERP applications also make it easier for different departments to communicate and share information with the rest of the company. It gathers information about the activity and state of various divisions and makes it available to other parts where it can be used productively. ERP applications can help a company become more self-aware by connecting data from production, finance, distribution, and human resources. An ERP application can eliminate costly duplicates and incompatible technology because it connects different technologies used by each part of a business. Accounts payable, stock control systems, order-monitoring systems, and customer databases are frequently integrated into a single system.

2.2.2 Features of ERP

ERP has the following main features

- ERP provides multi-platform, multi-facility, multi-mode manufacturing,
- ERP includes multi-currency, multi-lingual facilities.
- It supports strategic and business planning activities, operational planning and execution activities, creation of materials and resources. All these functions are effectively integrated for flow and update of information immediately upon entry of any information.
- It has end to end Supply Chain Management to optimise the overall demand and supply data.
- ERP facilitates company-wide integrated Information System covering all functional areas like manufacturing, selling and distribution, payables, receivables, inventory, accounts, human resources, purchases, etc.
- ERP performs core activities and increases customer service, thereby augmenting the corporate image.
- ERP bridges the information gap across organisations.
- ERP provides complete integration of systems not only across departments but also across companies and the same management.
- ERP is the solution for better project management.
- ERP allows automatic introduction of the latest technologies like Electronic Fund Transfer (EFT), Electronic Data Interchange (EDI), Internet, Intranet, Video conferencing, E-commerce etc.
- ERP eliminates most business problems like material shortage, productivity enhancement, customer service, cash management, inventory problems, prompt delivery, etc.
- ERP provides intelligent business tools like decision support system, Executive information system, Data mining and easy-working systems to enable better decisions.

2.2.3 Integration of IT system

IT advancements have transformed the business process in an extended-enterprise system by enabling seamless integration at the interfaces of functions and hierarchies. IT (informa-

- Information transfer

tion technology) is a critical enabler of effective supply chain management. Typically, applications span the entire enterprise and beyond, including suppliers on the one end and customers on the other hand. The scope of information technology includes both internal to a single company and external systems that facilitate information transfer between different companies and individuals. According to recent studies, companies that invest primarily in business processes outperform those that invest solely in information technology and lack the necessary business processes. Only investing in technology without also investing in appropriate business processes results in negative returns.

- Automation of Functional activities

ERP systems integrate both internal and external management information across the entire organisation. These systems are intended to cover all functional areas (finance/accounting, manufacturing, sales and service, customer relationship management, and so forth). ERP systems use integrated software applications to automate functional activities. Their role is to facilitate the flow of information between all business functions within the organisation's boundaries and to manage the connections to external stakeholders. The ultimate goals are to gain a competitive advantage, reduce operational costs via business process integration, and improve asset management via system automation / cross-organisation visibility.

Changing role of IT in Enterprise Modelling are as follows:

Table 2.2.1

ERP Integration

Earlier Trend	Intervening Trend	Emerging Trend
Limited role of information technology.	Use IT information in system designs, computerisation of major activities, automation, etc.	Seamless integration of enterprise through IT support.
Manual data analysis without IT assistance.	Computerization and networking with limited IT assistance.	With the assistance of effective IT tools Integrated network.
MRP	MRP II	ERP
At any given time, information appears and can be accessed from only one place.	Shared databases, electronic mail, client server architecture.	At the same time, one can access the same information from any location and at any time.
Only an expert can complete complex tasks.	Expert systems, neural computing.	Able to perform complex work.

A company's operations must be either centralised or decentralised.	Telecommunication and networks: client/server.	Business can be both centralized and decentralized.
Managers make all decisions.	Decision support systems, enterprise expert systems.	Decision making is part of everyone's job.
Field personnel require offices to receive, send, store, and process data.	Wireless communication and portable computers, information highways, electronic mail.	Information can be managed by field personnel from any location.
Personal contact is the best contact with potential buyers.	Interactive video disk desktop teleconferencing, electronic mail.	The best contact is the one that is most cost effective.
One has to locate items manually.	Tracking technology, groupware, workflow software, client/server.	Items are located automatically.
Overall plans get revised periodically.	With the help of high-performance computing systems plans get revised.	Plans get updated instantaneously.
All must come to one place to work together.	Groupware and group support systems, telecommunications, electronic mail, client server.	People can work together while at different locations.
Customised products and services are costly and time-consuming to develop.	CAD-CAM, CASE tools, online systems for JIT decision making, expert systems.	Customised products can be produced quickly and affordably (mass customisation).
A long period of time is spanned between the inception of an idea and its implementation (time-to-market).	CAD-CAM, electronic data interchange, groupware, imaging (document processing).	Time-to-market can be reduced by 90 per cent.
Information-based organisations and processes.	Artificial intelligence, expert systems.	Knowledge-based organisations and processes.
Move to countries where labour is cheap (off-shore production).	Robots, imaging technologies, object-oriented programming, expert systems, Geographical Information Systems (GIS).	Work can be done in countries where facilities are available.

2.2.4 Erp Implementation

- ERP team

ERP implementation is typically done in close collaboration with the vendor who supplies the package. Many businesses hire professionals/consultants to help with the implementation process. An ERP team must be formed within the organisation. This team is made up of people of high calibre and motivation. They come from different backgrounds. This team will undoubtedly include process engineers, industrial engineers, HRD personnel, financial executives, and work managers. The role of top management is critical because commitment and the required flow of finance are the two major ingredients without which no effort is futile.

- Deployment of ERP

Regardless of whether it replaces an existing on-premises solution, expands the functionality of an existing cloud environment, or is a greenfield deployment that replaces disparate spreadsheets and custom software, the implementation of an ERP system is a crucial step for any organisation that has decided to deploy a new enterprise system. No matter what kind of new ERP system is chosen, a successful deployment is necessary for the enterprise solution to be successful in terms of user adoption, process alignment, data quality, and enterprise fit.

- Facilitate ease of use

The degree to which users, vendors, and implementation consultants collaborate to meet the organisation's goals as a whole determines the effectiveness of an implementation. The needs of the users and the current business realities must be understood by the implementation consultants, who must then build the business solutions with these considerations in mind. Since the users will be leading the implementation, their active participation at every level of the process is essential to its overall success.

During deployment, an ERP solution should enhance information flow and formalise and standardise all company workflow and business processes. Nonetheless, consumers' workloads might not get much lighter. It's important to keep in mind that ERP is a tool that facilitates better work, which requires more work.

- Customised software

The standard package may change during implementation; these changes could be minor or significant "functionality" modifications. Customisation is the act of putting such changes into practice. The package's contents are referred to as modules which are further subdivided into components. However, since any modification to one functional module may negatively affect the operation of the other modules in the package, it is always preferable to meet user requirements and overall

objectives within the constraints of the current package. Only when the standard package is implemented in its entirety with the goal of optimal utilisation will the maximum advantage be realised.

Employee roles and duties must be precisely defined, comprehended, and set up in the system. The ERP system's new processes and procedures must be accepted by the staff. These procedures and processes also need to be easy to understand and simple to use. An essential need for the organisation is that the ERP package be able to handle and support constantly changing business processes; as such, the package should be flexible and extendable to accommodate these changes. An ERP package that is properly managed and executed can offer a 200 percent return on investment, whereas one that is badly executed can only achieve a 25 percent return on investment.

- Flexibility

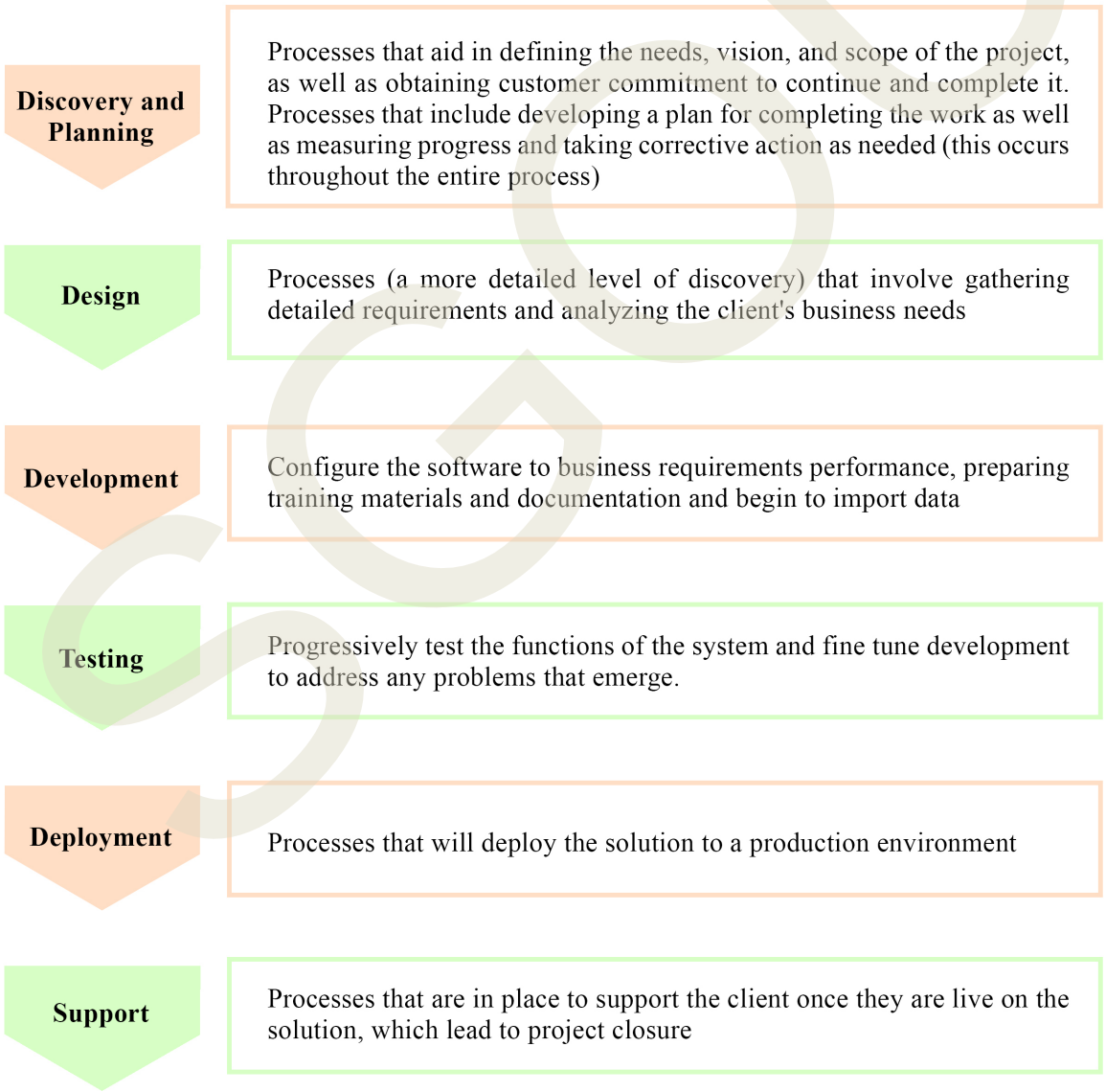


Figure 2.2.1 Process of implementation of ERP

2.2.4.1 Process of ERP implementation

A typical ERP implementation plan can be divided into six phases, each with specific objectives. Every business is unique, so the phases may vary somewhat depending on the company, and they also may overlap. The six-part ERP implementation phase lifecycle includes discovery and planning, design, development, testing, deployment and support.

ERP implementation

i. **Discovery and Planning-** What exactly is the first stage of ERP implementation? This includes conducting system research and selection, forming a project team, and defining detailed system requirements. The project team will be responsible for a wide range of implementation roles, such as laying out the project plan and target dates, allocating adequate resources, making product and design decisions, and day-to-day project management. During this phase, the team may choose and acquire an ERP system as the organisation develops a clear understanding of its needs. One critical decision is whether to use an on-premises or cloud-based ERP system. You purchase and install hardware and software in your organization's data centre for an on-premises system. Cloud-based ERP, on the other hand, is typically delivered as a subscription service accessible via the internet, making it easier to implement and requiring fewer in-house IT skills.

ii. **Design** - Based on specific requirements and knowledge of existing procedures, the design phase develops a comprehensive plan for the new ERP system. This entails developing entirely new, more efficient workflows and other business procedures that make use of technology. Users should be involved in the design process because they are the ones who are most familiar with the existing business processes. Involving them in the design process also increases the likelihood that they will accept and utilise the new system.

iii. **Development-** The development phase can begin once clear design requirements have been established. This entails configuring and, as needed, customising the software to support the redesigned processes. It may also include developing integration with any other existing business applications in the organisation that will not be replaced by the ERP system. If you use an on-premises ERP system,

the organisation must install the required hardware and software.

iv. **Testing-** Testing and development can take place at the same time. The project team, for example, may test specific modules and features, then develop fixes or adjustments based on the results and retest. Alternatively, it may test one ERP module while another is still being developed. Initial testing of the software's basic functions should be followed by rigorous testing of the system's full capabilities, including allowing some employees to test the system for all of their day-to-day activities. This phase should also include testing of the migrated data as well as basic end-user training. To begin user training, most vendors can provide pre- and post-deployment tools. However, in addition to vendor assistance, the organisation should make good use of the training materials developed during the development phase. There is real value in resources that are tailored to your end-users daily responsibilities.

v. **Deployment-** This is what you've been working toward: the launch of the system. Be prepared for problems, as there may be many moving parts and some confused employees, despite your best efforts to prepare them for the change. The project team should be available to answer questions, assist users in understanding the system, and attempt to resolve any issues. If necessary, your implementation partner should be able to assist with troubleshooting. Users may need some time to adjust to the system and achieve the expected productivity gains.

vi. **Support-** After deployment, nurturing your ERP implementation helps to keep users happy and ensure the business achieves the desired results. During this phase, the project team will still be in charge of the ERP system, but its focus will shift to listening to user feedback and adjusting the system accordingly. As new features are added to the system, some additional development and configuration may be required. New employees must also be trained on the system.

2.2.5 Forces Influencing Erp Implementation

For many businesses, the long and sometimes tedious process of selecting an ERP system pales in comparison to what comes next - ERP implementation. It is as important as se-

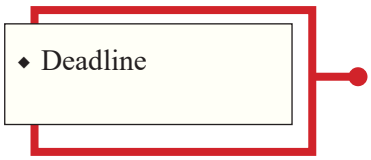
lection, though implementation is widely regarded as a more complex and daunting project that can be quite disruptive to a business, especially if things go wrong. That can be validated simply by reading the numerous horror stories in the industry press about massive-scale ERP failures experienced by some of the world's most recognisable brands. The social media sphere takes this a step further, with countless blogs, tweets, and postings from users lamenting unmet ERP expectations. It's not surprising, then, that most businesses are nervous about an upcoming ERP implementation. While almost any ERP implementation can be complex and difficult, a successful implementation can be the norm rather than the exception.

Market analysis and industry research have thoroughly investigated the primary root causes of the majority of ERP failures over the years. Proactively addressing these causes will undoubtedly help ensure that an ERP project ends as a success story rather than a failure, which can cost a company untold sum of money, wasted time and resources, and harm the bottom line. The top critical success factors are listed below, and they directly address the root causes of ERP failures and provide a framework for a successful implementation. These are not revolutionary or even novel ideas, but rather ones that users I have used for hundreds of successful ERP implementations in a variety of industries. These success factors have been tried and tested, and they provide real-world consulting insight into the most difficult of IT projects: ERP implementation. The following success factors are critical to the successful deployment of an ERP solution:

- Support from top level management

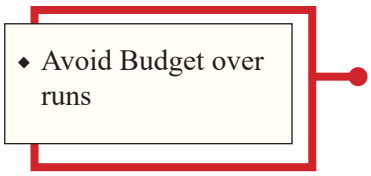
i. **Strong Executive Sponsorship-** Executive sponsorship implies that upper management is involved throughout the implementation process. Setting up a steering committee-comprising of a company's CEO, CFO, CIO, and other key upper management executives at the start of the implementation project is one way to accomplish this. Through monthly meetings, executives will gain a thorough understanding of the overall project scope, budget, milestones, and key deliverables as members of this committee. That way, key executives can create a vision for success, approve necessary resources, motivate the project management team, and make high-level, sometimes difficult decisions, particularly if an employee is impeding the success of the implementation.

ii. **Focused Project and Scope Management**- ERP implementations have strict deadlines and resource constraints, and any unapproved or unvetted changes in the scope of



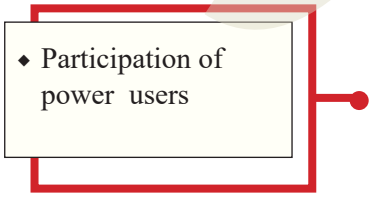
the project, such as additional software modifications and customizations, can affect the cost of the implementation and, ultimately, its success. The project's scope must be clearly defined and managed to avoid confusion, delays, and cost overruns, which will ultimately affect the total cost of ownership.

iii. **Minimize / Eliminate Customizations-**Since modifications are frequently the main causes of substantial budget overruns and delays in achieving project deadlines, both of which can dramatically increase the total cost of ownership, this element alone can greatly alleviate a lot of management difficulties. More importantly, customizations or alterations can make it more difficult to support and upgrade the software in the future and can affect practically every aspect of implementation, including user processes, user training, and the development and testing phases.



iv. **Approved Solution Design-** The tone and strategic approach for the entire implementation are established by the solution design. The steering committee and designated business unit managers are responsible for approving the solution design early in the project. Other phases or work segments of the implementation, such as detailed design and configuration, data migration and development, system testing, deployment, and mock go-live, are dependent on the solutions design's approval; otherwise, the project should not proceed. However, in some cases, the design and development of well-known or previously identified key software enhancements can proceed as long as they are not impacted by key business decisions identified in the solution design.

v. **User(Subject Matter Expert) Participation and Egagement-** The SMEs and certain authorised users, referred to as the Power Users, are better acquainted with their existing business procedures and how their organisation runs than any consultant. They must participate from the start in project meetings, discussions, hands-on implementation tasks with consultants, and choices being made regarding both the system's functional requirements and its implementation as a whole.



vi. **Process Owner Led User Training and Sign-off-** The success of the new ERP system depends

- Acquaintance with new system

on its users' education and learning of it. Training their own end users on the business process flows (and modifications) that they helped build and implement is one of the finest ways for power users and SMEs to better acclimatise themselves with the new ERP system. The ability of department heads/leaders or process owners to effectively explain to end users why certain decisions were taken, why the business process flows differently than it did in the past, etc. will be one of their many newly acquired talents. The process owners are expected to sign off when user training is finished, validating and confirming their responsibility and commitment to making sure the end users in their respective departments have finished the necessary training to be independent when they launch on the new ERP system.

vii. **Documented User Procedures**- Typically, the Power Users or selected business managers work side by side with the consulting team and/or immerse themselves in the functionality, training materials, and system testing to record how the processes operate within the ERP system. The designated business managers in charge of creating the user manuals and technical guides that will be crucial as staff members who learn the system will eventually make use of this content. If a consulting partner is hired to help with this process, they will probably be able to offer templates as a manual on how to record these user routines in a common and understandable format.

- User manual and guidelines

viii. **Targeted Data Migration Strategy**- Data migration is typically held accountable when the project timeframe is not met because it is generally seen as the most time-consuming of all the implementation operations. The data migration process is streamlined with the aid of a well-defined data migration plan. The plan will cover the procedures and actions involved in moving the data, including the instruments used to upload the data as well as the data elements, volume, history, and means/mechanism for cleaning and consolidating it. The plan will specify how the data will be given, the mapping rules, the volumes, the tables that will be used to store the data, whether a staging environment will be required in the meantime, and how the data will ultimately enter production.

- Plans for moving data

- Ensuring that the demands are met

ix. **System Testing-** Any successful installation needs to go through a rigorous testing process to ensure that the system is not only functional but also meeting the demands of the business and delivering the desired results. Companies have a tendency to reduce the quantity and quality of system testing during the implementation if timeframes are tight and there are budget overruns early on. This is a terrible notion since shortening any testing cycles raises the possibility that crucial features that fulfil the system's essential business needs were left out.

- Continues throughout ERP system s ' life cycle

x. **Knowledge Transfer-** This success factor should be viewed as a process rather than a milestone in an IT project. Knowledge transfer begins at the very beginning stages of implementation and continues past the Go-Live stage. Throughout the ERP system's lifecycle, knowledge transfer should take the form of classroom instruction, project-specific workshops, solution design sessions, functional specification reviews, one-on-one "how to" sessions, e-learning, and how-to videos for new and existing workers.

2.2.6 ERP Trends

People in the modern era will not allow rigid system solutions to stymie holistic digital transformation. This holds for the vast majority of them, including enterprise resource planning (ERP) software. In this light, staying up to date on the latest ERP trends benefits both consumers and service providers. Furthermore, as the COVID-19 pandemic necessitated more stringent business continuity and risk management strategies, understanding how the organisation can make the most of technologies such as ERP software has become essential. The following are ERP trends:

i. **Cloud ERP-** Modern platforms, as opposed to legacy or on-premise systems, are migrating to the cloud. The cloud enables vendors and resellers to host the programme and client data on third-party servers that are accessible via the internet. There are no installation requirements, and able to access critical information from any device in any location.

ii. **Two-Tier ERP-** Two-tier ERP is a concept in which mid-sized and small businesses run two merged solutions at the same time. It is also available to businesses with multiple locations or subsidiaries.This system type is becoming more popular as more businesses seek these systems.

This is related to cloud computing and, in general, makes ERP systems more accessible to all businesses. Businesses today require mobility due to an increase in digital transformation and E-commerce. Because of the increased demand for this technology and convenience, customers must access the companies' offerings via the web.

iii. **Digital transformation -** The integration of digital technology into all business functions to improve daily operations is referred to as digital transformation. This approach can frequently increase revenue and competitiveness while improving employee productivity, customer service, and communication.

iv. **Mobile Application-** Aside from on-the-go data access, the mobile approach in ERP provides a slew of other advantages. One of the most obvious is its ability to conduct business operations at any time and from any location. This means that mobile devices such as tablets and smartphones can access both back-end and front-end activities.

v. **Personalisation -** Historically, ERP platforms with complex scripting languages were difficult to customise to each business's unique needs. However, organisations can now benefit from cloud ERP platforms designed for easier configuration, or what analysts refer to as "low-code" platforms. There is also an increasing number of ERP solutions that are tailored to the needs of specific industries. Companies that want to provide more personalised, relevant experiences to their customers need ERP systems with features like highly customisable dashboards. The growing popularity of AI-based assistive and conversational user interfaces such as chatbots, which can interpret user voice or text input and respond to questions using customer and order information stored within the ERP, is one emerging trend.

vi. **Artificial Intelligence (AI)-** Behind the scenes, artificial intelligence and machine learning capabilities embedded in ERP systems help meet increased demand for personalization and improve a wide range of business processes. While companies could previously add AI capabilities to some ERP systems, more vendors now offer ERP software with these capabilities built in.According to PR Newswire, the global AI market will be worth $641.3 billion by 2028. With voice activation and providing movie/TV show rec-

ommendations based on what you've already watched, AI is making huge strides in everyday technologies such as Alexa, Siri, Spotify, Netflix, Xfinity, and others. If AI can improve our leisure and personal time, it should be simple to integrate with ERP software to automate business processes. It is already thriving in the fields of manufacturing and accounting.

vii. **Predictive Analytics-** The demand for AI-infused ERP reflects organisations' growing desire to mine operational and customer data for new and relevant insights that will boost their top and bottom lines.While analysing ERP data to reveal what happened in the past has always been possible, a focus in 2021 and beyond will be on using predictive analytics to uncover and address what is likely to happen in the future. Machine learning software, for example, can sift through a maintenance company's data on machine repairs to predict when breakdowns are likely. The organisation can optimise maintenance schedules so that parts are serviced or replaced before they cause problems.

viii. **3D Printing/Additive Manufacturing-** 3D printing, also known as additive manufacturing, is now a commonplace. According to MarketsandMarkets, the global 3D printing market will be worth $34.8 billion by 2026. Customers and consumers are rapidly changing their purchasing habits to accommodate what is available, and they are trying new products and services as a result of significant supply chain disruption. With changing conditions, manufacturers are reshoring and near-shoring to locate closer to the customer. Printing on the fly in response to changing customer expectations is made possible by additive manufacturing. Proactive ERP systems will incorporate 3D printing to provide clients with seamless connectivity, business intelligence, and ease-of-use.

Summarised Overview

ERP systems are powered by a centralised database. ERP integrates all of a company's information systems so that all functional areas have access to the same data. The same database is used by sales and marketing, service, finance, human resource management, operations, and inventory planning. ERP typically grants external customers

or suppliers access to the company's information system. As a result, ERP is the software architecture that facilitates the flow of information among an enterprise's various functions. This is accomplished through common database information and enterprise linkages, a powerful Grafic User Interface (GUI), a client-server communication network, a uniform system environment, and so on. ERP software has been available for quite some time. It has, however, undergone so many changes that older versions are now referred to as legacy systems. This change benefited businesses in particular. Furthermore, as trends appear to favour modernisation, it appears that they, along with small and mid-sized businesses, will continue to reap the benefits of ERP software use.

Self-Assessment Questions

1. What is ERP?
2. Explain cloud-based ERP.
3. Explain the design stage in ERP implementation.
4. What is predictive analysis?
5. What are the advantages of using cloud-based ERP?
6. Explain two-tier ERP.

Assignments

1. Explain ERP implementation.
2. What are the steps involved in implementing a successful ERP?
3. Identify the role of ERP in business development.
4. What are the recent trends in ERP?

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

Unit 3

Supply Chain Management

Learning Outcomes

After completing this unit, the learner will be able to:

- assess the Supply Chain Management
- identify the issues and challenges in Supply Chain Management
- evaluate the concept of e-procurement
- explore the trends in Supply Chain Management

Background

The rise of E-commerce, globalization, and increasing customer demands have fueled the emergence of emerging SCM(Supply Chain Management) trends. Traditional, linear supply chains struggle to keep pace with the dynamic nature of today's business land scape. Emerging SCM practices address these challenges by leveraging technologies like Al, blackchain, and big data analystics to optimize processess, enchance visibility, and build resilence throughout the supply chain. Supply chain Managment is essential for any organisation that relies on the movement of goods and services. It ecompasses all activities involved in bringing a product from its raw materials to the end customers, ensuring efficency, cost effectivness, and customer satisfaction. Effective SCM can significantly reduce operational costs, improve product delivery times, and strengthen a company's competitive edge.

Keywords

Supply Chain Management, Planning and Execution, Trends in e-SCM, E-procurement

Discussion

2.3.1 Supply Chain Management (Scm)

- Raw material to finished goods

The management of the flow of goods and services is known as supply chain management, and it encompasses all processes that transform raw materials into finished products. It entails actively streamlining a company's supply-side activities to maximise customer value and gain a competitive advantage in the marketplace.

- Facilitate Trading

Supply chain management (SCM) is the centralised management of the flow of goods and services, and it encompasses all processes that convert raw materials into finished goods. Companies can reduce costs and deliver products to customers faster and more efficiently by managing the supply chain. Good supply chain management keeps businesses out of the news and away from costly recalls and lawsuits. The five most important aspects of SCM are strategy development, raw material sourcing, production, distribution, and returns. A supply chain manager is responsible for controlling and reducing costs as well as avoiding supply shortages.

2.3.1.1 Reasons for adopting Supply Chain Management in business

Imagine you are an entrepreneur. You will get the following benefits when you are implementing supply chain management.

i. **Interconnected Supply Chain-** The main actors in the supply chain landscape are all stakeholders, from the producer, manufacturer, stockist, and supplier to the consumer. They are interconnected and must constantly communicate with one another in order for a product to pass through multiple hands before arriving at its final destination. Supply Chain Management addresses significant issues related to corporate growth, partnerships, global brand expansion, and outsourcing.

ii. **Integrated & Co-operative Logistics -** Supply chain management (SCM) is the lifeline of all critical supplies for all societies' survival. An effective supply chain meets the needs of both producers and consumers and manages in an integrated and holistic manner. When operations in different geographies collaborate and communicate in synergy, supply chains become even more efficient. This makes it easier for logistics to manage every component of an integrated supply chain in supplying inventory backed

by more than one entity.

iii. **Better Supply Chain for Better Business-** Your company's sustainability & business prospects are improved by an improved supply. Both producers and distributors are satisfied when the right product and quantity are delivered on time. Similar to retailers, consumers want to order the products they need and have them delivered right to their doors. Since the customer is king, having a strong supply chain management directly enhances customer service. In the end, this promotes stronger corporate expansion.

iv. **Seamless Movement-**Lack of risk management expertise is a major factor in why many firms are unable to handle possible issues in their day-to-day operations. Supply chain management enables the smooth movement of anything, including products and any unforeseen natural calamity. Supply chain managers oversee the logistics for any organisation on a global scale. They can quickly identify issues or disruptions for flawless transportation of commodities with competent supply chain management.

v. **Reduced overall operating costs-** You may increase your return on investment by not just making the proper investments in your company, but also by avoiding unnecessary spending wherever you can. In other words, by making significant improvements to your supply chain, you can lower your entire operating costs. By accelerating the delivery of the appropriate quantity of inventory at the appropriate time to your warehouse, you will be able to save purchasing costs and avoid high inventory charges. More specifically, for manufacturing, supply chain optimization makes ensuring that suppliers deliver essential parts to the assembly line when needed. Lack of materials can impede manufacturing and waste valuable financial resources; this helps prevent that. As a result, a smooth supply chain reduces delays, which is essential for preserving financial effectiveness and efficiency.

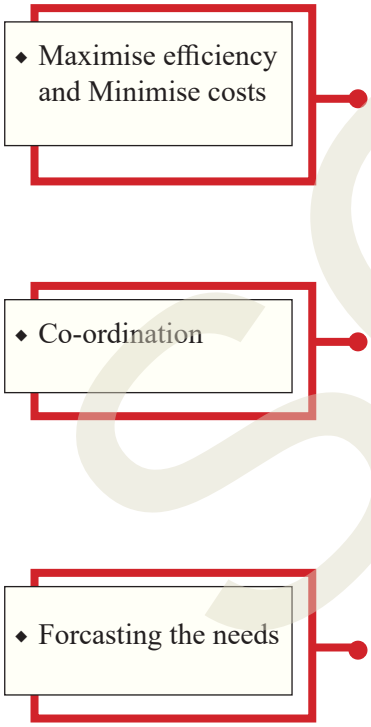
vi. **Vitalized quality of life within the warehouse-** Regardless of your position in the supply chain as a manufacturer, retailer, warehouse manager, or supplier, having a positive workplace culture and quality of life is essential. Your supply chain will be improved by implementing automation and incorporating the best practises in your sector. This will reduce the chance of error in the warehouse

and elsewhere by greatly reducing the handling, storing, and picking times for all commodities. By doing so, it will greatly boost your company's bottom line and significantly improve the general quality of life of the warehouse staff.

vii. **Identifying potential problems.-** The buyer may complain of poor service if they order more stuff than the manufacturer can provide. Manufacturers could be able to foresee the shortfall through data analysis before the customer is dissatisfied.

viii. **Optimizing price dynamically.-** Products that are in season have a short shelf life. These goods are often discarded or sold at steep discounts towards the end of the season. Prices are frequently dynamically adjusted to suit the demand for perishable "products" by airlines, hotels, and other businesses. Similar forecasting methods can increase margins even for hard items by applying analytical software.

2.3.1.2 Components of Supply Chain Management



The supply chain manager strives to keep costs low while minimising shortages. The job entails more than just logistics and inventory purchases. Supply chain managers are in charge of overseeing and managing an organization's overall supply chain and logistic operations to maximise efficiency and reduce costs.

Productivity and efficiency improvements can have a direct impact on a company's bottom line. Good supply chain management keeps businesses out of the news and away from costly recalls and lawsuits. The supply chain manager in SCM coordinates the logistics of all aspects of the supply chain, which consists of the five components listed below.

i. **Planning-** SCM typically begins with planning to match supply with customer and manufacturing demands to achieve the best results. Firms must forecast their future needs and act accordingly. This relates to the raw materials required at each stage of manufacturing, the capacity and limitations of equipment, and the staffing requirements throughout the SCM process. Large organisations frequently rely on ERP system modules to aggregate data and compile plans.

ii. **Sourcing-** Efficient SCM processes rely heavily on strong supplier relationships. Working with vendors to supply raw materials required throughout the manufacturing pro-

- Supply of Raw Materials

cess is what sourcing entails. A company may be able to plan ahead of time and collaborate with a supplier to source goods. Different industries, however, will have different sourcing requirements. SCM sourcing in general entails ensuring:

- The raw materials meet the manufacturing specifications required for product production.
- The prices paid for the goods are reasonable in comparison to market expectations.
- Due to unforeseen events, the vendor has the ability to deliver emergency materials.
- The vendor has a track record of delivering high-quality goods on time.
- Supply chain management is especially important when working with perishable goods. When sourcing goods, businesses should consider lead time and how well a supplier can meet those requirements.

iii. **Manufacturing-** At the heart of the supply chain management process, the company transforms raw materials into something new by utilising machinery, labour, or other external forces. Although it is not the final stage of supply chain management, this final product is the ultimate goal of the manufacturing process.Assembly, testing, inspection, and packaging are examples of subtasks in the manufacturing process. A company must be mindful of waste and other controllable factors that may cause deviations from original plans during the manufacturing process. For example, if a company uses more raw materials than planned and sourced for due to a lack of employee training, the company must either correct the problem or go back to the earlier stages of SCM.

- Careful consideration

iv. **Delivering-** A company must get its products into the hands of its customers once they have been manufactured and sales have been completed. Because the customer has not yet interacted with the product, the distribution process is frequently viewed as a contributor to brand image. A company with strong SCM processes has robust logistic capabilities and delivery channels to ensure timely, safe, and low-cost product delivery. This includes having a backup or diverse distribution methods in case

- Supply of product

one mode of transportation becomes temporarily unavailable.

v. **Returning -** The supply chain management procedure concludes with product support and customer returns. Even worse is when a customer has to return a product due to an error on the part of the company. The company must ensure that it has the ability to collect returned goods and properly assign refunds for received returns. This procedure is often referred to as reverse logistics. Whether a company is conducting a product recall or a customer is simply dissatisfied with the goods, the business transaction with the client must be resolved.

- Reverse logistics

2.3.1.3 Types of Supply Chain Models

Supply chain management is not the same for every company. Each company's SCM process is shaped by its own set of goals, constraints, and strengths. In general, a company can use one of six different primary models to guide its supply chain management processes.

i. **Continuous Flow Model-** The continuous flow model is centred on efficiency. It provides stability in high-traffic environments. This traditional model is best suited for manufacturers who produce the same product on a regular basis with little design variation or change. This model is ideal for commodity manufacturing. Its high level of efficiency is reflected in low product prices. For manufacturers, margins are based on raw material prices.

- Commodity Manufacturing

ii. **Agile model-** The agile model is ideal for specialty item manufacturers. This model has been fine-tuned for small batch of product. This necessitates less automation and more knowledge. This added value allows businesses that use this model to charge higher prices. This model is ideal for businesses with erratic demand or products that are ordered by customers. It emphasises flexibility because a company may have a specific need at any time and must be prepared to pivot accordingly.

- Product with erratic demand

iii. **Fast Model-** The fast chain model is designed to be responsive. It's ideal for manufacturers who frequently change their product line. This model is ideal for trendy products with short life cycles. In this case, the manufacturer who can flood the market before the trend cycle ends is the winner.This model emphasises a product's quick turnover and short life cycle. A company uses a fast chain model to cap-

- Trendy products

italise on a trend, quickly produce goods, and ensure the product is fully sold before the trend ends.

iv. **Flexible model-** The flexible model works best for businesses that are affected by seasonality. During peak season, some businesses may have much higher demand requirements, while others may have low volume requirements. A flexible supply chain management model ensures that production can be easily ramped up or wound down. During peak season, it can respond to high volume demands. Flexible model businesses, on the other hand, can manage and absorb periods of low or no demand. This model is similar to a light switch: turn it on and off as needed. To implement the flexible supply chain model, a company must have the right tool (or automated machinery) for the job. This model also necessitates a large supplier network or personnel with extensive knowledge.

- Seasonal goods

v. **Efficient model-** Companies competing in industries with extremely low profit margins may seek to gain an advantage by optimising their supply chain management process. This includes making the best use of equipment and machinery, as well as managing inventory and processing orders as efficiently as possible.The efficient chain model is designed for industries that are highly competitive and where end-to-end efficiency is the ultimate goal. In order to properly burden and sweat machinery assets, this model heavily relies on production forecasting. The efficient model is also heavily influenced by commodity and raw material prices. Capacity issues plague efficient chains in the post-pandemic world. Labour shortages, material shortages, and delays are all factors.

- Production Forcasting

vi. **Custom model-** If none of the above models meets a company's requirements, it can always turn to a custom model. This is frequently the case in highly specialised industries with high technical requirements, such as a car manufacturer.Custom setups during production and assembly are the focus of the custom-configuration model. Typically, this setup time occurs at the start of a longer production and assembly run process.

- Product with longer production prrocess

2.3.2 Supply Chain Challenges

To meet new demands and supply chain challenges, the modern supply chain must evolve, and supply chain managers must plan ahead of time to keep everything running smooth-

- Need for new SCM

- Due to lack of accountability

ly. Consumer expectations, more routes to market, international complexities, and other factors all contribute to significant challenges across the supply chain network. The following are the major supply chain challenges:

i. **Increased costs throughout the supply chain-** Profit margins are being squeezed as costs rise throughout the supply chain network. These costs come from a variety of sources, and a lack of visibility and accountability for reducing them can lead to increased operational costs. Among the major cost-increasing factors are:

- Fuel prices are rising for goods transported by road, sea, or air.
- Commodity price increases drive up the cost of raw materials.
- Supplier and manufacturer labour costs are rising.
- Complex international logistics results in higher charges for product storage, transfer, and management.

- Problem due to multiple channel for distribution

ii. **Supply chain complexity due to multiple channels to market-** Consumers purchase products through multiple channels, and as the number of routes to market expands, the underlying supply chain must adapt. To address each of the channels, supply chain managers must develop variations on supply chain processes:

- E-commerce websites that sell directly to customers necessitate quick last-mile delivery and local logistics.
- To ensure product availability, traditional retailers and wholesalers require large storage facilities near major metropolitan areas, as well as accurate inventory control.
- Third-party marketplaces such as Amazon necessitate a thorough understanding of fulfilment options as well as strict adherence to their terms and conditions.
- Drop shipping retail necessitates quick international services so that customers can receive their purchases as soon as possible.
- Supply chain managers must manage multiple supply chains, third parties, and other organisations to ensure a positive end-user experience, regardless of how products are ordered and delivered.

- Quality and speed

iii. **Consumer demands drive need for improved speed, quality and service-** Consumers have never had more options, and every industry is under threat of disruption. Every interaction with a customer should be centred on providing excellent products and services. When it comes to purchasing goods, quality and speed are becoming just as important as price:

- Consumers expect retail goods to be available immediately and online goods to be available within a few days.
- Consumers expect products to meet certain quality standards.
- In all countries where they are available, raw materials, goods, and finished products must meet safety and other compliance regulations mandated by law.
- Environmental sourcing of goods is becoming increasingly important to ethically conscious consumers.
- The most successful products are those that meet the needs of consumers in terms of quality, availability, and price. Meeting those needs is dependent on the underlying supply chain.

- External environment

iv. **Risk in the supply chain creates pressure-** The supply chain is put under strain by international complexity, environmental changes, economic pressures, and trade disputes. This stress can easily turn into risks and issues that spread throughout the network, causing major issues:

- Suppliers, manufacturers, logistics, clients, and customers are dispersed across multiple countries, time zones, and continents, necessitating careful planning and management.
- Adding steps to the supply chain increases the complexity for both upstream and downstream partners.
- Data silos and a lack of visibility make reporting, business intelligence, and good decision-making more difficult.
- Compliance, regulations, and quality management necessitate strong agreements, contracts, and controls with supply chain organisations.
- To prioritise and eliminate risks and manage issues that arise, supply chain managers must develop contingency

plans and mitigating action plans.

v. **The impact of supply chain volatility**- Volatility and complexity don't just cause problems at one point in the supply chain; their effects can reverberate throughout the entire infrastructure. Supply chain managers must address these issues as soon as possible before they cause delays, backlogs, bottlenecks, and other problems. Tariffs are being imposed across trade routes as a result of political circumstances and protectionism, resulting in additional fees, delays, and increased customs processing time. This means that international shipping will be slower and competitors in different countries will be able to take advantage of lower tariffs. Port congestion is increasing as the volume of goods imported from other countries increases. This adds to the pressure because ships, trucks, and trains must wait to load, unload, and transfer products. These issues are exacerbated by the fact that port authorities and operators charge organisations to store goods at their facilities.

- Political Circumstences and Tax rate

2.3.3 E-Scm

The flow of materials and information through a business, from the initial purchasing function through the operation and eventually to the customers, is known as the supply chain. The concept of SCM is a holistic view of coordinating functions that transfer data and material resources from the suppliers to customers in the finished form to make the process efficient and cost effective. The importance of E-commerce to manufacturing and distribution is undoubtedly a part of SCM. If high speed, low cost, communication and collaboration with customers and suppliers are critical success factors for effective SCM, then the e-chain is the future.

- Holistic Approach

The very essence of SCM is its effective collaboration throughout a network of customers and suppliers. The potentials in productivity, cost reduction and customer service are enormous. Of course, the benefits are based on effectively employing E-commerce, which makes information quality an even higher priority than before. Providing the right amount of relevant information to those who need to know it when they need to know it is in fact an effective supply chain management from an information point of view.

- Quality of service

Good supply chain practitioners know that information should be passed on only to those who need to know it, and in the form in which they receive the information. For example, demand information, inventory positions, order-fulfilment,

- Speedy Exchange of Information

supply management and a whole host of other information exchange activities will change how we sell products, supply products, and make and receive payments for goods and service. The e-supply chain will have customers and suppliers seamlessly linked together, throughout the world, exchanging information almost instantly. The velocity of relevant information flow will be so fast that responding to the inevitable changes in expected vs actual customer demand will allow faster changes in the material flow

- Information at low cost

Fast access to relevant supply chain information can payoff handsomely at a lower cost, less inventory, higher quality decision-making, shorter cycle times and better customer service. One of the biggest cost savings is in the overheads associated with lots of paperwork and its inherent redundancies. The non-value-added time of manual transaction processing could instead be focused on higher revenue creation activities without proportional increases in expense. For example, a customer's purchase order instantly becomes the supplier's sales order, which then results in packing, shipping and subsequently, an invoice.

2.3.3.1 E-business technology Assisting the problems of Supply Chain Management(SCM)

Table 2.3.1

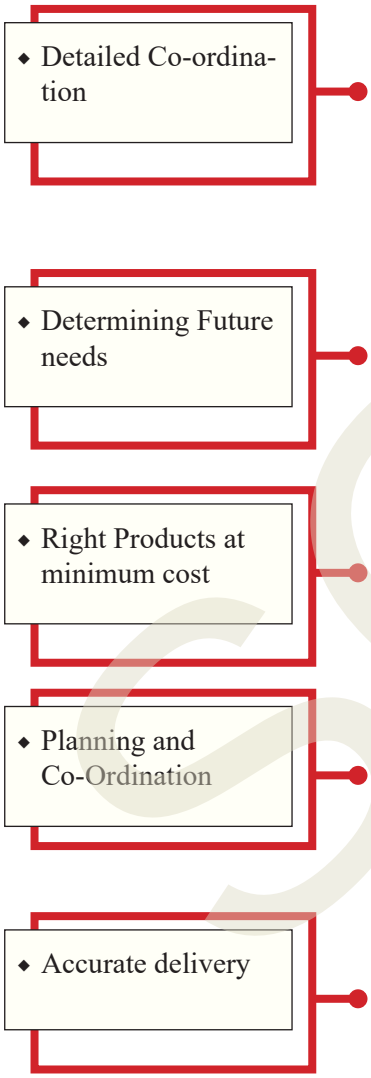
E-business technology is assisting with Supply Chain Management issues

Problems of Supply Chain Management	How E-business technology can reduce problems in SCM
Pressure to reduce manufacturing costs and distrust of products to remain competitive.	Paperwork is reduced through the electronic transmission of order invoices and delivery notes. Reduce the amount of inventory required by better understanding demand. Reduced information and component supply time throughout the supply chain. Reduce SCM system purchase and management costs by utilising an online service (SaaS)
Demand Forecasting	Customer demand sharing with suppliers as part of Efficient Consumer Reports (ECR)
Failure to consistently deliver products on time or a lack of items on store shelves	Supplier becomes responsible for items availability through vendor-managed inventory

Failure to deliver or ship the correct product	Human error is reduced. 'Checks and balances can be built into systems'
High inventory costs	Inventory was reduced throughout the supply chain as a result of better demand forecasting and faster inventory replenishment.
Time for new product development	Improved availability of information about potential suppliers and components.

2.3.3.2 e-Supply Chain Components

The components of the e-supply chain are as follows:

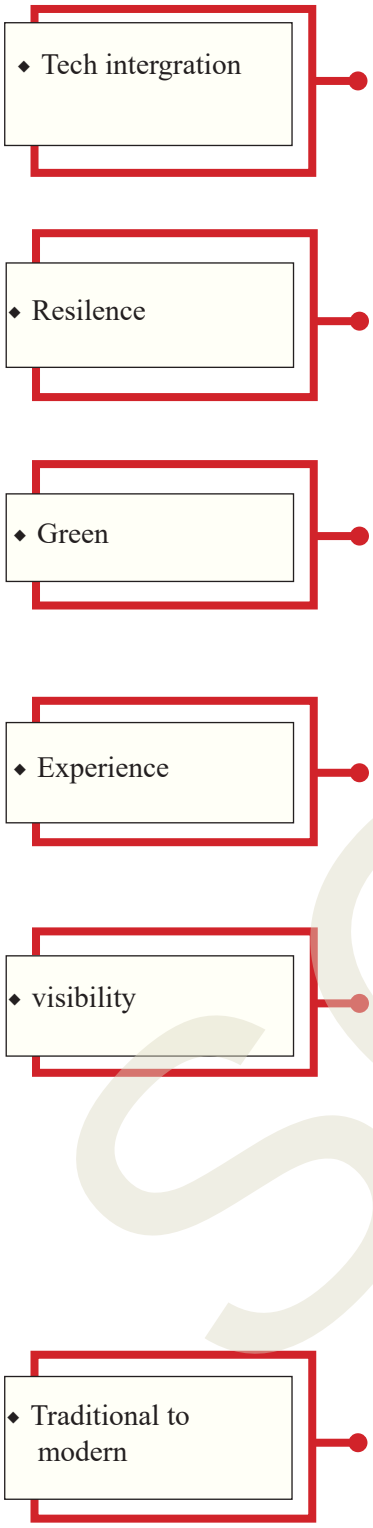


- **Advanced Scheduling and Manufactured Planning Programme-**This automated programme provides detailed coordination of all manufacturing and supply efforts based on individual customer orders. Scheduled is based on real-time analysis of changing constraints throughout the process, from equipment malfunctioning to supply interruptions. Scheduling creates job schedules for managing the manufacturing process as well as logistics.
- **Demand Forecasting Programme-** This module supports a range of statistical tools and business forecasting techniques. It constantly takes into account changing market scenarios and economic factors while making decisions.
- **Transportation Logistics Programme-** This programme facilities resource allocation and execution to ensure that materials and finished goods are delivered at the right time and at the right place, according to the planning scheduling, at minimal cost. It considers variables like transportation mode and availability of each mode, such as airlines, trains, and trucks.
- **Distribution Planning Programme-** This is integrated with demand forecasting, manufacturing schedules, and transportation logistics to reach the customer.
- **Order Commitment-** Order commitment is linked to all the other modules so that accurate delivery of goods and services can be guaranteed

2.3.4 Trends In Supply Chain Management

The landscape of supply chain Management is constantly evolving, driven by technological advancement and the ev-

er-changing needs of business and consumes. Here are some of the major trends shaping the future of SCM:



i. Technological intergration: Technologies like ArtificialIntellegence (AI), Machine Learning and block chain are being increasingly intergrated into SCM processess. AI automate repetitive tasks, optimizes logistics and predicts potential disurptions, while block chain enhances transparancy and traceability across the supply chain.

ii. Focus on Resilence: Building resilence supply chain is crucial in today's unpredictable world. This involves diversifying suppliers, implementing near sharing or on-sharing strategies, and utilizing real-time data to proactively manage disurptions.

iii. Sustainability: Sustainability is becoming a core pinciple in SCM,with business focusing on reducing their environmental impact. This inculdes implementing sustainable practces throughout the supply chain, Such as using ECO friendly packages and optimising transportation routes.

iv. Customer centercity : Today's customer expect fast, efficient, personalised delivery experiences.SCM is adapting to this by incorporating omni channel fullfillment Strategies, offering flexible delivery options and providing real-time order tracking

v. Collaboration and visibility: Colaboration and information sharing among all stakeholders in the supply chain are essential for smooth operations and efficent problem-solving. Cloud based platforms and data analystics tools are facilitating greater visibility and collaboration across the entire supply chain network.

2.3.5 Information and Technology Applications for Scm

The internet has changed the way businesses compete, and managers now need to know what makes it unique to create models that work and take advantage of the opportunities it offers. The rules governing the internet economy differ from those governing the traditional economy, and managers of both internet-based and traditional brick-and-mortar businesses have had to decide whether to adapt their business models or create new ones based on the essential characteristics of the Internet.

Many technological-based innovations, such as Just-in-

- Innovations

Time, Quick Response, Efficient Consumer Response, and Continuous Replenishment are well suited to improving supply chain management. All rely heavily on the information made available by the most recent technological advances. Both hardware and software must be addressed in the development and maintenance of supply chain information systems. Computers, input/output devices, and storage media are examples of hardware. All system and application programmes used for transaction processing, management control, decision-making, and strategic planning are considered software.

Below are a few examples of software titles that address some aspect of supply chain management.

- Constraint-based planning tool

Supply Chain Planning, a new software programme developed by Ross Systems, Inc., is an integrated suite of constraint-based planning tools that provide demand, replenishment, and manufacturing tools for accurate planning and scheduling of those activities. This software offers a complete enterprise resource planning solution that incorporates the most advanced supply chain planning capabilities available.

- For bidding

A technology collaboration between Procter & Gamble Distributing Co. and Sabre Decision Technologies resulted in the Transportation Network Optimization software system, which allows shippers to bid while also streamlining the bidding and award process.

- Synchronising customer demand and supply constraints

Logistility Planning Solutions was recently introduced as a programme capable of managing the entire supply chain from demand to supply by synchronising customer demand and supply constraints via Internet-enabled communications about forecasts, inventory, and replenishments for all chain members.

Several technologies have recently gained popularity due to their ability to improve the flow of information throughout the supply chain. Electronic commerce, electronic data interchange, bar coding and scanning, data warehouses, the Internet, intranet/extranet, the World Wide Web, and decision support systems are relatively new phenomena in supply chain management applications.

2.3.6 Transformation To Web-Based Technology

The Internet has brought new opportunities for the Supply Chain field. Companies have to adapt their Supply Chain to the Internet and connect through Web technologies with their business partners to create Supply Chain networks. The combination of SCM (Supply Chain Management) concepts and the Internet tools resulted in a Web-based application called e-SCM.

- Combinations of Internet and SCM

The e-SCM model uses Supply Chain competencies and resources and exploits them more efficiently into an extended virtual organization. E-SCM applications support companies to win competitive advantage because they create more value for the customer and have the goal to satisfy the client's requirements in the best possible way and in real-time

- Gratification

E-SCM applications allow the creation of extra value for the customer and have the goal of satisfying the client's requirements in the best possible way and in real-time. Migration to a web-based approach for SCM applications is required for streamlining Supply Chain activities, maintaining a consistent quality of service, and controlled distribution of the data which otherwise cannot be achieved.

According to Ross (2003), SCM represents much more than these. To figure out its entire extent, we should approach it from three perspectives:

- Cost reduction

i. **Tactical:** SCM is an operations management technique that seeks to integrate and optimize the capabilities of internal business functions and to direct them to new opportunities for cost reduction and increased channel throughout by working with the matching functions from the Supply Chain partners, customers, and suppliers. Tactical SCM can be divided into four activities: supplier management and inventory optimization, product and service processing, customer management and customer order management, channel support activities to facilitate financial transactions, marketing information flows, electronic information transfer, integrated logistics

- Inventions

ii. **Strategic:** SCM transforms the linear, sequential SC into a networked SC focused on functional and strategic interoperability through collaborative partnerships for the correlation of SC processes. The SC process correlation creates unique sources of value by unifying resources, competencies, and capacities of the entire network according to Ross (2003).These tactical and strategic approaches are focused on the evolution of business networks, resulting in innovations, new processes and technologies, increased reliability and speed, and mass customization economies.

iii. **Web technologies:** e-SCM enables the integration and synchronization of all SC information and processes. Web-based applications allow the reduction of transactional costs by 80% compared to private network costs.

- Cost Effective

E-commerce standards (e.g. XML, Java) enable low-cost integration of customer, supplier, product information, and competencies from SC partners, the transmission of documents and data in real-time at every level in the Supply Chain. E-SCM generates more value for customers through the agile, flexible, collaborative intelligent systems built on dynamic networks of Web-enabled partners.

- Value Added Services

To implement an E-commerce system, the concept of value is important from the customer's point of view because the client generates company revenue. The value to the customer has to be considered at the moment of the creation of the E-commerce system management strategies. First, the products have to meet customers' requirements, to be available and to be accessible for them on the company sites. Customers are attracted by the product's low price and high quality and value-added services.

- Realtime Information sharing

The Internet enables the connection of Supply Chain partners through Web technologies and allows SCM networks to achieve new capabilities: real-time information sharing for collaborative planning, forecasting and replenishment, visibility and management of SC events in real-time, SC integration, and collaborative relationships on all levels of the network.

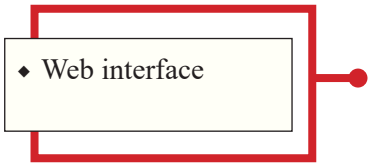
- Agility and Flexibility

Collaboration allows inventory optimization, provides more value for the customer, and satisfies their needs. Synchronization of processes and information from all network nodes to quickly respond to customer needs. This is possible if customer event-driven data are available in real-time across the supply network, allowing concurrent decision making while the decision is transmitted in the SC system. Synchronization can provide agility and flexibility which allow to respond to changes in customer demand and supply dynamics.

- End-to end intergration

- **Fulfilment of Desire**- E-SCM applications have to centralize and manipulate data from the ERP systems of SC partners through Web technologies. They include tools for end-to-end integration of business processes. The Web front end should be linked to the back-end order processing, manufacture, procurement, accounting, and distribution modules included in the ERP system. Integration tools allow data access and manipulation of shared information for each Supply Chain node. These are standards for document transmission, access to data sources through standard database interface (e.g. ODBC), support for standard data formats (XML), application adapters to hook E-commerce packages into back-end systems, specialized business pro-

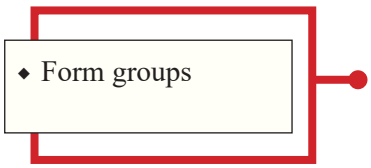
cess workflow engines, business intelligence tool capable of supporting, extracting and validating data in and out of a multiple, heterogeneous system, integration, and collaboration application services



- **Collaboration of Business activities-** The most used method for linking back-end applications and systems for E-commerce is to provide an appropriate Web interface. There are several options for this purpose: porting of Web servers on proprietary platforms, developing middle-tier functionality to map between browser and back-end protocols, and interfacing E-commerce applications that have standard browser interfaces with back-end

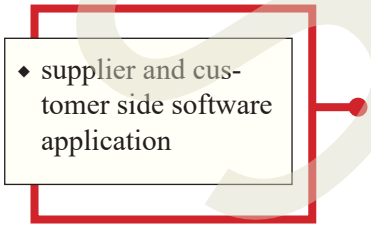
Usually, the e-SCM business system can be divided into three components:

i. **ERP** (Enterprise Resource Planning) system is the center of the present business solution. It has been connected with Web-based applications to form groups of business software functions: production, purchasing, CRM, and SCM. These applications have to be interconnected to provide complete reports on customers, demand, suppliers, supply, finance, manufacturing, delivery, etc.



ii. **Middleware** consists of e-SCM applications enabled by communication standards such as EDI and XML. Internet-based standards like XML allow quick generation of transaction documents

iii. **Web-based applications** are directly integrated with the ERP backbone through EAI (Enterprise Application Integration). These applications comprise a variety of supplier and customer-side software applications: CRM (Customer Relationship Management) for customer management, CPC (Collaborative Product Commerce) for collaboration of manufacturing and product designers for new product development, SCM (Supply Chain Management), e-Procurement applications include exchanges to facilitate acquisition, e-Finance, and Human Resources application. E-SCM portals extract data from ERP systems for trading partners in the Supply Chain, reducing at the same time the cost of distributing and sharing content and applications.



- **Elements of e-SCM Business System-** The e-SCM model needs the ERP systems of the partner companies and E-business applications to be integrated to create infor-

- Information flows

mation flows between Supply Chain nodes. Companies have to synchronize data about customers, processes, and products internally and externally. This connection needs appropriate hardware platforms and software: integration standards for document formats to enable information transfer, Internet transmission protocols as well as open data formats to facilitate data transfer between companies, standard transformation, and routing tools to convert and route data in different formats, tools for creation and management of distributed business processes and document exchange, security for data transfer.

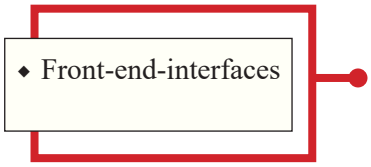
- **e-SCM acts as a Supporting System-** Business process logic has to be separated from applications to create the collaboration needed. EAI (Enterprise Application Integration) allows the integration of company applications using a set of technologies and services that form a middleware. Technologies available for EAI are used at different levels: data level – ODBC, Java Database Connectivity, application level-CORBA, JavaBeans (EJB), Component Object Model (COM/DCOM), and business process levels – Web Service Business Processes Execution Language (WS-BPEL). There are specialized SC integration technologies such as ebXML and RossetaNet developed based on generic integration technologies. The above technologies provide physical integration. The logical integration includes agreements on concepts and model integration. The Supply Chain middleware should provide access to data from different companies and transaction processing. When a transaction takes place, the data passes through the middleware layer, is translated into a language like XML or Java, and is sent in a readable format to another application layer.

- Middle ware

- **Integration Technologies-** The process-oriented layer is called Business Process Management (BPM) and it integrates processes across business units, applications, and enterprises to align business processes and deliver key information. BPM provides visibility to business processes residing on different computers and architectures to support the monitoring and synchronization of business processes and events management across networked Supply Chains.

- Visibility

- **Overall control of the System-** SCM portals are considered the most used applications for collaboration in the Supply Chain. Portals are front-end interfaces to enterprise information systems. Enterprises develop their portals to



provide access to company applications and Internet and intranet-based content. At the same time, they can develop portals for their customers and attract them with customized services, provide intelligent information search, and automatic alerting for customers using settled rules or software agents. Portals link to internal applications to retrieve data from internal data sources (ERP data), data from the Web, or other vertical portals. The data should be displayed in a manner that enables decision making in a short time. The same portal can be used for different departments and business partners with controlled access and customized options. A portal for Supply Chain Management can provide access to company inventory differently for suppliers, customers and employees. The development of wireless technologies, allows enterprises to extend their portal services to their mobile users. SCM partners will be able to access the e-SCM applications through their mobile appliances: smartphones, PDAs, laptops, etc.

- **Access to Everyone-** The design and implementation of an eSCM application need to connect heterogeneous environments and automate processes and data flow so that it can react promptly to demand changes. To achieve all these, numerous development tools are needed such as programming languages, hardware and software infrastructure, IT management services, business integration for all the supply chain partners, standardization and connection of business processes for the entire chain. At the same time, transactional data from different applications and ERP systems have to be integrated, processed and sent in a standard format such as XML to the partner that needs that information. Once the data about demand, customers, orders, production, inventory, resources, supply, delivery, forecasting are available in real time to the right node in the supply chain, the managers have to make the right decisions about every strategic activity of the network and its members. This can be accomplished only by using decision support tools that use statistics and business intelligence to discover patterns in customer behaviour and market conditions and foresee the future changes and trends. In this way, companies can meet customer requirements before their competitors and gain a competitive advantage

2.3.7 E-procurement

- Purchasing through Online

The process of requisitioning, ordering, and purchasing goods and services online is known as electronic procurement, also known as e-procurement or supplier exchange. It is a business-to-business transaction. Unlike E-commerce, e-procurement is a closed system that is only accessible to registered users. Through bids, purchase orders, and invoices, e-procurement facilitates interactions between preferred suppliers and customers.

- Business to Business

When an organisation uses the internet (or sometimes an intranet) to procure the goods and services it requires to operate, this is referred to as e-procurement. Paper-based processes are phased out in favour of an entirely electronic workflow that streamlines all aspects of the purchasing process.

- Services at low cost

The purpose of using an e-procurement system is to purchase goods or services as cheaply and quickly as possible. Businesses must build relationships with their suppliers to accomplish this goal. Procurement personnel can then negotiate contracts with suppliers. They can also set budget and spending guidelines or limits within the e-procurement platform.

- Connect Supplier and Customer

Following the development of Electronic Data Interchange in the 1980s, e-procurement began (EDI). A decade later, advancements in EDI enabled organisations to create online vendor catalogues. E-procurement today encompasses everything from supplier evaluation and selection to contract management, electronic orders, and payments. E-procurement makes use of a web interface or other networked system to connect suppliers and customers. A chief procurement officer or procurement department usually establishes the policies governing the organization's e-procurement of materials.

2.3.7.1 Steps of e-procurement

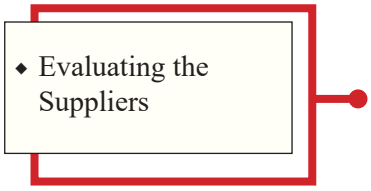
E-procurement eliminates the need for paper-based processes, and with its automated capabilities, it drastically reduces manual processes and the errors that accompany them—even eliminating them in some cases. The following are the steps involved in e-procurement.

- e-Informing

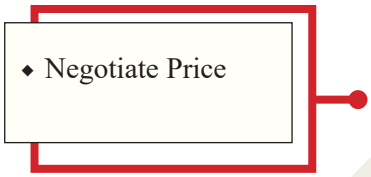
i. **Online information transferring-** The stage that corresponds to a traditional procurement cycle is online information transfer, also known as e-informing. It describes the information exchange between two parties. This exchange frequently occurs between internal company units and relevant external suppliers. This initial step allows a business to optimise and streamline its e-procurement process.

ii. Online sourcing- Online sourcing, also known as e-sourcing, is the procurement phase in which the company pre-qualifies all of its potential suppliers. They make this decision based on the specified procurement requirements, which allows them to shortlist those suppliers for the evaluation stage. This second stage coincides with the company's executive and procurement figures defining business requirements.

iii. Online tendering- Online tendering, also known as e-tendering, refers to the process by which a company requests information, quotes, and proposals from its shortlisted suppliers. This phase assists the business in analysing and more thoroughly evaluating the prospective suppliers. It also coincides with the evaluation and solicitation process. The business may put strategies in place during this third stage to guarantee the openness of their assessment.



iv. Online auctioning- Online auctioning, also known as e-auctioning, is the stage at which all parties involved set the contract terms and negotiate prices. Following agreement between the parties, the buying company buys the supplies from the supplier. Multiple companies may compete for a contract with a supplier, often by paying more. E-reverse auction is a substitute for this requirement, whereby several suppliers compete by lowering their prices in an effort to win a contract with a single buyer.



v. Online product ordering- Online product ordering, also known as e-ordering, is the final step in the e-procurement process, which also includes the creation and approval of requisitions. This is when the company places orders and then receives them by the deadline. The business completes the process by indexing the contracts in a digital catalogue so that employees can access them later and place a new order.

2.3.7.2 Benefits of e-procurement

E-procurement offers significant benefits for your organization and the most common are listed below:

- **Transparency of information-** E-procurement makes the transfer of information and data more transparent to the company and its suppliers. This data can be used to monitor spending patterns, increase purchasing power, rein in non-compliant spending, and opportunities to combine suppliers.

- **Save money-** E-procurement can help businesses save money by eliminating costly errors that can occur when dealing with manual orders and paperwork. The money saved can then be used for other initiatives such as marketing and advertising.

- **Procurement process automation-** By automating procurement processes, entrepreneurs can maintain more consistent and cost-effective operations. There is a wide range of procurement software available to help you achieve this goal, reducing the need for repetitive tasks such as data entry and analytics.

- **Shortens procurement and purchasing cycles-** The advantage of shorter process cycles is that you can obtain the goods and services you require much more quickly. This helps to reduce downtime in operations, which ultimately helps to increase productivity, save money, and increase profits.

- **Improves inventory management and control -** A company's inventory management is important because it allows them to gather accurate information about their current supply of goods. They can then use this data to make better business decisions.

- **Streamlines operations -** This is an important advantage of using e-procurement because it saves time and increases productivity. A more uniform system is created and problems are easier to spot and fix before they get worse when all online buying and selling processes run smoothly.

- **Larger product and service selection-** Because all transaction and procurement processes take place online, there is a wider range of products and services to choose from. This variety makes it possible to compare the options and choose the products that are most suitable for business while remaining within your budget.

2.3.7.3 Participants in different types of e-procurement

Eight types of intermediaries need to be reviewed to understand options for changes to procurement as part of developing an e-procurement strategy;

i. *Traditional manufacturers* which produce physical goods that are generally sold to other corporate customers.
ii. *Direct sales manufacturers*, similar to traditional manufacturers except that they bypass intermediaries and sell directly to end users via web or phone channels. These can

include service companies. Direct sales manufacturers can be a cost-effective option for companies procuring business services such as flight booking for staff.

iii. *Value-Added procurement partners* act as intermediaries to sell products and services to other business.

iv. *Online hubs* are industry-specific vertical portals such as Elemica (www.elemica.com) that generate revenues via B2B exchanges.

v. *Knowledge experts* who produce information goods, for example, e-consultancy.com and Hitwise.com have subscription services with innovation alerts, best practice, and statistics of internet usage.

vi. *Online information service* provides unique information to end users that is either original in its development or provides a unique editorial perspective.

vii. *Online retailers* include start-up E-businesses and more traditional multi-channel retailer. Eorooffice.com (www.eurooffice.co.uk) is an internet pure play providing office goods at lower prices than traditional providers. Traditional providers in this space with a network of stores include staples (www.staples.com)

viii. *Portal communities* seek to aggregate different online information services into an integrated customer experience.

There are several tools and application which fall under e-procurement some of them are:

- EDI
- Seperate Module
- Tool for electronic sourcing

- Procurement messages are exchanged between computers from two different organisations in an electronic data interchange system. Messages are sent in batches and can be easily transmitted and saved. Order transmission, order confirmation, logistic information, and order invoicing are the most common uses for EDI.
- The procurement function is handled by a separate module in an enterprise resource planning system.
- Internet-based tools and resources aid in the procurement process. Email, internet-based EDI, XML-based data exchange over the internet, and other common applications The Internet provides tools for electronic sourcing, e-tendering, e-auctioning, e-ordering, and e-catalogues.
- During the selection phase, an e-sourcing tool is used to identify potential suppliers. E-tendering tools are used to distribute tenders that include procurement requirements,

- Upward and downward price mechanism

supply schedules, contracting terms, and so on. E-auctioning tools bring together potential suppliers identified during the selection phase under one umbrella to conduct auctions. E-auction tools use two distinct mechanisms: an upward price mechanism for the selling organisation and a downward price mechanism for the buying organisation. E-ordering tools are used to purchase office supplies and services; they are available to all employees within the organisation and are primarily used for ad hoc purchases. A web-based ERP tool is used for product purchases, is only used by the procurement department, and is part of a planned process.A traditional procurement process starts with phase requirement definition, sourcing, solicitation, evaluation, contracting and contract management. In the internet based these steps are replaced by e-sourcing, e-tendering, e-reverse auction, e-ordering and web-based ERP.

2.3.7.5 Benefits of e-procurement for the Buyer and Supplier

- Subsets of e-procurement

The benefits or drivers of e-procurement focus on different aspects and could be divided into four subsets: cost, strategic, internal, and supplier relationship. Cost refers to a cost focus, where cost reduction is the main topic. Strategic, benefits related to managerial issues are considered, such as strategic decision making. The internal focus refers to the internal organization and processes, while the supplier relationship concerns improvement in supplier management.

Table 2.3.2 Benefits of E-procurement among buyers and suppliers

Benefit	Buyer	Supplier
Cost reduction	Reduced maverick buying could result in negotiated unit cost reductions. Suppliers administrating their own products electronically reduce administrative work. Less manual activities and less time to perform activities will be required.	Reduced complexity and administrative burden
Strategic focus	Improved follow-up and management.	Improved follow-up and management.

Internal focus	Efficient processes through reduced lead-times and better resource usage. Iproved visibility.	If the purchasing process is visible, it is also easier for the supplier to understand the process. The steps should be communicated externally
Supplier relationship	Clearer instructions and an automated check-list could also prevent errors in tenders, and thus prevent appeals.	One person responsible for tendering and through the whole lifespan of a contract, which could develop trust and co-operation in the relationship. Suppliers administrating their own products electronically. Access to purchasing-management information.

Summarised Overview

Over the last two decades, supply chain management has shifted from an emphasis on integrating logistics and lowering costs to providing better products and services that provide value to end users. The challenge that currents supply chain systems face around the world is managing uncertainty and understanding customers in a global market. Efforts are being made to use cutting-edge information technology to manage demand flow, supplier collaboration, and customer services. In the future, effective management of large and complex supply chains will necessitate the implementation of new strategies in an ever-changing market space. Keeping customers satisfied and happy by providing more value than the competition will be the top priority for businesses in the coming years. Supply chains with efficient product and information flow can compete and grow in the market.

Self- Assessment Questions

1. What is Supply Chain Management?
2. What are the reasons for increasing the costs throughout the supply chain?
3. What are the components of Supply Chain Management?
4. Explain the efficient chain model
5. Explain the agile model of SCM
6. What is the flexible model of SCM?
7. What are the benifits of e-SCM?

Assignments

1. What are the advantages of collaboration among members in the supply chain?
2. Describe the role of the Internet in managing supply chains in the future.
3. What are the characteristics of Efficient, Responsive, Risk Hedging and Agile Supply Chains?
4. What are the components of SCM?
5. What is e-Procurement?
6. What is e-auction?
7. What are the benefits of e-Procurement?

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

03 BLOCK

Cyber Securities Management

Block Content

Unit 1

Cyber Securities

Learning Outcomes

After completing this unit, the learner will be able to:

- identify the need for cyber security
- identify various types of cyber-attacks and cyber crimes
- analyse threats and risks within the context of the cyber security
- have an overview of cyberterrorism and vandalism

Background

One of the most significant inventions of the twenty-first century that has impacted our lives is the Internet. The way we communicate, play games, work, shop, make friends, watch films, listen to music, order meals, pay bills, wish friends happy birthdays and anniversaries, and engage in other activities has all altered as a result of the internet today. We have an app for anything you can think of. It has improved our quality of life by making it more comfortable. The days of having to wait in line to pay our electricity and phone bills are long gone. We can now pay for it from the comfort of our home or office with just a few clicks. Technology has advanced to the point where we can use it without needing a computer. We may now stay in constant contact with our friends, family, and workplace, thanks to internet-enabled cellphones, palmtops, and other devices.

These days, one can use popular applications like Skype, Gtalk, and others to conduct video conferences in addition to talking for very little money. "A one-hour online"to online video chat can now be had for less money than the cost of sending a single-page document from Delhi to Bangalore via courier or speed post. In addition, the way we utilise our standard electronics has been altered by the internet. In addition to watching popular TV series and films, television may be utilised for online video chat and phone calls to friends. Besides making calls, many utilise their mobile phones to watch the newest films.

We can stay in touch with everyone, wherever we may be. Working parents can supervise their kids at home and assist with homework from their office. A businessman

only needs to push a button to monitor his employees, office, shop, etc. It has made our lives easier in several ways. Along with the opportunities that people obtain from using internet risks related to online platforms are also rising. News reports highlights the various kinds of cyber attacks that are performed against individuals, "businesses" and government. This necessitates the requirement for cyber laws and cyber securities managment. Let's talk about, cybersecurity management, IPR related to crime, and cyberterrorism and vandalism.

Keywords

Cybersecurity, Cybercrimes, Cyberstalking, Forgery, Fraud, Cyber terrorism and vandalism

Discussion

3.1.1 Cyber Security

- Protection from cyber threats
- Definition

Cyber security is the most important matter as cyber threats and attacks are growing. Attackers are now using more sophisticated techniques to target the systems. Individuals, small-scale businesses or large organisations are all being impacted. So, all these firms whether IT or non-IT firms have understood the importance of cyber security and started to focus on adopting all possible measures to deal with cyber threats.

"Cyber security is primarily about people, processes, and technologies working together to encompass the full range of threat reduction, vulnerability reduction, deterrence, international engagement, incident response, resiliency, and recovery policies and activities, including computer network operations, information assurance, law enforcement, etc."

Cyber security is the protection of Internet-connected systems, including hardware, software, and data from cyber-attacks. It is made up of two words one is cyber and the other is security.

- Cyber is related to the technology that contains systems, networks, and programs or data.
- Whereas security is related to protection which includes systems security, network security, and application and information security.

- Protection of internet connected systems

Computer security, cybersecurity, or information technology security regards the protection of computer systems and networks from information disclosure, theft of, or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide. Cybersecurity is the protection of internet-connected systems, such as hardware, software, and data from cyber threats. The practice is used by individuals and enterprises to protect against unauthorized access to data centers and other computerized systems.

- Prevention of cyber attacks

A strong cybersecurity strategy can provide a good security posture against malicious attacks designed to access, alter, delete, destroy, or extort an organisation's or user's systems and sensitive data. Cybersecurity is also instrumental in preventing attacks that aim to disable or disrupt a system's or device's operations.

With an increasing number of users, devices, and programs in the modern enterprise, combined with the increased deluge of data much of which is sensitive or confidential, the importance of cybersecurity continues to grow. The growing volume and sophistication of cyber attackers and attack techniques compound the problem even further.

- Need for cyber security

The following enumerates the reasons why, in an increasingly digital society, cyber security is critical:

- Cyber-attacks can be extremely expensive for businesses to endure.
- In addition to financial damage suffered by the business, a data breach can also inflict untold reputational damage.
- Cyber-attacks these days are becoming progressively destructive. Cybercriminals are using more sophisticated ways to initiate cyber-attacks.

Regulations such as General Data Protection Regulation [GDPR] are forcing organisations to take better care of the personal data they hold. Because of the above reasons, cyber security has become an important part of the business and the focus now is on developing appropriate response plans that minimize the damage in the event of a cyber-attack. However, an organization or an individual can develop a proper response plan only when he has a good grip on cyber security fundamentals.

3.1.1.1 Benefits of Cybersecurity

The benefits of implementing and maintaining cybersecurity practices include:

- Business protection against cyberattacks and data breaches.
- Protection for data and networks.
- Prevention of unauthorized user access.
- Improved recovery time after a breach.
- Protection for end users and endpoint devices.
- Regulatory compliance.
- Business continuity.
- Improved confidence in the company's reputation and trust for developers, partners, customers, stakeholders, and employees.

3.1.2 Different types of cybersecurity threats

The process of keeping up with new technologies, security trends, and threat intelligence is a challenging task. It is necessary to protect information and other assets from cyber threats, which take many forms. Types of cyber threats include:

- **Malware** is a form of malicious software in which any file or program can be used to harm a computer user. This includes worms, viruses, Trojans, and spyware.
- **Ransomware** is another type of malware. It involves an attacker locking the victim's computer system files typically through encryption and demanding payment to decrypt and unlock them.
- **Social engineering** is an attack that relies on human interaction to trick users into breaking security procedures to gain sensitive information that is typically protected.
- **Phishing** is a form of social engineering where fraudulent email or text messages that resemble those from reputable or known sources are sent. Often random attacks, these messages intend to steal sensitive data such as credit card or login information.
- **Spear phishing** is a type of phishing attack that has an intended target user, organization or business.
- **Insider threats** are security breaches or losses caused by humans for example, employees, contractors or customers. Insider threats can be malicious or negligent in nature.
- **Distributed denial-of-service (DDoS) attacks** are those

in which multiple systems disrupt the traffic of a targeted system, such as a server, website or other network resource. By flooding the target with messages, connection requests or packets, the attackers can slow the system or crash it, preventing legitimate traffic from using it.

- **Advanced persistent threats (APTs)** are prolonged targeted attacks in which an attacker infiltrates a network and remains undetected for long periods to steal data.
- **Man-in-the-middle (MitM) attacks** are eavesdropping attacks that involve an attacker intercepting and relaying messages between two parties who believe they are communicating with each other.

Other common attacks include botnets, drive-by-download attacks, exploit kits, advertising, vishing, credential stuffing attacks, cross-site scripting (XSS) attacks, SQL injection attacks, business email compromise (BEC), and zero-day exploits.

3.1.3 Top cybersecurity challenges

Cybersecurity is continually challenged by hackers, data loss, privacy risk management, and changing cybersecurity strategies. The number of cyberattacks is not expected to decrease shortly. Moreover, increased entry points for attacks, such as with the arrival of the Internet of Things (IoT), increase the need to secure networks and devices.

One of the most problematic elements of cybersecurity is the evolving nature of security risks. As new technologies emerge, and as technology is used in new or different ways, new attack avenues are developed. Keeping up with these frequent changes and advances in attacks, as well as updating practices to protect against them, can be challenging. Issues include ensuring all elements of cybersecurity are continually updated to protect against potential vulnerabilities. This can be especially difficult for smaller organisations without the staff or in-house resources.

- Difficult for small concerns

Additionally, organisations can gather a lot of potential data on individuals who use one or more of their services. With more data being collected, the likelihood of a cybercriminal who wants to steal Personally Identifiable Information (PII) is another concern. For example, an organisation that stores PII in the cloud may be subject to a ransomware attack. Organisations should do what they can to prevent a cloud breach.

- Steal Information

Cybersecurity programs should also address end-user education, as employees may accidentally bring viruses into the

- Provide awareness

- Shortage of qualified employees

workplace on their laptops or mobile devices. Regular security awareness training will help employees do their part in keeping their company safe from cyber threats

Another challenge to cybersecurity includes a shortage of qualified cybersecurity personnel. As the amount of data collected and used by businesses grows, the need for cybersecurity staff to analyze, manage and respond to incidents also increases. International Information System Security Certification Consortium estimated the workplace gap between needed cybersecurity jobs and security professionals at 3.1 million.

3.1.3.1 How is automation used in cybersecurity?

Automation has become an integral component to keeping companies protected from the growing number and sophistication of cyber threats. Using artificial intelligence (AI) and machine learning in areas with high-volume data streams can help improve cybersecurity in three main categories:

- Use of AI and machine learning

- **Threat detection.** AI platforms can analyse data and recognize known threats, as well as predict novel threats.
- **Threat response.** AI platforms also create and automatically enact security protections.
- **Human augmentation.** Security pros are often overloaded with alerts and repetitive tasks. AI can help eliminate alert fatigue by automatically triaging low-risk alarms and automating big data analysis and other repetitive tasks, freeing humans for more sophisticated tasks.Triaging is a systematic process for identifying, prioritizing, and managing security incidents based on their severity and impact

Other benefits of automation in cybersecurity include attack classification, malware classification, traffic analysis, compliance analysis and more.

3.1.4 Cyberspace

- Cyber-environment

Cyber Space is the cyber environment in which all information technology contact and actions take place. Cyberspace cannot be placed spatially. It's made of intangible objects like the website, forum, social networks, personal information, reputation, and email addresses. Cyber space can be called as online global community with quick connectivity and no territorial barriers. Cyber space is the interactive system of computer networks where online communication takes place between people and where people can communicate, exchange ideas, transfer knowledge, provide social support, perform business, create artistic media, direct actions, participate in political dialogue,

- Netizens= Net+ Citizens

etc. Cyberspace, the modern frontier, is mankind's shared heritage, but sadly certain people exploit the common heritage and thus cyberspace is indeed a new frontier with various forms of crime. Now it's used to explain anything related to computers, IT, the internet, and the complex culture of the internet. The people participating in cyberspace are recognized as Netizens by the fusion of two terms 'Net' and 'citizen.' Netizens implies any person affiliated with the use of Internet, computers. IT Webster's Dictionary explains the Cyberspace, as the electronic structure of computer, bulletin board, interlinked networks that is considered to be a boundless world providing access to information, digital networking, and a type of virtual reality in science fiction. Cyberspace means "the notional environment in which electronic communication occurs or virtual reality" F. Randall Farmer and Chip Morningstar defined

3.1.5 Cybercrime/Cyber Frauds

- Criminal intention in Cyberspace

The term 'cybercrime' as a generic term that refers to all types of criminal activities perpetrated through the use of computers, the Internet on the cyber space and the www. In India, in no law has any definition of the term 'cybercrime' been given yet. In addition, the IPC 1860 does not at any time use the word 'cybercrime. Even after 2008 amendment cybercrime is not defined under the Act. "In absence of a specific definition of notion of 'cybercrime' in European Union's legal system, a range of steps proposed in the Strategy to tackle 'cybercrime' (such as initiatives to improve cooperation between law enforcement agencies) are not explicitly related to concrete and well-defined offences." Cybercrime can be defined as any unlawful act promoted or facilitated by the computer, whether computer is object of a crime, a repository of evidence relating to a crime, or an instrument that is used to commit a crime. In plain language cybercrime means crime engaged in computer network or computer. But in such simplistic and limited terms complex nature of the cybercrimes can't be sufficiently expressed. Cybercrime, according to Pavan Duggal, refers to all activities that are carried out with criminal intention in cyberspace or using internet medium. These can be either traditional or newly developed criminal activities with growth of new medium. Any conduct that basically offends human awareness may be included in the cybercrime context. Committing a crime with the usage of computer technology is a better definition of cybercrime; engaging in activities that threaten the ability of a society to maintain internal order. So, this definition covers both traditional cybercrimes and the emerging ones. This also

includes the use of computer technology, and not just the use of the networked computer technology.

3.1.6 Types of Cyber Crime

- Distingushing cyber crime from traditional crime .

We can see every day cases of cybercrime increasing and figuring out what is traditional crime and cybercrime is quite difficult. However, cybercrime can be categorized and discussed under the following headings to tackle this challenge: Cybercrime against

i. Person
ii. Property
iii. Government
iv. Society

3.1.6.1 Cybercrime against the person

This section deals with Cybercrimes committed against persons. This form of offences directly influenced the individual's personality. The following are the cybercrimes of some kinds that threat the user.

i. **Harassment via E-mails-** This form of harassment is very popular by file attachments, sending letters, & links, i.e., through e-mails. Harassment is growing nowadays as the use of social media sites like Twitter, Facebook, Orkut, Instagram etc. is increasing day-by-day.
ii. **Cyber-Stalking-** The phrase derives from the term 'stalking,' which means following a person to embarrass or harass that person. If computer or email is used for committing stalking, it is often achieved by using certain criminal activities, such as abuse of identity, extortion, defamation, spoofing, etc. Cyber stalkers may create fake websites, create fake forums, send threatening spam, make fake profile or send harassing mails for stalking another person.
iii. **Cyber Defamation** - For causing defamation, injury can be done through oral or written words, or through signs or visible representations. The person making that defamatory comment must be intended to lowering the image of person about whom the accusation was made in general public's eyes. If anybody publishing any defamatory statement by using cyber technology like website, email or any social site may amount to cyber defamation.
iv. **Hacking-** In simple language hacking means accessing in computer for which you are not authorized. Hacking isn't

necessarily a crime because when a hacker is permitted to access computer networks lawfully it is called "ethical hacking". However, hacking crosses criminal line when computer network of someone is accessed by a hacker without their permission or authority.

v. **Cracking-** It is an act of breaking into the computer system without one's consent or knowledge and tampering with the confidential information or data.

vi. **E-Mail Spoofing**- Here an attacker steals another person's identity in the form of a cell phone number and receives the SMS from the victim's cell phone number via internet and receiver. It is a very dangerous cybercrime against any human.

vii. **Carding** - It means fake credit and debit cards used by offenders to withdraw money from the bank account of the victim for their monetary gains. This type of cybercrimes often includes illegal use of ATM cards.

viii. **Child Pornography-** Defaulters in this cybercrime create/access materials or distribute that exploits the sexual exploitation of minors. This is classified among India's most heinous type of cybercrime.

ix. **Phishing-** Phishing is a financial crime in which criminal acts as a legitimate individual and sends an email demanding that person update his records or may be confirming details of his credit card and acquires confidential personal information.

i. **Online gambling-** There are millions of websites; all hosted on servers abroad, that offer online gambling. It is believed that many of these websites are fronts for money laundering. Cases of hawala transactions and money laundering over the Internet have been reported.

ii. **Data diddling-** This kind of attack involves altering raw data just before it is processed by a computer and then changing it back after the processing is completed. Electricity Boards in India have been victims to data diddling programs inserted when private parties were computerizing their systems. The NDMC Electricity Billing Fraud Case that took place in 1996 is a typical example. The computer network was used for the receipt and accounting of electricity bills by the NDMC, Delhi. Collection of money, computerized accounting, record maintenance,

and remittance in his bank were exclusively left to a private contractor who was a computer professional. He misappropriated huge amounts of funds by manipulating data files to show fewer receipts and bank remittances.

iii. **Salami attacks-** These attacks are used for the commission of financial crimes. The key here is to make the alteration so insignificant that in a single case, it would go completely unnoticed. E.g. a bank employee inserts a program, into the bank's servers, that deducts a small amount of money (say ₹ 5 a month) from the account of every customer. No account holder will probably notice this unauthorized debit, but the bank employee will make a sizeable amount of money every month.To cite an example, an employee of a bank in the USA was dismissed from his job. Disgruntled at having been supposedly mistreated by his employers the man first introduced a logic bomb into the bank's systems. Logic bombs are programs, which get activated on the occurrence of a particular predefined event. The logic bomb was programmed to take ten cents from all the accounts in the bank and put them into the account of the person whose name was alphabetically the last in the bank's rosters. Then he went and opened an account in the name of Ziegler. The amount being withdrawn from each of the accounts in the bank was so insignificant that neither any of the account holders nor the bank officials noticed the fault. It was brought to their notice when a person by the name of Zygler opened his account in that bank. He was surprised to find a sizeable amount of money being transferred into his account every Saturday. Being an honest person, he reported the "mistake" to the bank authorities and the entire scheme was revealed.

iv. **Denial of Service attack-** This involves flooding a computer resource with more requests than it can handle. This causes the resource (e.g. a web server) to crash thereby denying authorized users the service offered by the resource. Another variation to a typical denial of service attack is known as a Distributed Denial of Service (DDoS) attack wherein the perpetrators are many and are geographically widespread.It is very difficult to control such attacks. The attack is initiated by sending excessive demands to the victim's computer(s), exceeding the limit that the vic-

tim's servers can support and making the servers crash. Denial-of-service attacks have had an impressive history having, in the past, brought down websites like Amazon, CNN, Yahoo and eBay!

v. **Logic bombs-** These are event-dependent programs. This implies that these programs are created to do something only when a certain event (known as a trigger event) occurs. For even some viruses may be termed logic bombs because they lie dormant all through the year and become active only on a particular date

vi. **Trojan attacks-** A Trojan as this program is aptly called is an unauthorized program that functions from inside what seems to be an authorized program, thereby concealing what it is doing. There are many simple ways of installing a Trojan in someone's computer. A Trojan attack tricks uses into installing malicious software disguised as harmless programes.Once installed, Trojans can steal data, install other malware ,or take controll of the device all while remaining hidden from the user. Unlike viruses, Trojans can't self replicate and rely on deception to spread.

vii. **Internet time theft-**This connotes the usage by an unauthorized person of the Internet hours paid for by another person. In May 2000, the Economic Offences Wing, IPR section crime branch of Delhi police registered its first case involving theft of Internet hours. In this case, the accused, Mukesh Gupta an engineer with Nicom System (p) Ltd. was sent to the residence of the complainant to activate his Internet connection. However, the accused used Col. Bajwa's login name and password from various places causing a wrongful loss of 100 hours to Col. Bajwa. Delhi police arrested the accused for theft of Internet time. On further inquiry in the case, it was found that Krishan Kumar, son of an ex-army officer, working as a senior executive in M/s Highpoint Tours & Travels had used Col Bajwa's login and passwords as many as 207 times from his residence and twice from his office. He confessed that Shashi Nagpal, from whom he had purchased a computer, gave the login and password to him. The police could not believe that time could be stolen. They were not aware of the concept of time theft at all. Colonel Bajwa's report was rejected. He decided to approach *The Times of India*, New Delhi. They, in turn, carried a report about the inad-

equacy of the New Delhi Police in handling cybercrimes. The Commissioner of Police, Delhi then took the case into his own hands and the police under his directions raided and arrested Krishan Kumar under sections 379, 411, 34 of IPC and section 25 of the Indian Telegraph Act. In another case, the Economic Offences Wing of Delhi Police arrested a computer engineer who got hold of the password of an Internet user, accessed the computer, and stole 107 hours of Internet time from the other person's account. He was booked for the crime by a Delhi court in May 2000.

viii. **Web jacking-** This occurs when someone forcefully takes control of a website (by cracking the password and later changing it). The actual owner of the website does not have any more control over what appears on that website. In a recent incident reported in the USA the owner of a hobby website for children received an e-mail informing her that a group of hackers had gained control over her website. They demanded a ransom of 1 million dollar from her. The owner, a school teacher, did not take the threat seriously. She felt that it was just a scare tactic and ignored the e-mail.It was three days later that she came to know, following many telephone calls from all over the country, that the hackers had webjacked her website. Subsequently, they altered a portion of the website which was entitled 'How to have fun with goldfish'. In all the places where it had been mentioned, they had replaced the word 'goldfish' with the word 'piranhas'. Piranhas are tiny but extremely dangerous flesh-eating fish. Many children had visited the popular website and had believed what the contents of the website suggested. These unfortunate children followed the instructions, tried to play with piranhas, which they bought from pet shops, and were very seriously injured!

3.1.6.2 Cybercrime against the property

The second category of cybercrimes is cybercrimes against property, including computer vandalism, harmful program transmission, and unlawful computer trespassing through cyberspace and without possession of computerized information without authority.

i. **Intellectual Property Crimes**- Depriving the owner wholly or partially of his rights is a crime if it is done unlawfully. Most common types of breach of IPR may be copyright infringement, software piracy, patents, trademark infringe-

ment, service mark infringement and designs, computer source code theft, etc.

ii. **Cyber Squatting-** It involves two people claiming the similar domain name either through claiming to have first registered the name by right to use it before other or by using something which is similar to the previous one.

iii. **Cyber Vandalism-** Vandalism means intentionally damaging another's property and includes the destruction or disruption of information or data stored on a computer when network service is disrupted and stopped. These actions may take form of a computer theft, or any computer component.

iv. **Hacking Computer System-** Hackers target those like popular Facebook, Twitter, Instagram, blogging site via unauthorized computer access / control. These attacks were not intended primarily for financial gain as well as to diminish public image of a particular company or person. In April, 2013, hackers targeted MMM India.

v. **Transmitting Virus-** Virus is a type of program which is written by the programmers which attach to a pic or file and then transmit to other computers and files on a network in order to alter or delete it.

vi. **Cyber Trespass**- It means accessing in to computer or network of someone without any right or authority of owner and alters, misuse, disturb and damage data by using internet.

3.1.6.3 Cybercrime against government

Third category of the cybercrime is crime against government. Under this category cybercrime is different from other crimes. The development of internet has shown that individuals and groups use the medium of cyberspace for international governments as well as to threaten nationals of a country. Such crimes manifest themselves in terrorism when a person "cracks" into a website run by a government or the military.

- **Cyber Terrorism-** Issue of cyber terrorism concern both domestically and globally. Attacks on the Internet by Terrorists are by the distributed denial of the service attacks, hate emails and hate websites, attacks on the sensitive computer networks, etc. Cyber terrorism practices threaten the nation's security and dignity.

- **Cyber Warfare -** It refers to hacking which is politically

motivated for espionage and sabotage. It is often seen as an analogous type of information warfare to conventional warfare, however this analogy is controversial both for its political motivation and for its accuracy.

- **Distribution of Printed Software-** This includes distributed "Printed Software" from one device to others with the purpose of destroying government data and official records.
- **Possession of unauthorized information-** Using the Internet, it is quite easy to obtain any information by terrorists and to hold that information for religious, financial, political, ideological purposes.
- **Sale of illegal articles-** This would include the sale of narcotics, weapons, wildlife, etc. by posting information on websites, auction websites, and bulletin boards or simply by using email communication.

3.1.6.4 Cybercrime against the society

This is the fourth category of crime. If a crime is done with intention of causing harm via cyber means to the society at large or number of the people.

- **Child Pornography-** It involves using computer network to develop access or distribute materials that exploit the sexual abuse of minors.
- **Financial Crimes-** Phone networking and network sites where the offender will attempt to attack by sending false emails or messages via the internet, like using credit cards by illegally obtaining passwords.
- **Forgery-** This means deceiving large numbers of people by sending threatening emails since online business payments are the normal lifestyle requirement of today.

3.1.7 Use of Protection of Intellectual Property (IP) In Online Business

Intellectual Property (IP) is a legal term that refers to industrial property and copyright and related rights. The industrial property comprises the protection of patents, trademarks, industrial designs, and geographical indications. It also includes the protection of utility models, trade dresses, layout designs, or topographies of integrated circuits, where such protection exists, and protection against unfair competition including/or protection of undisclosed information/trade secrets. IP is a type

of property or asset, just as valuable (or more valuable) than physical or real property, even though it may be intangible, like knowledge. The value of IP assets relative to physical assets has increased because of the importance of technology and creative works in the modern economy. IP consists of new ideas, original expressions, distinctive names, and appearances that make products unique and valuable. IP is often traded (or "licensed") in its own right without trading in the value of an underlying product or service, using patent or other IP licenses from a rights owner to another.

- Provide new idea

Intellectual property law protects against disclosure of trade secrets and, as a result, against unfair competition. This makes intellectual property an asset that is perhaps worth more than any tangible asset. This can be seen most clearly in technology and the digital economy. Without intellectual property practices and laws, hard work is stolen and spread around the globe without paying the creator for their labour. Who, then, wants to create new works? Technical security is necessary to deter the less proficient thief and intellectual property laws are required to deal with the more serious criminals.

- Useful for serious offences

3.1.8 Crime Related to IPR

Many E-commerce Website contains product descriptions and images. Do they have the legal right to publish those descriptions and images? What about all those logos, videos, photos, clip art, icons, sound effects, and background music? They make the site more engaging. But, do they have the right to use them?

- Website Content

E-commerce, more than other business systems, often involves selling products and services that are based on IP and its licensing. Music, pictures, photos, software, designs, training modules, systems, etc. can all be traded through E-commerce, in which case, IP is the main component of value in the transaction. IP is important because the things of value that are traded on the Internet must be protected, using technological security systems and IP laws, or else they can be stolen or pirated and whole businesses can be destroyed.

- Selling product and services online

Also, IP is involved in making E-commerce work. The systems that allow the internet to networks, designs, chips, routers and switches, user interfaces, and so on are forms of IP and are often protected by IP rights. Trademarks are an essential part of E-commerce business, as branding, customer recognition, and goodwill, essential elements of Web-based business, are protected by trademark and unfair competition law.

- Forms of IPs

E-commerce businesses and internet-related businesses are

based on product or patent licensing. This is because so many different technologies are required to create a product hence-companies often outsource the development of some component of products, or share technological aspects of every product independently.Otherwise the development of high-technology products would be impossible. The economics of E-commerce depends on companies working together to share, through licensing, the opportunities and risks of business. Many of these companies are SMEs.

- Integrate the services

3.1.8.1 E-commerce and Patents

A patent is an exclusive right granted for an invention by a government. The invention may be a product or a process that provides a new way of doing something or offers a new technical solution to a problem. There are various kinds of patents. The most well-known type is the utility patent, which protects inventions. Design patents protect new, original, and ornamental designs of articles of manufacturer. Some countries also have plant patents, which are granted to anyone who invents or discovers and asexually reproduces any distinct and new variety of plants. Utility patent is the most popular patent.

- Inventing a product or process

Utility patents seek to protect new machines, systems, and other useful inventions. A utility patent is among the most valuable forms of intellectual property. It gives a 20-year right to stop anyone from copying the invention. This is not necessarily the same as having a monopoly on practicing the invention. There may be patents held by others that also cover some aspect of the invention. For example, the necessary components to build a car are an engine, a transmission, and wheels. Each of these could be protected by one or more patents held by different entities or persons. This would mean that none of them could build a car without the permission of the others. However, any of them could stop an outsider from building a car.

- Make hindrance to copying invention

Creations that can be copyrighted include virtually all forms of artistic or intellectual expression: music, artworks, recordings (audio and video), architectural drawings, choreographic works, product packaging, and computer software. In the United States, work created after 1977 is protected for the life of the author plus 70 years. Work copyrighted by corporations or not-for-profit organizations is protected for 95 years from the date of publication or 120 years from the creation, whichever is earlier.

- Protecting all kinds of talent

The original purpose of the patent system was to encourage the development of new inventions and to encourage this disclosure. Inventors are often hesitant to reveal the details of their invention fearing that someone else might copy it. This forces

them to keep their inventions secret, which do not contribute to innovation.

This fear can be overcome by a government-granted temporary monopoly on the commercial use of their invention. This acts as an incentive to disclose the details of the inventions. After the monopoly period (usually 20 years) expires, everyone else is free to practice the invention. And because of the disclosure made by the inventor, it is very easy to use the invention.

- Financial gains

This 20 years monopoly also gives the inventor a chance to recover his investments for the invention. He could use the patent to monopolise the market with no fear of competitors by enforcing his patent. He could also make a profit. Moreover, he could also demand money from others in return for a license to practice the invention. The licensing income then provides extra income. Licensing a patent can be a very lucrative business.

- Excluded from Patent protection

Today, there is an increasing number of software and business methods that are protected by patents in the United States. Under the European Patent Convention and the patent laws of several countries' members of the European Patent Organisation, computer programs and business methods as such are still expressly excluded from patent protection. In practice, however, the approach has changed in recent years as the result of long-lasting intensive, and controversial discussions and many decisions. The vast majority of applications are today considered not to claim abstract programs or business methods but to describe technical means like, for example, computer networks, for carrying out these programs or methods. To be inventive, the program or methods have to overcome a technical problem in a non-obvious way; in other words, it is not the commercial ingenuity that makes them patentable. In several other countries, computer programs and business methods are not yet patentable.

- Examples of Patent

Some examples of business methods are patents on using a single click to order goods in an online transaction, an online system of accounting, and an online rewards incentive system. In most countries, patents are available for a wide range of inventions. In the E-commerce business, it is prudent to get legal advice about whether any new business methods developed by your company may be patentable.

3.1.8.2 Trademark Issue

A trademark is a distinctive insignia, device, motto, phrase or symbol that a company affixes to the goods it produces for identification purposes. It exclusively identifies a product as

- Ownership of brand

belonging to a specific company and recognises the company's ownership of the brand. The name (or a part of that name) that a business uses to identify itself is called a trade name. Trade names are not protected by trademark laws unless the business name is the same as the product (or service) name. They are protected, however, under common law. Common law is part of British and U.S. law established by the history of court decisions that have accumulated over many years. The other main part of British and U.S. law called statutory law, arises when elected legislative bodies pass laws, which are also called statutes.

- Investing on development

The owners of registered trademarks have often invested a considerable amount of money in the development and promotion of their trademarks. Website designers must be very careful not to use any trademarked name, logo, or other identifying mark without the express permission of the trademark owner.

3.1.8.3 Copyright issues in cyberspace

- Phases of copyright issue

Copyright is comparable to other property rights, like land, in that everything on the land, from the sky to the ground, is owned by the proprietor. Copyright operates under similar principles but with a few modifications. Computer use and the internet, including downloading, uploading, copy-cut-paste, deep linking, and peer-to-peer file sharing, make it difficult to enforce copyright in cyberspace. The advancement of information has led to the emergence of new creative expressions in the creative arts, all of which are covered by copyright protection. Copyright work protection in the digital sphere continuously challenges the core tenets of copyright law. One of them is the online infringement of copyrights. Law is a response to a problem, whether it is social, economic, or technological. This general rule also applies to copyright law.

- Digitization-a boom to copyright issues

The Internet is a perfect platform for artists and writers to promote their work because of how easily it can be shared from creator to viewer and then from viewer to viewer. Technology, however, also makes it possible for any of these viewers to swiftly and easily edit, change, distort, or distribute an original work without the creator's consent. A copyright conundrum known as the "digital problem" has been brought about by the internet and digital technologies. Digital technology allows users to produce an endless number of flawless digital copies of their favorite songs, films, or books, which they can then instantly share online. The issue of copyright on the internet has expanded in scope due to digitization. It makes it easy, cheap, and quick to make high-quality copies, which can then be sent to potentially millions of people in seconds.

The Copyright Act states that using someone else's copy-

righted work without that person's consent constitutes infringement. It includes the following-

- Violation of copyright Act

- Allows the illegal use of another's copyrighted work with knowledge;
- Makes a profit from an activity that involves the use of another's property as well as
- Makes use of any of the copyright rights that are only available to the copyright owner.

Therefore, a copyright is only violated when another party performs any of the innumerable acts over which the copyright holder has the sole authority such as creating the work in any tangible form and storing it in any format through technology. It is an infraction to digitise a work without the owner of the copyright's consent. An international mechanism for transmitting and copying information is the Internet. This creates several issues for copyright law and opens the door to copyright being violated in previously unimaginable ways.

So, we can hereby conclude that with the increasing usage of the internet, copying has become so simple and easy that widespread Intellectual Property rights infringement is occurring, violating the rights and interests of the IPR owners. The present Indian Laws on Intellectual Property Rights and Cybercrimes don't have enough provisions to deal with the issues in IPR starting from Domain Name Disputes like Cybersquatting to link law disputes as discussed earlier. There are various directions provided by international conventions and treaties to protect the rights of IPR owners in cyberspace which are helping the E-business to expand without suffering any harm. Detailed provisions governing IP rights in cyberspace are needed.

- Lack of provisions

3.1.9 Online Crime, Terrorism, and Welfare

Internet crime is any illegal online activity committed on the Internet, through the Internet.

Cyberterrorism

Cyberterrorism is often defined as any premeditated, politically motivated attack against information systems, programs, and data that threatens violence or results in violence. The definition is sometimes expanded to include any cyber-attack that intimidates or generates fear in the target population. Attackers often do this by damaging or disrupting critical infrastructure.

- Attack towards the information system

The Federal Bureau of Investigation [FBI] views a cyberterrorist attack as different from a common virus or denial of service (DoS) attack. According to the FBI, a cyberterrorist attack is a type of cybercrime explicitly designed to cause physical harm.

- Cause physical harm

However, there is no consensus among governments and the information security community on what qualifies as an act of cyberterrorism.

- After effects

Other organisations and experts have said that less harmful attacks can be considered acts of cyberterrorism. When attacks are intended to be disruptive or to further the attackers' political agenda, they can qualify as cyberterrorism, according to these groups. In some cases, the differentiation between cyberterrorism attacks and ordinary cybercrime lies in the intention: the primary motivation for cyberterrorism attacks is to disrupt or harm the victims, even if the attacks do not result in physical harm or cause extreme financial harm.

- Disruption of critical infrastructure

In other cases, the differentiation is tied to the outcome of a cyber-attack. Many cybersecurity experts believe that an incident should be considered cyberterrorism if it results in physical harm or loss of life. This can be either direct or indirect harm through damage to or disruption of critical infrastructure.

- Physical harmnot a prerequisite for cyber attack

Physical harm is not always considered a prerequisite for classifying a cyber-attack as a terrorist event. The North Atlantic Treaty Organization, known as NATO, has defined cyberterrorism as a cyber-attack that uses or exploits computer or communication networks to cause "sufficient destruction or disruption to generate fear or to intimidate a society into an ideological goal." According to the U.S. Commission on Critical Infrastructure Protection, possible cyberterrorist targets include the banking industry, military installations, power plants, air traffic control centers, and water systems.

Examples of cyberterrorism include the following:

vii. **Disruption of major websites.** The intent here is to create public inconvenience or stop traffic to websites containing content the hackers disagree with.

viii. **Unauthorized access.** Attackers often aim to disable or modify communications that control military or other critical technology.

ix. **Disruption of critical infrastructure systems.** Threat actors try to disable or disrupt cities, cause a public health crisis, endanger public safety or cause massive panic and fatalities. For example, cyberterrorists might target a water treatment plant, cause a regional power outage or disrupt a pipeline, oil refinery or fracking operation.

- Cyber spying

x. **Cyberespionage.** Governments often carry out or sponsor cyberespionage attacks. They aim to spy on rival nations and gather intelligence, such as troop locations or

military strategies. It is also called cyber spying which involves attact aganist a business or government entity.

3.1.9.1 Defending against cyberterrorism

The key to countering cyberterrorism is to implement extensive cybersecurity measures and vigilance.

Cyberterrorism has mostly targeted government entities. However, that is changing, and businesses are becoming targets as well. As a result, businesses and other organisations must ensure that all internet of things devices is secured and inaccessible via public networks. To protect against ransomware and similar types of attacks, organisations must regularly backup systems, implement continuous monitoring techniques, and use firewalls, antivirus software and anti-malware. Companies must also develop IT security policies to protect business data. This includes limiting access to sensitive data and enforcing strict password and authentication procedures, like two-factor authentication or multifactor authentication.

- Develop policy for protection

The National Cyber Security Alliance is a public-private partnership to promote cybersecurity awareness. It recommends training employees on safety protocols and how to detect a cyber-attack and malicious code. The Department of Homeland Security coordinates with other public sector agencies and private sector partners. It shares information on potential terrorist activity and how to protect national security, as well as counter terrorism measures. On a global level, 66 countries, including the United States, participate in the Council of Europe's Convention on Cybercrime. It seeks to harmonise international laws, improve investigation and detection capabilities, and promote international co-operation to stop cyberwarfare.

- Agency for protection

3.1.9.2 Vandalism

Cyber vandalism can be defined as "a cyber-attack without any obvious rational criminal, political, or ideological motive, usually defacement of a vulnerable website to display the hacker's prowess". An example of cyber vandalism is the act of brand-jacking, or using a company's identity to impersonate them online. Kellogg's suffered from brand-jacking when cyber vandals built a website resembling its own and then used the site to create inappropriate videos featuring the brand's Tony the Tiger mascot.

- Brand-Jacking

Unlike digital espionage, where the purpose is to steal and misuse data, digital vandalism only seeks to damage, destroy, or disable data, computers, or networks. Cyber vandalism can impact businesses drastically, including the ability of your customers to access services as well as financial loss or impact to your brand or reputation.

- Affects goodwill

Summarised Overview

The World Wide Web (WWW) and other Internet-related developments have led to the expansion of cyberspace and the usage of IPR in it. Examining IPR such as, copyright in cyberspace reveals both new opportunities and risks. However, these new developments also bring new concerns, many of which infringe upon copyright holders' rights. These hazards are typically greater than the opportunities that the internet presents. This implies that further laws are needed to safeguard copyright in cyberspace.

Cyberspace is constantly evolving, which makes it challenging for the law to act swiftly. Out of all the several kinds of intellectual property rights (IPR) in the internet, copyright appears to be the most significant and contentious. This has prompted international copyright regimes to demand greater regulation of the internet. To control cyberspace and safeguard copyrights, greater international collaboration is required.

Furthermore, it is the responsibility of society to educate people on the value of copyright protection and how it enables the detection, management, and prevention of any illegal use. Nowadays, a large number of people create digital stuff that must be secure. Internet users should become far more knowledgeable about the reasons for the importance of copyright protection to prevent unauthorized use.

Self- Assessment Questions

1. What do you mean by Cyberspace?
2. Explain various types of Cybercrimes in India.
3. What are the cyber crimes identified in copyrights?
4. Explain the terms cyber terrorism and cyber vandalism
5. Why is the copyright issue on the internet so unique?

Assignments

1. Why privacy issue is important when dealing with E-commerce? Explain with examples.
2. Describe how online website operations can be protected from hackers.
3. Explain the role of IPR in cyberspace. Describe the crime related to IPR.

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

Unit 2

Network and Website Security Risks Management

Learning Outcomes

After completing this unit, the learner will be able to:

- assess the cyber risk management
- familiarise the concept of privacy in digital signature
- identify E-business risk management issues
- examine the concept of firewall and security

Background

Risk management is the process that allows IT managers to balance the operational and economic costs of protective measures and achieve gains in mission capability by protecting the IT systems and data that support their organisations' missions. This is a process that is not exclusive to the IT world; in fact, it influences every aspect of our everyday life where decisions are made. Consider the situation of home security. For increased property protection, a lot of people choose to install home security systems and pay a monthly service provider charge to have these systems monitored. The homeowners have presumably considered the importance of their family's safety and the value of their possessions, which constitute a basic "mission" while comparing the cost of system installation and monitoring.

An organisational unit's head is responsible for making sure the organisation has the resources necessary to carry out its objective. These mission owners need to figure out what security features their IT systems need to have to support their missions at the appropriate level when facing actual threats. Since most businesses have limited funds for IT security, IT security expenditures need to be carefully considered in the same way as other management choices. When applied properly, a well-organised risk management approach can assist management in determining the right controls to provide the security capabilities that are critical to the mission.

The necessity for you to guard your business against cyber-attacks has never been more crucial as network security risks are continually on the rise. Regardless of whether your

company's data and information are stored on a hard drive or sent through e-mails, being wary of network security risks, knowing how to prevent them, and hiring a managed IT security provider can help you alleviate any possible data breaches.

Keywords

Privacy risk management, E-business risk management, Firewall security framework

Discussion

3.2.1 Network Security Risk

- Threats to network
- Identifies the threats and offer solutions

Cybersecurity risk management has become a vital part of broader enterprise risk management efforts. Today's businesses in all sectors rely on information technology to perform essential operations, which expose them to risks such as employee error, natural catastrophes, cybercriminals, and other cybersecurity threats. These threats can take down vital systems or cause mayhem in other ways which could result in lost profits, stolen data, reputational harm over time, and fines from the authorities.

Cyber risk management programs can help lessen the effect and likelihood of threats; however, these risks cannot be completely eradicated. Businesses utilise the cybersecurity risk management process to identify the most important threats to their operations and to choose the best IT security solutions for their IT infrastructures, resource availability, and business priorities.

Here are some five most common network security threats you need to be vigilant about:

i. **Phishing-** This type of online fraud is designed to steal sensitive information such as credit card numbers and passwords. Phishing attacks impersonate reputable banking institutions, websites, and personal contacts, which come in the form of immediate phishing e-mails or messages designed to look legitimate.Once you click the URL or reply to the messages, you are prompted to enter your financial details or use your credentials, which then send your data to the malicious source.

ii. **Computer Viruses-** These are pieces of software designed to spread from one computer device to another. Mostly they are downloaded from particular websites or sent as e-mail attachments with the intent of infecting your computer as well as other computers on your contact list through systems on your network. They can disable your security settings, send spam, steal and corrupt data from your computer, and even delete every single thing on your hard drive.

iii. **Malware/Ransomware-** Malware is a malicious software mostly used by criminals to hold your system, steal your confidential data, or install damaging programs in your device without your knowledge. It spreads spyware, Trojans, and worms through pop-up ads, infected files, bogus websites, or e-mail messages.On the other hand, ransomware is a type of malware where cyber-criminals lock your device through a bad app or phishing e-mails and then request a ransom to unlock the device. It can hinder you from running applications, encrypting your files, and even from completely using your device.

iv. **Rogue Security Software-** This is a malicious software that deceives users by making them believe that their security measures are not up-to-the-minute or their computer has a virus. They then offer to help you install or update the user's security settings by asking you to pay for a tool or download their program to help do away with the alleged viruses. This can lead to the installation of actual malware on your device.

v. **Denial-of-Service Attack -** A denial-of-service attempts to hinder legitimate users from accessing services or information from a website. It happens when malicious attackers overload a website with traffic. It is carried out by one computer and its internet connection, which may enable the intruder to access your credentials. A distributed denial-of-service is similar to the denial-of-service but is harder to overcome. This is because it is launched from different computers that are distributed all over the globe. The network from these compromised computers is called a botnet.

How To Prevent Network Security Threats

- Never pay ransom to any individual

- Always identify any unusual traffic activity
- Reduce visits to unfamiliar websites
- Use authentication as well as strong passwords
- Be cautious of public Wi-Fi
- Keep your antivirus up-to-the-minute
- Employ the services of a managed IT security provider

What is Privacy Risk?

Privacy risk is the likelihood that individuals will experience problems resulting from data processing, and the impact of these problems should they occur. Privacy risk includes but is not limited to technical measures that lack appropriate safeguards, social media attacks, mobile malware, third-party access, negligence resulting from improper configuration, outdated security software, social engineering and lack of encryption.

- Problem in data processing

3.2.2 Creating and Implementing a Privacy Risk Management Framework

Fortunately, addressing the risks and opportunities originating from privacy related issues is not very exceptional, even though some privacy risks may prove to be extremely potent.

Actually, organisations that are pretty mature and have institutionalised risk management will find that they can manage it as another type of risk, much like they can manage risks related to technology, the economy, or the environment.

- Generating framework to protect from all type of risk

The globally recognised COBIT 2019 framework can serve as a foundation to ensure effective enterprise governance of information and technology (EGIT). It can help an enterprise govern data, implement internal and external security, and determine the components needed from other frameworks. It is a useful tool for implementing a privacy risk management framework, particularly by focusing on the four management domains:

Align, Plan and Organise (APO)

Build, Acquire and Implement (BAI)

Deliver, Service and Support (DSS)

Monitor, Evaluate and Assess (MEA)

The ultimate goal is to have privacy become an organisation's default mode of operation, which can only be achieved by including it in the design of everything that comes into

contact with the personal information of stakeholders. People are no longer required to worry about whether or how their information will be protected because privacy is now considered the norm. Their privacy will not be compromised even if they take no action. Privacy by design can (and should) guide the development of any policy or process dealing with personal information. It is crucial to make sure that the principles are ingrained in an organisation's risk management system as well as all of its programmes and procedures that handle personal information to successfully reduce privacy risks.

3.2.3 Cybersecurity Risk Management

- Adressing of cyber security threats

Cybersecurity risk management is an ongoing process of identifying, analysing, evaluating, and addressing your organisation's cybersecurity threats. Cybersecurity risk management isn't simply the job of the security team; everyone in the organisation has a role to play. Often siloed employees and business unit leaders view risk management from their business function. Regrettably, they lack the holistic perspective necessary to address risk comprehensively and consistently.

- Keep everyone out of trouble

Each function has its agenda, often with limited understanding and empathy for others. IT leads with fresh ideas and new technologies, often viewing security and compliance as annoying roadblocks to progress. Security knows safety but is often out of touch with regulations and evolving technologies. The sales team is looking to keep their customers happy, clamouring for an efficient way to complete security audits. Compliance wants to keep everyone out of trouble with strict adherence to regulations, often operating without an in-depth understanding of security.

Effectively managing cybersecurity risk requires all functions to operate with clearly defined roles and be tasked with specific responsibilities. The days of siloed departments stumbling along in disconnected confusion are over. Today's risk landscape requires a unified, coordinated, disciplined, and consistent management solution. Below are some key risk management action components all organisations must keep in mind:

- Development of robust policies and tools to assess vendor risk
- Identification of emergent risks, such as new regulations with business impact
- Identification of internal weaknesses such as lack of two-factor authentication

- Mitigation of IT risks, possibly through training programs or new policies and internal controls
- Testing of the overall security posture
- Documentation of vendor risk management and security for regulatory examinations or to appease prospective customers

3.2.4 Cyber Security Risk Management Process

- Managing process

When it comes to managing risk, organisations generally follow a four-step process beginning with identifying risk. Next, risk is assessed based on the likelihood of threats exploiting vulnerabilities and the potential impact. Then,risks are prioritised, with organizations choosing from a variety of mitigation strategies. The fourth step, monitoring, is structured to risk response and control current despite a continually shifting environment.

The good news for organisations looking to assess their risk level is that plenty of help is available. The National Institute of Standards created a third-party risk management framework known as NIST Special Publication 800-30 to guide federal information system risk assessments. The 800-30 framework expands on the instruction of Special Publication 800-39. It is closely related to Special Publication 800-53, another third-party risk management framework that provides a catalog of security and privacy controls for federal information systems. Though NIST SP 800-30 isn't mandatory in the private sector, it provides a helpful guide for all organisations assessing risk.

- Understanding threats,vulnerability,and consequences

i. **Identifying Cybersecurity Risks-** Gartner defines IT risk as "the potential for an unplanned, negative business outcome involving the failure or misuse of IT." In other words, what are the odds of an existing threat exploiting a vulnerability, and, if so, how dire would the consequences be? Risk identification is the first step in the management process. Modern security teams have their hands full with the growth of IT systems, the explosion of regulations, and the complications of COVID creating potential risks around every corner. When you're looking to identify risk, you must start by understanding threats, vulnerabilities, and the consequences of their convergence.Threats are circumstances or events with the potential to negatively affect an organisation's operations or assets through unauthorised access to information

- Forms of threats

systems. Threats can manifest everywhere—in the form of hostile attacks, human errors, structural or configuration failures, and even natural disasters. Vulnerabilities can be defined as weaknesses in an information system, security procedure, internal control, or implementation that can be exploited by a threat source. Often the result of inadequate internal functions like security, and vulnerabilities can also be found externally in supply chains or vendor relationships.Consequences can best be defined as the adverse results that occur when threats exploit vulnerabilities. Their impact measures the severity of consequences, and your organisation will need to estimate such costs when attempting to assess risk. Keep in mind that these costs usually come from lost or destroyed information, which can be a significant business setback for any organization.

- Consequences

ii. **Assess Cybersecurity Risk**s- Risk assessments provide an excellent opportunity to emphasise the importance of security across your organisation. Assessing risk allows your team to practice communication and cooperation to play a critical role in future risk management. What is your organisation's level of risk? Assessment is the all-important step when that answer becomes clear. Start by naming all assets and prioritising their importance. Second, identify all possible threats and vulnerabilities in your environment. At this point, address all known vulnerabilities with appropriate controls. Next, attempt to determine the likelihood of a threat event occurring and conduct an "impact analysis" to estimate its potential consequences and cost impact. Your resulting risk determination will serve as a guide to inform risk management decisions and risk response measures moving forward.The NIST Guide for Conducting Risk Assessments discussed in Special Publication 800-30 can help your team with a four-step progression. Prepare for your assessment by clarifying your purpose, scope, constraints, and risk model/analytics to be used. Conduct your assessment to list risks by likelihood and impact for an overall risk determination. These results will be shared and drive your team's mitigation efforts across the enterprise. Finally, this guide directs the maintenance of your assessment by continually monitoring environments.

- Impact analysis

iii. **Identify possible Cybersecurity Risk Mitigation Measures**- Identifying and assessing risk is just the begin-

ning. What is your organisation going to do about the risk you find? What will your mitigation response be for managing risk? How will you manage residual risk? History tells us that the most successful risk management teams have a well-thought plan in place to guide their risk response strategy. The all-important third step of response starts by understanding all your options for risk mitigation—your team can employ either technological or best practice methods, ideally a combination of both. Technological risk mitigation measures include encryption, firewalls, threat-hunting software, and engaging automation for increased system efficiency. Best practices for risk mitigation include:

- Understanding all risk response strategies

- Cybersecurity training programs
- Updating software
- Privileged access management (PAM) solutions
- Multi-factor access authentication
- Dynamic data backup

Smart organisations know to base their risk response measures and risk management posture on real data. They prioritise risks as well as mitigation solutions using concrete data from real-world applications.

That brings us to residual cybersecurity risk. This is the risk left over after applying all mitigation measures—the type of unavoidable risk you can't do much about. You have two choices for residual risk—learn to live with it or transfer it to an insurance provider who will shoulder it for a fee. Cybersecurity insurance provides a last-ditch option for lessening residual risk and stands to become more popular as the damage cost of cyber incidents becomes easier to calculate.

- Cyber security insurance

Speaking of damage costs, it has become increasingly necessary for organisations to estimate these cybersecurity risks accurately. When estimating damage costs of cybersecurity risk, you need to keep three types of expenses in mind. Operational costs involve lost time or resources and are easy to calculate. Fiscal costs can include fines for non-compliance or lost income when existing clients defect or new opportunities are lost. The hardest to calculate is the reputational cost associated with breaches that violate customer privacy and trust.

- Types of damage costs

iv. **Use ongoing Monitoring** -Your organisation has identified, assessed, and mitigated the risks in your environ-

ment. In a perfect world, that would be enough. But as we know, change is a constant, and your team will need to monitor environments to ensure internal controls maintain alignment with IT risk.

Your organisation will want to monitor:

Regulatory change- Staying abreast of all regulations and their shifts will ensure your internal controls align with outside expectations.

Vendor risk- Be sure to assess and document security and compliance controls as new vendors are on board. Remember, their shortcomings can become your headaches.

Internal IT usage- Know what technology your internal teams use and how they use it to stay ahead of potential gaps.

3.2.5 E-business risk management issues

i. **Online Security-** There is a whole range of security threats out there to beware of, including malware, phishing attacks, hacking and spam mail.To defend against these threats, make sure that you update your platform's operating system regularly, and use a strong SSL (Secure Sockets Layer).

ii. **System Reliability-** The Internet service provider (ISP) server could crash, your online payment system could show errors and the E-commerce plugin could have bugs. Except keeping all operating systems and APIs updated, these are just some things that may happen outside of our control.

iii. **Privacy Issues-** Customers' personal data could be compromised and used for spamming, identity theft and unsolicited marketing.In addition to the online security measures previously mentioned, make sure to require customers to use strong passwords.

iv. **Customer Disputes-** A customer might not have received their order, their credit card was charged twice, or the product they received didn't fit the online description.Whether the customer is right or not, it's important to always have great customer service and to rectify all possible mistakes that were made.

v. **Credit Card Fraud-** Someone could use a stolen credit card to make an online purchase, or a hacker could use stolen credit data from other customers in your system. No matter how good your online security measures are, al-

ways watch out for any suspicious transactions.

vi. **Intellectual Property Issues-** Your website images, product descriptions, logos, videos, music, as well as your products, could be copied by others, or violate someone else's intellectual property.

vii. **SEO-** Google or other platforms could do a complete makeover of their algorithm at any time, and make your website traffic drop significantly overnight.

viii. **Taxation-** You might not be including the appropriate sales tax in your sales, or you are not paying fair shipping and/or import taxes depending on your shipping destination.

ix. **Return of Goods and Warranty-**These are the common headaches when dealing with product returns. It includes Increase in supply chain costs and not being able to resell the items at their original price.

x. **Warehousing and Logistics Issues-** You could run out of stocks while orders are coming in, a product shipment might be delayed, or a parcel could be delivered to the wrong recipient.These are risks that come with the territory when running an E-commerce business.

- Electronic authentication of information

3.2.6 Digital signature

A digital signature is an electronic, encrypted, stamp of authentication on digital information such as email messages, macros, or electronic documents. A signature confirms that the information originated from the signer and has not been altered.

Figure 3.2.1 Digital Signature

The following is an example of a signature line.

Signing certificate: To create a digital signature, you need a signing certificate, which proves identity. When you send a digitally-signed macro or document, you also send your certificate and public key. Certificates are issued by a certification authority, and like a driver's license, can be revoked. A certificate is usually valid for a year, after which, the signer must renew, or get a new, signing certificate to establish identity.

- To prove identity

Certificate authority (CA): A certificate authority is an entity similar to a notary public. It issues digital certificates, signs certificates to verify their validity and tracks which certificates have been revoked or have expired.

- Issues digital certificate

Digital signature assurances

The following terms and definitions show what assurances are provided by digital signatures:

Authenticity The signer is confirmed as the signer.

Integrity The content has not been changed or tampered with since it was digitally signed.

Non-repudiation Proves to all parties the origin of the signed content. Repudiation refers to the act of a signer denying any association with the signed content.

Notarization Signatures in Microsoft Word, Microsoft Excel, or Microsoft PowerPoint files, which are time stamped by a secure time-stamp server, under certain circumstances, have the validity of a notarization.

To make these assurances, the content creator must digitally sign the content by using a signature that satisfies the following criteria:

The digital signature is valid.

The certificate associated with the digital signature is current (not expired).

The signing person or organisation, known as the publisher, is trusted.

Important: Signed documents, which have a valid time stamp, are considered to have valid signatures, regardless of the age of the signing certificate.

The certificate associated with the digital signature is issued to the signing publisher by a reputable certificate authority (CA).

3.2.7 Firewall

An Internet firewall is a system or group of systems that enforces a security policy between an organisation's network and the Internet. The firewall determines which insider services

- Protection wall

may be accessed from the outside, which outsiders are permitted access to the permitted inside services, and which outsider services may be accessed by insiders. For a firewall to be effective, all traffic to and from the Internet must pass through the firewall, where it can be inspected. The firewall must permit only authorized traffic to pass, and the firewall itself must be immune to penetration. Unfortunately, a fire system cannot offer any protection once an attacker has got through or around the firewall.

- Defence for protecting Information

It is important to note that an Internet is not just a router, a bastion host, or a combination of devices that provides security for a network. The firewall is part of an overall security policy that create a perimeter defense designed to protect the information resources of the organization. This security policy must include published security guidelines to inform users of their responsibilities; corporate policies defining network access, service access, local and remote user authentication, dial-in and dial-out, disk and data encryption, and virus protection measures and employee training. All potential points of network attack must be protected with the same level of network security. Setting up an Internet firewall without a comprehensive security policy is like placing a steel door on a tent.

- Control access from a protected network

A firewall is an approach to security. It helps implement a larger security policy that defines the services and access to be permitted, and it is an implementation of that policy in terms of a network configuration, one or more host systems and routers, and other security measures such as advanced authentication in place of static passwords. The main purpose of a firewall system is to control access to or from a protected network, i.e. a site. It implements a network access policy by forcing connections to pass through the firewall, where they can be examined and evaluated.

- Located at higher-level gateway

A firewall system can be a router, a personal computer, a host, or a collection of hosts, set up specifically to shield a site or a subnet from protocols and services that can be abused for hosts outside the subnet. A firewall system is usually located at a higher-level gateway such as a site's connection to the Internet. However, firewall systems can be located at lower-level gateways to provide protection for some smaller collection of hosts or subnets.

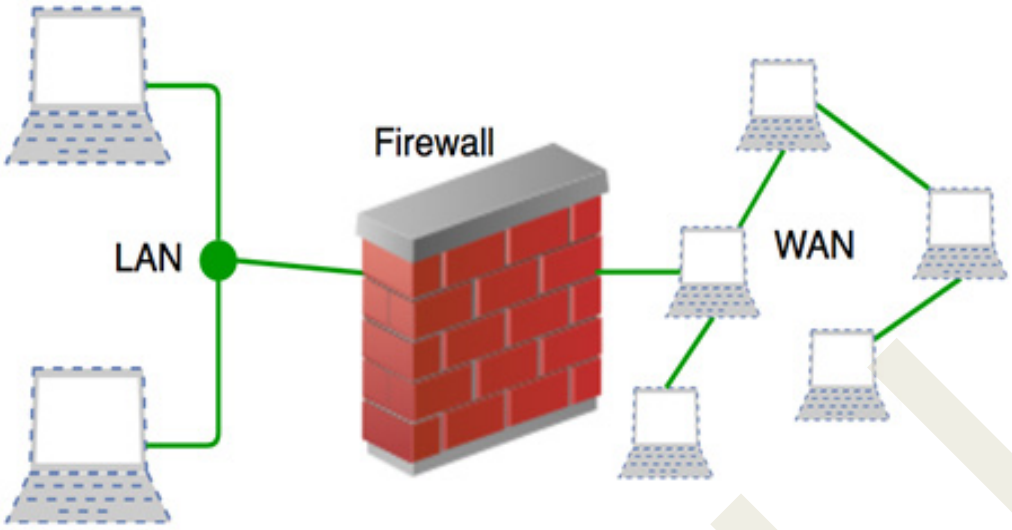

Figure 3.2.2 Firewall System

Why Firewalls

- Provide higher-level security

The general reasoning behind firewall usage is that without a firewall, a subnet's systems expose themselves to inherently insecure services, and to probes and attacks from hosts elsewhere on the network. In a firewall-less environment, network security relies totally on host security and all hosts must, in a sense, cooperate to achieve a uniformly higher level of security. The larger the subnet, the less manageable it is to maintain all hosts at the same level of security. As mistakes and lapse in security become more common, break-ins occur not as the result of complex attacks, but because of simple errors in configuration and inadequate passwords.

A firewall approach provides numerous advantages to sites by helping to increase overall host security. The following sections summarise the primary benefits of using a firewall.

3.2.7.1 Advantages of using Firewall

Protection from unauthorised access: A firewall can greatly improve network security and reduce risks to hosts on the subnet by filtering inherently insecure services. As a result, the subnet network environment is exposed to fewer risks, since only selected protocols will be passed through the firewall.

For example, a firewall could prohibit certain vulnerable service such as Network File System (NFS) from entering or leaving a protected subnet. This provides the benefit of preventing the services from being exploited by outside attackers, but at the same time permits the use of these services with greatly reduced risk of exploitation.

Controlled Access to Site Systems- A firewall also provides the ability to control access to site systems. For example, some hosts can be made reachable from outside networks, whereas others can be effectively sealed off from unwanted access. A site could prevent outside access to its hosts except for special cases such as mail servers or information servers. This brings to the fore an access policy that firewalls are particularly adept at enforcing: do not provide access to host or services that do not require access. If, for example, a user requires little or no network access to her desktop workstation, then a firewall can enforce this policy.

Concentrated Security- A firewall can actually be less expensive for an organisation in that all or most modified software and additional security software could be located on the firewall systems as opposed to being distributed on many hosts. In particular, one-time passwords systems and other add on authentication software could be located at the firewall as opposed to each system that needed to be accessed from the Internet.

Enhanced Privacy- Privacy is of great concern to certain sites, since what would normally be considered innocuous information, might actually contain clues that would be useful to an attacker. Using a firewall, some sites wish to block services such as finger and Domain Name Service. Finger displays information about users, such as their last login time, whether they have read mail, and other items. But finger could leak information to attackers about how often a system is used, whether the system has active users connected, and whether the system could be attacked without drawing attention.Firewalls can also be used to block DNS information about site systems; thus, the names and IP addresses of site systems would not be available to internet hosts. Some sites feel that by blocking this information, they are hiding information that would otherwise be useful to attackers.

Need for Usage Statistics on Network- If all access to and from the Internet passes through a firewall, the firewall can log accesses and provide valuable statistics about network usage. A firewall, with appropriate alarms that sound when suspicious activity occurs, can also provide details on whether the firewall and network are being probed or attacked.It is important to collect statistics about network usage and evidence of probing for a number of reasons. Of primary importance is, knowing whether the firewall is withstanding probes and attacks, and determining whether the controls on the firewall are adequate. Network usage statistics are also important as input into network requirements studies and risk analysis activities.

Policy Enforcement- Lastly, but perhaps most importantly, a firewall provides the means for implementing and enforcing a network access policy. In effect, a firewall provides access control to users and services. Thus, a network access policy can be enforced by a firewall, whereas without a firewall, such a policy depends entirely on the cooperation of the users. A site may be able to depend on its own users for their cooperation. However, it cannot or it should not depend on the Internet users in general.

3.2.7.2 Types of Firewalls

There are two main types of firewalls: host-based and network-based.

i. **Host-based firewalls:** Every network node has a host-based firewall installed, which regulates all incoming and outgoing packets. It is a software programme, or group of programmes, included with the operating system. Because network firewalls are unable to offer protection inside a trusted network, host-based firewalls are required. A host firewall guards against intrusions and illegal access for every host.
ii. **Network-based Firewalls:** Network firewalls function at the network level. In other words, these firewalls filter all incoming and outgoing traffic across the network. It protects the internal network by filtering the traffic using rules defined on the firewall. A network firewall might have two or more Network Interface Cards (NICs). A network-based firewall is usually a dedicated system with proprietary software installed.

3.2.7.3 Real-Time Applications of Firewall

i. **Corporate networks:** Many businesses employ firewalls to guard against unwanted access and other security risks on their corporate networks. These firewalls can be set up to only permit authorized users to access particular resources or services and to prevent traffic from particular IP addresses or networks.
ii. **Government organizations:** Government organizations frequently employ firewalls to safeguard sensitive data and to adhere to rules like Health Insurance Probabilty and Accountability Act [HIPAA] or Payment Card Industry Data Security Standard [PCI-DSS]. They might make use of cutting-edge firewalls like Next-generation firewalls (NGFW), which can detect and stop intrusions as well as manage access to particular data and apps.

iii. **Service providers:** Firewalls are used by service providers to safeguard their networks and the data of their clients, including Internet Service Providers [ISPs], cloud service providers, and hosting firms. They might make use of firewalls that accommodate enormous volumes of traffic and support advanced features such as Virtual Private Network [VPN]and load balancing.

iv. **Small enterprises:** Small firms may use firewalls to separate their internal networks, restrict access to specific resources or applications, and defend their networks from external threats.

v. **Networks at home:** To guard against unwanted access and other security risks, many home users employ firewalls. A firewall that many routers have built in can be set up to block incoming traffic and restrict access to the network.

vi. **Industrial Control Systems (ICS):** Firewalls are used to safeguard industrial control systems against illegal access and cyberattacks in many vital infrastructures, including power plants, water treatment facilities, and transportation systems.

Summarised Overview

Malicious cyber activity is a growing challenge for organisations worldwide. It ranges from straightforward online fraud to sophisticated cyber espionage and calculated cybercrime, used to steal secrets and other information stored digitally on systems and networks. Malicious cyber activities have the potential not just to seriously harm an organisation's business and reputation, but also to compromise a nation's security, stability and prosperity. A number of incidents have spiked in recent years, as perpetrators aggressively exploit flaws in digital infrastructure. This has catapulted cyber security to front-of-mind for business leaders, regulators and politicians who are anxious to shore up defenses and improve resilience. Cyber adversaries are constantly devising new ways to exploit vulnerable systems and networks. This is forcing organisations from bank to energy companies, and from government agencies to charities to strengthen their cyber defenses.

Every commercial or application services exposed on the internet will have its own security requirements based on the functionality. A detailed study and feasibility analysis must be done before implementing the most appropriate of security control systems. To beat the world of threats and hackers, the focus has to be on implementation and then continual improvisations to meet all the possible current and future threats. A firewall is one of the many solutions available in today's world of cybersecurity to control this external threat.

Self-Assessment Questions

1. What are the common cyber-attacks?
2. Explain firewalls? What are the advantages and disadvantages of firewalls?
3. Why is firewalls used?
4. What are the elements of cyber security?
5. Explain cybersecurity risk management process.

Assignments

1. Discuss the areas where privacy becomes an issue in computer usage.
2. What is the importance of privacy with regard to computer information system?
3. Why should a firewall be able to support a 'deny all services, except those specifically permitted', if this is not the policy expected to be used?

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

04 BLOCK Cyber Regulations

Block Content

Unit 1

Cyber Law

Learning Outcomes

After completing this unit, the learner will be able to:

- describe the scope of cyber law
- discuss the issues relating to the investigation
- familiarise the term cyber forensic

Background

Economic and societal factors both contribute to crime. It is just as old as civilization. Numerous historical texts, dating back to prehistoric times, as well as mythological tales, have discussed crimes committed by people, whether they be against the state, such as treason and spying, or against another person, such as common theft and burglary. Written in 350 BC, Kautilya's *Arthashastra* is regarded as an authentic administrative treatise in India. It addresses a variety of crimes, security measures that rulers should take, potential crimes in a state, etc., and it also recommends punishment for a list of specified transgressions. For the above transgressions, several forms of punishment have been established, and the idea of giving the victims their losses back have also been covered.

The same laws and regulations that govern the operations of all businesses must apply to business that operate on the Web. If they do not, they will face the same penalties like fines, reputation payments, court-imposed dissolution, and even jail time for officers and owners. Web businesses face two additional complicating factors as they try to comply with the law. First, the internet extends a company's reach beyond traditional boundaries. A business that uses the Internet immediately becomes an international business. Thus, a computer can become subject to much more quickly than a traditional brick-and-mortar business based in one country. Second, the Web increases the speed and efficiency of business communications.

In a cyber-crime, computer or the data itself the target or the object of offence or a tool in committing some other offence, providing the necessary inputs for that offence. All such acts of crime will come under the broader definition of cyber-crime. Let us now discuss in detail, the Information Technology Act -2000. Before going into the relevant provisions of the IT Act, let us discuss the history behind such legislation in India, the circumstances under which the Act was passed, and the purpose or objectives of passing it.

Keywords

Cyberspace, cybersecurity, cyber forensic, digital security, cybercrimes, IT Act,2000,

Discussion

4.1.1 Introduction

- Integral part in our life

Internet has become the integral part of our daily life. Directly or indirectly, everyone has happened to use it at some point in time due to wide spread of it. Gradually, internet has been included in the day-to-day life of the people and so is the urge of every segment of the society to learn the use of it has increased, unless otherwise people in greater extent have started feeling that life will be measurable. Rich to poor, kids to old aged people, in every continent and in each country, it has become a source of various information. As for example, If a teenaged girl wants to check for a meaning of a word, she would very conveniently check it in the World Wide Web (WWW) then checking it on a physical dictionary. The digital dictionary is less time consuming and it gives various information along with the meaning unlike traditional dictionary to say the digital dictionary will also provide the related pronunciations of the word, where it was originated and used, similar sentences and whole lot of synonymies and antonymies. Another example can be the police force uses digital space to solve cases. Defense organizations of countries using cyber space to anticipate and to act proactively.

- Protection aganist digital crimes

As internet is the key to all the matters, irrespective of private or public space, using it responsively has become a big question and regulating the use of it for the government. To deal with such issues the requirement of cyber laws has come into place. The traditional laws are all related with happening of events in the physical forms but cyber laws are very unique as these laws are applicable only for digital space, that is the law governing computers and the internet. Thus, cyber law can be described as the branch of law that deals with legal issues related to use of inter-networked information technology.

4.1.2 Cyber Law

"Cyber" is a prefix used to describe a person, thing, or idea as part of the computer and information age. Taken from kybernetes, a Greek word for "steersman" or "governor," it was first used in cybernetics, a word coined by Norbert Wiener and his

colleagues. The virtual world of the internet is known as cyberspace and the laws governing this area are known as Cyber laws and all the netizens of this space come under the ambit of these laws as they carry a kind of universal jurisdiction. Cyber law can also be described as that branch of law that deals with legal issues related to the use of inter-networked information technology. In short, cyber law is the law governing computers and the internet. The growth of Electronic Commerce has propelled the need for vibrant and effective regulatory mechanisms which would further strengthen the legal infrastructure, so crucial to the success of Electronic Commerce. All these regulatory mechanisms and legal infrastructures come within the domain of Cyberlaw. Cyber law is important because it touches almost all aspects of transactions and activities on and involving the Internet, the World Wide Web, and cyberspace. Every action and reaction in cyberspace have some legal and cyber legal perspectives. Cyber law encompasses laws relating to –

- Evolution of cyber law

- Cybercrimes
- Electronic and digital signatures
- Intellectual property
- Data protection and privacy

Cyber law is important because it touches almost all aspects of transactions and activities on and involving the internet, World Wide Web and cyberspace. Every action and reaction in cyberspace have some legal perspectives. To understand the cyber laws appropriately, first we need to understand the history and growth of internet and World Wide Web.

- Pervasiveness

4.1.3 History of The Internet And World Wide Web

The Internet is a universal system of interrelated computer networks that use the uniform Internet Protocol Suite (TCP/IP) address which is unique to each network and system. It is a network of networks that consists of millions of networks of regional, national and global scope that are linked by copper wires, fiber-optic cables, wireless connections, and other technologies.

- Network of net work

The Internet carries a vast collection of information resources and services, particularly the inter-linked hypertext documents of the World Wide Web (WWW) and the structure to sustenance electronic mail, in addition to popular services such as online chat, file transfer and file sharing, online gam-

- Collects Information

ing, and Voice over Internet Protocol (VoIP) person-to-person communication via voice and video.

The origins of it can be traced back to the 1960s when the United States funded research projects (National Science Foundation) of its military agencies to build robust, fault-tolerant and distributed computer networks. This new networking technologies led to the commercialisation of an international network in the mid-1990s, and has resulted in massive change to look into the world from a very novel and different prospective. This has changed entirely the development pace of human race.

- Commercialisation of internet

The cyber laws look for the hyperlinks and Uniform Resource Locator (URLs) to understand it well.

4.1.4 Cyber Law In India

In India, cyber laws are contained in the Information Technology Act, 2000 ("IT Act") which came into force on October 17, 2000. The main purpose of the Act is to provide legal recognition to electronic commerce and to facilitate filing of electronic records with the Government.

- Legal Recognition to E-commerce

The following Act, Rules and Regulations are covered under cyber laws:

i. Information Technology Act, 2000
ii. Information Technology (Certifying Authorities) Rules, 2000
iii. Information Technology (Security Procedure) Rules, 2004
iv. Information Technology (Certifying Authority) Regulations, 2001

4.1.5 Need for Cyber Law

Firstly, India has an extremely detailed and well-defined legal system in place. Numerous laws have been enacted and implemented and the foremost amongst them is the Constitution of India. We have inter alia, amongst others, the Indian Penal Code, the Indian Evidence Act 1872, the Banker's Book Evidence Act, 1891 and the Reserve Bank of India Act, 1934, the Companies Act, and so on. However, the arrival of Internet signaled the beginning of the rise of new and complex legal issues. It may be pertinent to mention that all the existing laws in place in India were enacted way back keeping in mind the relevant political, social, economic, and cultural scenario of that relevant time. Nobody then could visualize about the Internet. Despite the brilliant acumen of our master draftsmen, the requirements of cyberspace could hardly ever be anticipated. As such, the coming of the In-

- Cyber Environment

ternet led to the emergence of numerous ticklish legal issues and problems which necessitated the enactment of cyber laws.

Secondly, the existing laws of India, even with the most benevolent and liberal interpretation, could not be interpreted in the light of the emerging cyberspace to include all aspects relating to different activities in cyberspace. In fact, the practical experience and the wisdom of judgment found that it shall not be without major perils and pitfalls, if the existing laws were to be interpreted in the scenario of emerging cyberspace, without enacting new cyber laws. Hence, the need for enactment of relevant cyber laws.

- All aspects connected to cyber space

Thirdly, none of the existing laws gave any legal validity or sanction to the activities in cyberspace. For example, the net is used by a large majority of users for email. Email was not "legal" in our country. There is no law in the country, which gives legal validity, and sanction to email. Courts and judiciary in our country have been reluctant to grant judicial recognition to the legality of email in the absence of any specific law having been enacted by the Parliament. As such the need has arisen for cyber law.

- Judicial Recognition

Fourthly, Internet requires an enabling and supportive legal infrastructure in tune with the times. This legal infrastructure can only be given by the enactment of the relevant cyber laws as the traditional laws have failed to grant the same. E-commerce, the biggest future of internet, can only be possible if necessary legal infrastructure compliments the same to enable its vibrant growth.

- Require legal Infrastructure

All these and other varied considerations created a conducive atmosphere for the need for enacting relevant cyber laws in India.

4.1.6 History of Cyber Law in India

The Information Technology Act is an outcome of the resolution dated 30 January 1997 of the General Assembly of the United Nations, which adopted the Model Law on Electronic Commerce, adopted the Model Law on Electronic Commerce on International Trade Law. This resolution recommended, inter alia, that all states give favourable consideration to the said Model Law while revising and enacting new law, so that uniformity may be observed in the laws, of the various cyber-nations, applicable to alternatives to paper-based methods of communication and storage of information.

- Model Law on Electronic Commerce

The Department of Electronics (DoE) in July 1998 drafted the bill. However, it could only be introduced in the House on

December 16, 1999 (after a gap of almost one and a half years) when the new IT Ministry was formed. It underwent substantial alteration, with the Commerce Ministry making suggestions related to E-commerce and matters about World Trade Organization (WTO) obligations. The Ministry of Law and Company Affairs then vetted this joint draft. After its introduction in the House, the bill was referred to the 42-member Parliamentary Standing Committee following demands from the Members. The Standing Committee made several suggestions to be incorporated into the bill. However, only those suggestions that were approved by the Ministry of Information Technology were incorporated. One of the suggestions that was highly debated was that a cyber café owner must maintain a register to record the names and addresses of all people visiting his café and also a list of the websites that they surfed. This suggestion was made as an attempt to curb cybercrime and to facilitate the speedy locating of a cyber-criminal. However, at the same time, it was ridiculed, as it would invade a net surfer's privacy and would not be economically viable. Finally, this suggestion was dropped by the IT Ministry in its final draft.

- Suggestion to the cyber laws

The Union Cabinet approved the bill on May 13, 2000, and on May 17, 2000, both houses of the Indian Parliament passed the Information Technology Bill. The Bill received the assent of the President on 9 June 2000 and came to be known as the Information Technology Act, of 2000. The Act came into force on 17 October 2000. With time, as technology developed further and new methods of committing a crime using the Internet & and computers surfaced, the need was felt to amend the IT Act of 2000 to insert new kinds of cyber offences and plug in other loopholes that posed hurdles in the effective enforcement of the IT Act, 2000. This led to the passage of the Information Technology (Amendment) Act, 2008 which was made effective from 27 October 2009. The IT (Amendment) Act, 2008 has brought marked changes in the IT Act, 2000 on several counts.

- IT Act 2000

4.1.7 Scope of Cyber Law

Cyber law is associated with all the areas of business which have a technological bend. In this unit, we will look at six major areas of concern for the cyber laws. The following are the areas to look for in details-

a) Electronic Commerce /E-commerce

b) Online contracts/ Electronic Contracts

c) Electronic Governance/ e-governance, and

d) Electronic taxation/ e-taxation

e) Cybercrimes

4.1.7.1 E-commerce

- Trading through electronic media

Electronic commerce, commonly known as E-commerce or e-comm, is the buying and selling of products or services over electronic systems such as the Internet and other computer networks. Electronic commerce draws on the Internet and other computer networks. It draws on such technologies as electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), Inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web (www) at least at one point in the transaction's life-cycle, although it may encompass a wider range of technologies such as e-mail, mobile devices, and telephones as well.

- Scope of E-commerce

Contemporary electronic commerce involves everything from ordering "digital" content for immediate online consumption to ordering conventional goods and services, to "meta" services to facilitate other types of electronic commerce. On the institutional level, big corporations and financial institutions use the Internet to exchange financial data to facilitate domestic and international business. Data integrity and security are very hot and pressing issues for electronic commerce.

E-commerce can be divided into:

- E-tailing or "virtual storefronts" on Web sites with online catalogs, sometimes gathered into a "virtual mall".
- The gathering and use of demographic data through Web contacts.
- Electronic Data Interchange (EDI) is the business-to-business exchange of data.
- E-mail and fax and their use as media for reaching prospects and established customers (for example, with newsletters).
- Business-to-business buying and selling.
- The security of business transactions

4.1.7.2 Electronic Contracts

E-Contracts are conceptually very similar to the traditional paper-based Commercial Contracts. Electronic contracts (contracts that are not paper based but rather in electronic form) are born out of the need for speed, convenience and efficiency. In the electronic age, the whole transaction can be

- Electronic form of contract

completed in seconds, with both parties simply affixing their digital signatures to an electronic copy of the contract. There is no need for delayed couriers and additional travelling costs in such a scenario. The conventional law relating to contracts i.e. The Indian Contract Act of 1872 is not sufficient to address all the issues that arise in electronic contracts. The Information Technology Act solves some of the peculiar issues that arise in the formation and authentication of electronic contracts.

An e-contract is a contract modeled, executed, and enacted by a software system. Computer programs are used to automate business processes that govern e-contracts.

Like any other contract, an e-contract also requires the following –

- Essential elements of an e-contract

- Offer to be made – The offer is not made by the website displaying the items for sale at a particular price. This is an invitation to offer and hence is revocable at any time up to the time of acceptance. The offer is made by the customer on placing the products in the virtual 'basket' or 'shopping cart' for payment.
- Offer to be accepted – The acceptance is usually undertaken by the business after the offer has been made by the consumer about the invitation to offer. Offers and acceptances can be exchanged entirely by e-mail; the seller can offer goods or services (e.g. air tickets, software, etc) through his website; users may need to accept an online agreement to be able to avail of the services.
- Lawful consideration – Contract to be enforceable by law must have lawful consideration, i.e., when both parties give and receive something in return.
- Intention to create legal relations
- Parties must be competent to contract
- There must be free and genuine consent
- Object of the contract must be lawful
- There must be certainty and possibility of performance

- Legal recognition to e-contract

Unit 2 of the Information Technology Act, 2000, i.e. sections 11, 12, and 13 covers the aspects of Attribution, Acknowledgment, and Despatch of Electronic Records.

According to Sec.10A of the IT Act, 2000, a communication or contract shouldn't be denied or declared void merely because it's in electronic form. It thereby acknowledges the legal validity of e-contracts.

4.1.7.3 Electronic Governance

- Processing data immediately

e-Governance (Electronic Governance) is associated with carrying out the functions and achieving the results of governance through the utilization of ICT (Information and Communications Technology). ICT facilitates efficient storing and retrieval of data, instantaneous transmission of information, processing of information and data faster than the earlier manual systems, speeding up governmental processes, taking decisions expeditiously and judiciously, increasing transparency, and enforcing accountability. It also helps in increasing the reach of government – both geographically and demographically.

Benefits of e-Governance include:

i. **Better access to information and quality services for citizens**: ICT makes available timely and reliable information on various aspects of governance.

ii. **Simplicity, efficiency, and accountability in the government**: Application of ICT to governance combined with detailed business process reengineering leads to simplification of complicated processes, weeding out of redundant processes, simplification in structures, and changes in statutes and regulations. The result is a simplification of the functioning of government, enhanced decision-making abilities, and increased efficiency across government – all contributing to an overall environment of more accountable government machinery. This, in turn, would result in enhanced productivity and efficiency in all sectors.

iii. **Expanded reach of governance**: Rapid growth of communications technology and its adoption in governance helps in bringing government machinery to the doorsteps of the citizens. Expansion of the telephone network, rapid strides in mobile telephony, the spread of the internet, and the strengthening of other communications infrastructure facilitate the delivery of a large number of services provided by the government.

Some of the major initiatives related to public service delivery are as follows:

- **Common Services Centres** – CSCs are offering government and business services in digital mode in rural areas through Village Level Entrepreneurs (VLEs). Over 400 digital services are being offered by these CSCs. So far, 5.31 Lakh CSCs are functional (including urban & rural areas) across the country, out of which, 4.20 Lakh CSCs

are functional at the Gram Panchayat level.

- **Unified Mobile Application for New-age Governance (UMANG)** – for providing government services to citizens through mobile. More than 1,570 government services and over 22,000 bill payment services are made available at UMANG.

- **e-District Mission Mode Project (MMP):** e-District project has been implemented at district and sub-district levels of all States/UTs, benefitting all citizens by delivering various e-Services, such as Certificates (Birth, Caste, Death, Income, and Local Resident), Pension (Old Age, Disability and Widow), Electoral, Consumer Court, Revenue Court, Land Record and services of various departments such as Commercial Tax, Agriculture, Labour, Employment Training & Skill Development, etc. Presently, 4,671 e-services have been launched in 709 districts across India.

- **Digi Locker:** It facilitates the paperless availability of public documents. Digital Locker has more than 11.7 crore users and more than 532 crore documents are made available through Digi Locker from 2,167 issuer organisations.

- **Unified Payment Interface (UPI)** is the leading digital payment platform. It is integrated with 330 banks and facilitated over 586 crore monthly transactions worth over ₹10 lakh crore has been facilitated for the month of June 2022.

- **CO-WIN -** It is an open platform for the management of registration, appointment scheduling and managing vaccination certificates for COVID-19. More than 203 crore vaccination doses and 110 crore registrations have been facilitated by co-win.

- **MyGov –** It is a citizen engagement platform that is developed to facilitate participatory governance. More than 2.48 crore users are actively using MyGov.

- **MeriPehchaan –** A National Single Sign-on platform called MeriPehchaan was launched in July 2022 to facilitate/provide citizens ease of access to government portals.

- **MyScheme –** This platform has been launched in July 2022 to facilitate citizens to avail of eligibility-based services.

- **Direct Benefit Transfers –** 315 Schemes across 53 Ministries are offering Aadhaar-enabled direct benefit transfers to citizens. So far, ₹24.3 lakh crore has been disbursed through the DBT platform.

- **Diksha** – Diksha is a national-level educational platform that helps students and teachers to participate, contribute, and leverage a common platform to achieve learning goals at scale for the country. As of 27 July 2022, 7,633 courses are available and more than 15 crore enrolments have been done.

The Government has taken the following steps in the direc tion of data governance for socio-economic development in the country. The brief details are as follows:

- **Open Government Data** – To facilitate data sharing and promote innovation over non-personal data, the Open Government Data platform has been developed. More than 5.65 lakh datasets across 12,800+ catalogs are published. The platform has facilitated 93.5 lakh downloads.
- **API Setu –** To facilitate data exchange among the system, API Setu has been developed as a platform. The platform has more than 2100 APIs and 1000+ user organizations.
- **MeitY** has prepared the draft National Data Governance Framework Policy which aims to realize the full potential of India's digital government vision, maximize the efficiency of data-led governance and public service delivery, and catalyse data-based research and innovation. Currently, the draft policy is under finalization. MeitY released the Draft National Data Governance Framework Policy on 26 May 2022 for public consultation.

The Government has already taken necessary measures to tackle challenges to data privacy and data security through administering the Information Technology (IT) Act, 2000 which has necessary provisions for data privacy and data security.

4.1.7.4 Electronic Taxation

The Internet over time has brought changes in many of the fundamental and long-established traditional concepts of direct and indirect taxation. Governments all over the World are grappling with the various issues of taxation raised by E-commerce. This is because of lack of comprehensive understanding of:

- The communication technologies
- The complex nature of business offered through Internet business, etc.
- The modus operandi of Internet business, etc. has made the operation of tax legislation more difficult.

The Information Technology Act of 2000, which is the first

- Absence of tax system in IT Act 2000

legislation to deal with E-commerce is quite silent about the tax system. A substantial amount of state revenue which is generated through direct and indirect taxes is lost when Internet transactions remain untaxed. A way is to be found to tackle this relevant problem.

The well-planned tax system in India with the authority to levy taxes is divided between the Central and State Governments.

- Central Government collects direct taxes like personal income tax and corporate tax.
- State Governments collect local and state sales tax.

- Principle of neutrality

In India, tax policies should be carefully formulated based on a policy that is clear, transparent, and consistent with the international norm of characterisation of revenues. The Government should honour the principle of neutrality as laid down by the OECD in characterisation of income from E-commerce transactions.The E-commerce transaction in India have been subject to taxation in two main ways:

i. Indirect taxes like VAT(Value Added Tax) have applied E-commerce transaction since their inception. The specific tax rate varies depending on the product category.
ii. A digital tax called the Equalization Levy [EL] was introduced in 2016. It applies to non-resident E-commerce operators (those without a permanent establishment in India) at a 2% rate on the consideration they receive from online sales in India.
iii. Goods and Services Tax(GST) implemented in 2017,GST applies to all E-commerce transactions (domestic and foriegn) levied at the point of the consuption.The responsibility to collect and deposit GST lies with the E-commerce market place for certain supplies.

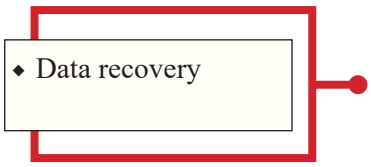
4.1.8 Computer Forensic

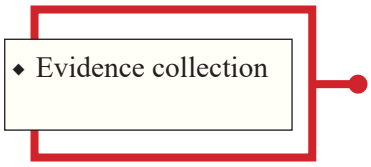
- Through Analysis of data in a computer

Computer forensics, also referred to as computer forensic analysis, electronic discovery, electronic evidence discovery, digital discovery, data recovery, data discovery, computer analysis, and computer examination, is the process of methodically examining computer media (hard disks, diskettes, tapes, etc.) for evidence. A thorough analysis by a skilled examiner can result in the reconstruction of the activities of a computer user.

(or)

In other words, computer forensics is the collection, pres-





ervation, analysis, and presentation of computer-related evidence. Computer evidence can be useful in criminal cases, civil disputes, and human resources/employment proceedings.

4.1.8.1 Uses of Computer Forensic

i. **Use of Computer Forensics in Law Enforcement: -** If there is a computer on the premises of a crime scene, the chances are very good that there is valuable evidence on that computer. If the computer and its contents are examined by anyone other than a trained and experienced computer forensics specialist, the usefulness and credibility of that evidence will be tainted.

ii. **Choosing a Computer Forensics Specialist for a Criminal Case:** When you require the services of a computer forensics specialist, don't be afraid to shop around. There are an increasing number of people who claim to be experts in the field. Look very carefully at the level of experience of the individuals involved. There is far more to proper computer forensic analysis than the ability to retrieve data, especially when a criminal case is involved. The bottom line is that you will be retaining the services of an individual who will likely be called to testify in court to explain what he or she did to the computer and its data.The court will want to know that individual's level of training and experience, not the experience of his or her employer. Make sure you find someone who not only has the expertise and experience but also the ability to stand up to the scrutiny and pressure of cross-examination.

iii. **Computer Forensics Assistance to Human Resources/ Employment Proceedings:** Computer forensics analysis is becoming increasingly useful to businesses. Computers can contain evidence in many types of human resources proceedings, including sexual harassment suits, allegations of discrimination, and wrongful termination claims. Evidence can be found in electronic mail systems, on network servers, and on individual employee's computers. However, due to the ease with which computer data can be manipulated, if the search and analysis is not performed by a trained computer forensics specialist, it could likely be thrown out of court.

iv. **Employer Safeguard Program:** As computers become more prevalent in businesses, employers must safeguard critical business information. An unfortunate concern to-

day is the possibility that data could be damaged, destroyed, or misappropriated by a discontented individual.Whether you are looking for evidence in a criminal prosecution or civil suit or determining exactly what an employee has been up to, you should be equipped to find and interpret the clues that have been left behind. This includes situations where files have been deleted, disks have been reformatted, or other steps have been taken to conceal or destroy the evidence. For example, you can find out:

- What Web sites have been visited
- What files have been downloaded
- When files were last accessed
- Of attempts to conceal or destroy evidence
- Of attempts to fabricate evidence

4.1.8.2 Computer Forensics Services:

- Identifies the complex evidences

Computer forensics professionals do more than turn on a computer, make a directory listing, and search through files. Your forensics professionals should be able to successfully perform complex evidence recovery procedures with the skill and expertise that lend credibility to your case.

For example, they should be able to perform the following services:

- Data seizure
- Data duplication and preservation
- Data recovery
- Document searches
- Media conversion
- Expert witness services
- Computer evidence service options
- Other miscellaneous services

Data Seizure: - Federal rules of civil procedure let a party or their representative inspect and copy designated documents or data compilations that may contain evidence. Computer forensics experts, following federal guidelines, should act as this representative, using their knowledge of data storage technologies to track down evidence.

Data Duplication and Preservation: - Once seized, digital evidences is often duplicated to create a working copy for analysis. This is crucial to preserve the orginal evidences in its unattered state and prevent accidential modification or loss during the investigation.

Data Recovery: - Computer forensics experts should be able to safely recover and analyze otherwise inaccessible evidence. The ability to recover lost evidence is made possible by the expert's advanced understanding of storage technologies.

Document Searches: -It involve locating and collecting specific electronic documents from a seized device. Computer forensics experts should also be able to search over 200,000 electronic documents in seconds rather than hours. The speed and efficiency of these searches make the discovery process less complicated and less intrusive to all parties involved.

Media Conversion: - It involves converting seized data from one fomat to another to enable analysis or presentation in court. This may be necessary if the data is stored in a proprielary format or needs to be viewed on specific platform.

Expert Witness Services: - Computer forensics experts should be able to explain complex technical processes in an easy-to-understand fashion. This should help judges and juries comprehend how computer evidence is found, what it consists of, and how it is relevant to a specific situation.

4.1.8.3 Who can use Computer Forensic Evidence?

i. Prosecutors use computer evidence in a variety of crimes where incriminating documents can be found, including homicides, financial fraud, drug and embezzlement record-keeping, and child pornography.
ii. Civil litigations can readily make use of personal and business records found on computer systems that bear on fraud, divorce, discrimination, and harassment cases.
iii. Insurance companies may be able to mitigate costs by using discovered computer evidence of possible fraud in accident, arson, and workman's compensation cases.
iv. Corporations often hire computer forensics specialists to find evidence relating to sexual harassment, embezzlement, and theft or misappropriation of trade secrets, and other internal and confidential information.
v. Law enforcement officials frequently require assistance in pre-search warrant preparations and post-seizure handling of the computer equipment.
vi. Individuals sometimes hire computer forensics special-

ists in support of possible claims of wrongful termination, sexual harassment, or age discrimination.

4.1.8.4 Types Of Computer Forensics

- Systematical investigation

Computer forensics involves performing a structured investigation while maintaining a documented chain of evidence to seek out exactly what happened on a computer and who was answerable for it.

i. **Disk Forensics**: It deals with extracting data from the primary or auxiliary storage of the device by searching active, modified, or deleted files.
ii. **Network Forensics**: It's a sub-branch of Computer Forensics that involves monitoring and analysing the system's network traffic.
iii. **Database Forensics**: It deals with the study and examination of databases and their related metadata.
iv. **Malware Forensics**: It deals with the identification of suspicious code and studying viruses, worms, etc.
v. **Email Forensics**: It deals with emails and their recovery and analysis, including deleted Emails, calendars, and contacts.
vi. **Memory Forensics**: Deals with collecting data from system memory (system registers, cache, RAM) in raw form and then analysing it for further investigation.
vii. **Mobile Phone Forensics**: It mainly deals with the examination and analysis of phones and smartphones and helps to retrieve contacts, call logs, incoming, and outgoing SMS, etc. and other data present in it.

4.1.9 Investigation Process

- Types of crimes

When conducting public computer investigations, you need to understand city, county, state, and federal or national crime laws related to computers, considering standard legal processes and the way to make a criminal case. In the case of criminal cases, the suspect is tried for a criminal offense, like burglary, murder, molestation, or fraud. To work out whether there was a computer crime, an investigator asks some set of questions like the following: What was the tool accustomed to committing the crime? Was it a straightforward trespass? Was it a theft, a burglary, or vandalism? Did the perpetrator infringe on someone else's rights by cyber stalking or e-mail harassment? Computers are involved in many serious crimes. the foremost notorious are those involving the sexual exploitation of minors. Digital

images are stored on hard disks, Zip disks, floppy disks, USB drives, removable hard drives, and other storage media and circulated on the net. Other computer crimes concern missing children and adults because information about missing people is commonly found on computers. Drug dealers often keep information about transactions on their computers or personal digital assistants (PDAs).

This information is very useful because it helps enforcement officers convict the person they arrested and locate drug suppliers and other dealers. Additionally, digital photos, deleted e-mail and other evidence stored on a computer can help to solve a case.An investigator can track digital activity to attach it for cyber communications and can consider digitally stored information as physical evidence of criminal activity; computer forensics also allows investigators to uncover premeditated criminal intent and should aid in the prevention of future cybercrimes.

- Tracking cyber evidence

There are five critical steps in computer forensics, all of which contribute to an intensive and revealing investigation as follows:

i. Policy and Procedure Development
ii. Evidence Assessment
iii. Evidence Acquisition
iv. Evidence Examination
v. Documenting and Reporting

Policy and Procedure Development: If it's related to malicious cyber activity, the digital evidence is always delicate and sensitive. Cybersecurity professionals understand the value of this information and respect the undeniable fact that it is often easily compromised if not properly handled and guarded. For this reason, it's critical to determine and follow strict guidelines and procedures for activities associated with computer forensic investigations. Such procedures can include detailed instructions about when computer forensics investigators are authorized to recover potential digital evidence, the way to properly prepare systems for evidence retrieval, where to store any retrieved evidence, and the way to document these activities to assist make sure the authenticity of the info.

- Plan for collecting evidences

Evidence Assessment: To effectively investigate potential evidence, procedures must be in situ for retrieving, copying, and storing evidence within appropriate databases. Investigators typically examine data from designated archives, employing a style of methods and approaches to analyse information and these could include utilizing analysis software to

- Determining the evidences

look at massive archives of knowledge for specific keywords or file types, further as procedures for retrieving files that are recently deleted. Data tagged with times and dates is especially useful to investigators, as are suspicious files or programs that are encrypted or intentionally hidden. This may also add reverse order, as file names usually indicate the directory that houses them. Files located online or on other systems often point to the particular server and computer from which they were uploaded, providing investigators with clues on where the system is located; matching online filenames to a directory on a suspect's disc drive is a method of verifying digital evidence. At this stage, computer forensic investigators add close collaboration with criminal investigators, lawyers, and other qualified personnel to confirm an intensive understanding of the nuances of the case, permissible investigative actions, and what sorts of information can function as evidence.

- Legal acquiring of evidence.

Evidence Acquisition: Perhaps the foremost critical facet of successful computer forensic investigation could be a rigorous, detailed plan for acquiring evidence. Extensive documentation is required before, during, and after the acquisition process; detailed information must be recorded and preserved, including all hardware and software specifications, any systems employed in the investigation process, and therefore the systems being investigated. This step is where policies associated with preserving the integrity of potential evidence are most applicable. General guidelines for preserving evidence include the physical removal of such storage devices, to retrieve sensitive data and ensure functionality, and taking appropriate steps to repeat and transfer evidence to the investigator's system. Acquiring evidence must be accomplished in a manner both deliberate and legal.

Evidence Examination: To investigate potential evidence, procedures must be in place for retrieving, copying, and storing evidence within appropriate databases. Investigators typically examine data from designated archives, employing a form of methods and approaches to research information; these could include utilizing analysis software to travel looking massive archives of data for specific keywords or file types, additionally as procedures for retrieving files that are recently deleted. When the data is tagged with times and dates it is very useful to investigators, as sometimes suspicious files or programs are encrypted or intentionally hidden. This might also add reverse order, as file names usually indicate the directory that houses them. Files located online or on other systems often point to the actual server and computer from which they were uploaded, providing investigators with clues on where the system is located; matching online filenames to a directory on a suspect's drive

- Check the authenticity of the evidence

may be a technique of verifying digital evidence. At this stage, computer forensic investigators add close collaboration with criminal investigators, lawyers, and other qualified personnel to substantiate a radical understanding of the nuances of the case, permissible investigative actions, and what varieties of information can function as evidence.

- Recording of the procedure for further clarifications

Documenting and Reporting: In addition to totally documenting information associated with hardware and software specs, computer forensic investigators must keep an accurate record of all activity associated with the investigation, including all methods used for testing system functionality and retrieving, copying, and storing data, additionally as all actions taken to accumulate, examine and assess evidence. It also ensures proper policies and procedures are adhered to by all parties. Because the purpose of the whole process is to accumulate data that may be presented as evidence in a court of law, an investigator's failure to accurately document his or her process could compromise the validity of that evidence and ultimately, the case itself. For computer forensic investigators, selected case should be accounted for in an exceedingly digital format and saved in properly designated archives. This helps in the authenticity of any findings by allowing these cybersecurity experts to indicate exactly when, where, and the way evidence was recovered. It also gives the information about the evidence by matching the investigator's digitally recorded documentation to dates and times when this data was accessed by potential suspects via external sources.

Summarised Overview

The inter connected field of cyber law, cyber crime and cyber forensics address the legal and investigate aspects of the digital world. Cyber law establishes legal frame work for online activities while cyber crime encompasses illegal activities conducted through computer and networks. Cyber forensics, the scientific field of investigating and analysing digital evidence, plays a crucial role in cyber crime investigations and legal proceedings, by collecting, preserving and analysing electronic data to reconstruct events, identify preperators, and gather admissible evidence.

Self-Assessment Questions

1. What do you mean by Cyberspace?
2. How can one identify the cybercrimes?
3. Briefly explain the term privacy risk management
4. Define firewall system?
5. What are the stages of investigation process?
6. What is cyber forensic?
7. What is Trojan horse?

Assignments

1. Describe the process of Firewall with examples
2. What do you mean by investigation? Explain each stage in detail
3. Explain the cyber forensics in the recent business scenario
4. Explain the evolution of IT Act 2000
5. What are the different types of cyber crimes?
6. What is cyber defamation?

Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

Unit 2

IT Act

Learning Outcomes

After completing this unit, the learner will be able to:

- analyse Information Technology Act, 2000 of India and its implications
- discuss Laws that govern electronic commerce activities
- identify Laws that govern the use of Intellectual property.

Background

The Information Technology Act,2000(IT Act) is a landmark legislation in India that established the legal frame work for electronic transactions, digital signature, and cyber crime. It aimed to promote electronic commerce and facilitate the use of electronic records and signatures in government and other sectors. The IT Act also amended existing Laws like the Indian Penal Code(IPC) and the Indian Evidence Act (IEA) to make them applicable to the digital realm and address cyber crimes effectively.

Keywords

IT Act 2000, Implication of IT Act 2000

Discussion

4.2.1 Information Technology Act, 2000

- First cyber law

The parliament of India passed its first Cyber Law on the 17th October 2000, the Information Technology (IT) Act, 2000 which provides the legal infrastructure for E-commerce in India. The purpose of the IT Act, 2000, as mentioned in the language of the Act, is:

- Collaboration with Other Law

To provide legal recognition for transactions carried out using electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce" which involves the use of alternative to paper-based methods of communication and storage of information, to facilitate electronic filing of documents with the Government agencies and further to amend the Indian Penal Code, the Indian Evidence Act, 1872, the Banker's Book Evidence Act, 1891 and the Reserve Bank of India Act, 1934 and for matters connected therewith or incidental thereto.

- Uniformity of law

By its resolution A/RES/51/162 dated 30th January, 1997, has adopted the Model Law on Electronic Commerce adopted by the United Nations Commission on International Trade Law. The same resolution recommends inter alia that all States give favourable consideration to this Model Law when they enact or revise their laws, keeping in mind the need for uniformity of law pertaining to alternatives to paper-based methods of communication and storage of information. The Indian Information Technology Act, 2000, accordingly draws upon the Model Law.

- New legalised Business Transaction

The implementation of this Act has kickstarted a new era of e-governance and will have a lot of impact on the way people do business in India and will also open up new opportunities for e-business, as people would be less apprehensive about the legal hassles and issue not under the jurisdiction of law, e.g., authenticity of digital documents, hacking, digital signatures, and so on.

Therefore, it is essential for us to understand the IT Act, 2000 offers and what its various perspectives are.

4.2.2 Highlights of the IT Act, 2000

For a basic understanding of the IT Act for the layman, the salient features of the Act and its relevant portions to E-business are stated as:

- Electronic contracts are legally valid-EDI accorded legal recognition.
- Legal recognition accorded to digital signatures.
- Digital Signature to be affected by use of asymmetric crypto system and hash function.
- Security procedure for electronic records and digital signature.
- Appointment of Certifying Authoritie (CAs) and Control-

ler of Certifying Authorities (CCA) including recognition of foreign Certifying Authorities.

- Controller to be appointed who will act as repository of all digital signature certificates.
- Certifying Authorities require to get license to issue digital signature certificates.
- Various types of computer crimes defined and stringent penalties provided under the Act.
- Appointment of Adjudicating Officer for holding inquires under the Act.
- Establishment of Cyber Appellate Tribunal to High Court.
- Act to apply for offenses or contraventions committed outside India.
- Network service providers not to be liable in certain cases.
- Power of Police officers and other officers to enter into any public place and search and arrest without warrant.
- Constitution of Cyber Regulations Advisory Committee to advice the Central Government and Controller.
- Amendment effected in:
    - Indian Penal Code
    - Indian Evidence Act
    - Reserve Bank of India Act

4.2.3 Important Concepts Introduced in the IT Act, 2000

Some of the important concepts introduced in the IT Act, 2000 are:

- Electronic record
- Secure electronic record
- Digital signature
- Secure digital signature
- Certifying authority
- Digital signature certificate

The concept of electronic record, as envisaged by the Act has already been described. A secure electronic record has been

defined in the Act as follows:

Where any security procedure has been applied to an electronic record at a specific point of time, then such record shall be deemed to be a secure electronic record from such point of time to the time of verification. The security procedures envisaged are not prescribed by the Act. The Act specifies that the Central Government shall prescribe the security procedure. Thus, in so far as the Act is concerned, the secure electronic record is a purely legal concept and not a technological concerned, the secure electronic record is a purely legal concept and not a technological one. The application of the prescribed procedure will create a presumption, in the eyes of the law, relating to the authenticity and integrity of the record. Therefore, not only must the security of the procedure be such that it indeed offers adequate security, but it must also be demonstrated that the correct procedure has been applied.

- Authenticity and Integrity

The IT Act, 2000 prescribes that electronic records are to be authenticated using affixing a digital signature. This digital signature must be affected by the use of an asymmetric crypto system and hash function. In contrast, the European Electronic Signature Standardization Initiatives (EESSD) is technology-neutral in its prescription of how an electronic signature may be affected.

- Technological awareness required

This point needs a little elaboration. Until fairly recently (about 1997) it was believed that the use of asymmetric cryptosystems would be the foundation for all electronic authentication. However, there is an increasing awareness that other technologies, such as biometrics, also offer the promise of electronic authentication. Consequently, there is greater interest in technology-neutral legislation. This type of technology-neutral specification tends to be called an electronic signature as opposed to a digital signature, which is just one type of electronic signature, as the Act put it :

- Use of biometric as electronic signature

The concept of a secure digital signature, as the Act puts it, is:

If, by application of a security procedure agreed to by the parties concerned, it can be verified that a digital signature, at the time it was affixed was

- Secured

a. Unique to the subscriber affixing it:
b. Capable of identifying such a subscriber:
c. Created in a manner or using a means under the exclusive control of the subscriber and is linked to the electronic record to which it relates in such a manner that if the electronic record was altered the digital signature would be

invalidated, then such digital signature shall be deemed to be secure digital signature.

- Legal concept

It can be seen that the concept of a secure digital signature is a purely legal concept rather than a technical one. The parties concerned must agree on a security procedure, and once it is demonstrated that the security procedure was indeed applied, then the digital signature will be deemed secure, and all the legal presumptions that stem from this consideration will then be applicable.

- Provide private key and public key

The technical requirements for effecting digital signature by use of an asymmetric cryptosystem with a hash function are a private key to effect a digital signature and a public key to verify such a signature. The private key must be kept secret, as its name implies. The public key must be made available to any individual who needs to verify a signature created with the private key. The Act stipulates that the association between a subscriber's name and his public key should be made available by a duly licensed certifying authority in the form of a digital signature certificate.

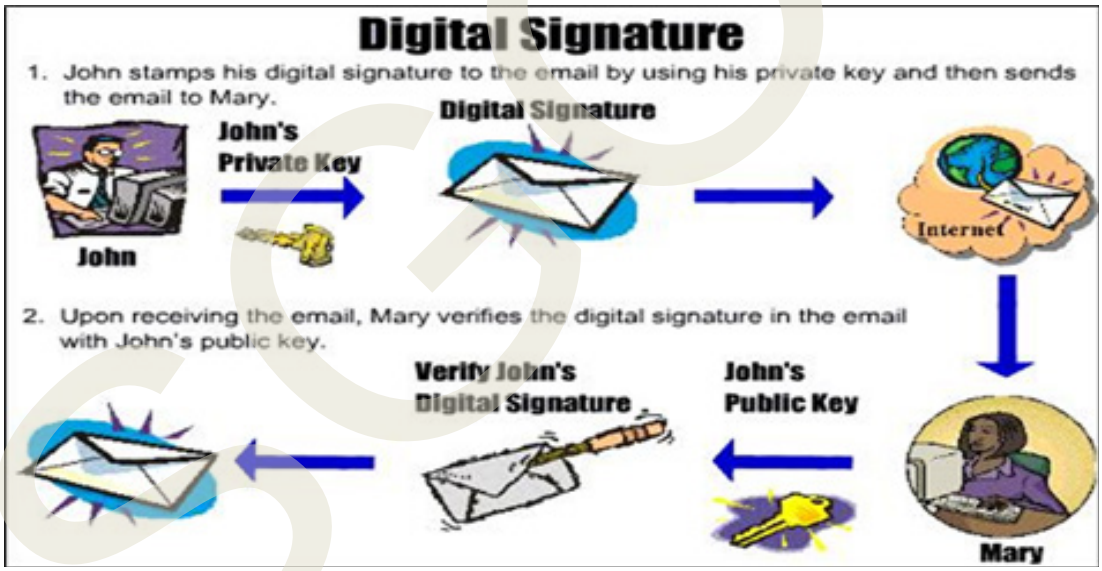

Figure:4.2.1 Digital Signature

- Controller of certifying Authority

The Act provides for a Controller of Certifying Authorities to be appointed by the central government. The functions of the Controller include the licensing and regulation of operations of organisations that may acts act as certifying authorities.

- Issue of private key

A certificate authority provides a subscriber, for a fee, a digital signature certificate and a private key. The private key is known only to the subscriber. The certificate authority is obliged to:

i. Make use of hardware, software, and procedures that are secure from intrusion and misuse.
ii. Provide a reasonable level of reliability in its services which are best suited to the performance of intended functions.
iii. Adhere to security procedures to ensure that the secrecy and privacy of the digital signature are assured.

The digital signature certificate of any subscriber is used by anyone who wishes to verify a digital signature purported to be affixed by that subscriber. Thus, the basic role of a certifying authority is to establish trust in the name-public key that is contained in the digital signature certificate.

- Trust through public key

4.2.4 Positive Aspects of The Corporate Sector

From the perspective of the corporate sector, the IT Act, of 2000 and its provisions contain the following positive aspects:

- Legal validity to e-mail

i. The implication of these provisions for the corporate sector would be that e-mail will now be a valid and legal form of the communication in our country, which can be duly produced and approved in the court of law.

- Infrastructure for E-commerce

ii. Companies shall now be able to carry out electronic commerce using the legal infrastructure provided by the Act. Till now, the growth of E-commerce was impeded in our country basically because there was no legal infrastructure to regulate commercial transactions online.

- Use of Digital Signature

iii. Corporates will now be able to use digital signature to carry out their transactions online. These digital signatures have been given legal validity and sanction in the Act.

- Open entry for certify authorities

iv. The Act also throws open the doors for the entry of corporates in the business of being certifying authorities for issuing digital signatures certificates. The Act does not make any distinction between any legal entity for being appointed as a certifying authority so long as the norms stipulated by the government have been followed.

- Transactions via electronic form

v. The Act also enables the companies to file any form, application or any other document with any office, authority, body or agency owned or controlled by the appropriate government in the electronic form as may be prescribed by the appropriate government.

vi. Corporates are mandated by different laws of the country

to keep and retain the said information in the electronic form, if the:

- Procedure for legality

1. information contained therein remains accessible so as to be usable for further reference,
2. electronic record is retained in the format in which it was originally generated, sent or received or in a format which can be demonstrated to represent accurately the information originally generated, sent or received,
3. details which will facilitate the identification of the origin, destination, date and time of dispatch or receipt of such electronic record are available in the electronic record.

vii. The IT Act also addresses the important issues of security which are so critical to the success of electronic transactions. The Act has also given a legal definition to the concept of secure digital signature which would be required to have been passed through a system of a security procedure, as stipulated by the government at a later date. In the times to come, secure digital signatures shall play a big role in the New Economy particularly from the perspective of the corporate sector as it will enable a more secure transaction online.

- Protection of Digital Signature

viii. The IT Act has defined various cyber crimes and has declared them penal offenses punishable by imprisonment and fine. These include hacking and damage to computer source code. Often, corporates face hacking into their systems and information. Till date, the corporates were in a helpless condition as there was no legal redress to such issues, but the IT Act changed the scene altogether.

- Define Cyber Crime

However, despite the overwhelming positive features of the IT Act, 2000 for the corporate sector, some more steps need to be enacted by the government in related areas.

4.2.5 Unresolved Issues In It Act, 2000

The IT Act, 2000 does not cover the following legal issues:

- Taxation Issues that arise out of E-commerce, Internet and m-commerce, and transactions.
- Intellectual Property Rights such as Digital Copyright Issues, Trade Marks, and Patent.

- Domain Name Registration Policy, Domain Name Disputes, and cybersquatting.
- Privacy and Data Protection Issues.
- Rights to e-commencers, i.e. no provision for cover under COPRA.

Applicability

- IT Act, 2000, applicable to whole of India

According to Section 1 (2), the Act extends to the entire country, which also includes Jammu and Kashmir. To include Jammu and Kashmir, the Act uses Article 253 of the Constitution. Further, it does not take citizenship into account and provides extra-territorial jurisdiction.

- Punishable irrespective of the Nationality

Section 1 (2) along with Section 75, specifies that the Act applies to any offence or contravention committed outside India as well. If the conduct of the person constituting the offense involves a computer or a computerized system or network located in India, then irrespective of his/her nationality, the person is punishable under the Act. Lack of international cooperation is the only limitation of this provision.

Non-Applicability

According to Section 1 (4) of the Information Technology Act, 2000, the Act is not applicable to the following documents:

- Execution of Negotiable Instrument under Negotiable Instruments Act, 1881, except cheques.
- Execution of a Power of Attorney under the Powers of Attorney Act, 1882.
- Creation of Trust under the Indian Trust Act, 1882.
- Execution of a Will under the Indian Succession Act, 1925 including any other testamentary disposition by whatever name called.
- Entering into a contract for the sale of conveyance of immovable property or any interest in such property.
- Any such class of documents or transactions as may be notified by the Central Government in the Gazette.

As there are various laws that worked aligned with each other whenever the need arises. So thus, the IT Act with other laws. Hereafter we will discuss the other Acts and the important provisions of the same that needs to be looked into whil- registering a case under the IT Act.

4.2.6 Overview of other Laws Amended By The It Act, 2000

- Alliance with other Act

The Indian Penal Code of 1860 and the Indian Evidence Act of 1872 were amended by the IT Act of 2000 to keep in tune with the technological changes that were rising rapidly.

A. Indian Penal Code, 1860

- Indian Penal Code Sec.91

Amendments related to IPC were contained in Sec.91 and the First Schedule of the IT Act, 2000. Under the enactment of the Information Technology (Amendment) Act, 2008, Sec.91 was deleted and the provisions about the Indian Penal Code were mentioned in Part III of the amendment Act.

The amendments made to the Indian Penal Code are as follows –

- Nationality and punishment

i. Amendment to Sec.4 – In section 4, - i) after clause (2), the following clause shall be inserted namely: - (3) any person in any place without and beyond India committing offense targeting a computer resource located in India ii) for the Explanation, the following Explanation shall be substituted, namely: - (a) the word "offense" includes every act committed outside India which, if committed in India would be punishable under this code. (b) the expression "computer resource" shall have the meaning assigned to it in clause (k) of subsection (1) of section 2 of the Information Technology Act, 2000.

ii. Amendment of Sec.40 – In clause (2), after the figure "117", the figures "118,119 and 120" shall be inserted.

iii. Amendment of Sec.118 – In section 118, for the words "voluntarily conceals, by any act or illegal omission, the existence of a design", the words "voluntarily conceals by any act or omission or by the use of encryption or any other information hiding tool, the existence of a design" shall be substituted.

iv. Amendment of Sec.119 – In section 119, for the words "voluntarily conceals, by any act or illegal omission, the existence of a design", the words "voluntarily conceals by any act or omission or by the use of encryption or any other information hiding tool, the existence of a design" shall be substituted.

v. Amendment of Sec.464 – In section 464, for the words "digital signature" wherever they occur, the words "electronic signature" shall be substituted.

- Evidence Act Sec.92

Indian Evidence Act, 1872

Amendments related to the Evidence Act were contained in Sec.92 and the Second Schedule of the IT Act, 2000. Under the enactment of the Information Technology (Amendment) Act, 2008, Sec.92 was deleted and the provisions about the Indian Evidence Act were mentioned in Part IV of the amendment Act.

i. Amendment of Sec.3 – In section 3 relating to the interpretation clause, in the paragraph appearing at the end, for the words "digital signature" and "Digital Signature Certificate", the words "Electronic signature" and "Electronic Signature Certificate" shall be respectively substituted.

ii. Insertion of new Sec.45A – Opinion of Examiner of Electronic evidence – 45A: When in a proceeding, the Court has to form an opinion on any matter relating to any information transmitted or stored in any computer resource or any other electronic or digital form, the opinion of the Examiner of Electronic Evidence referred to in section 79A of the Information Technology Act, 2000, is a relevant fact. Explanation: For this section, an Examiner of Electronic Evidence shall be an expert

iii. Amendment of Sec.47A – In section 47A, - (i) for the words "digital signature", the words "electronic signature" shall be substituted; (ii) for the words "Digital Signature Certificate", the words "Electronic Signature Certificate" shall be substituted.

iv. Amendment of Sec.67A – In section 67 A, - for the words "digital signature", the words "electronic signature" shall be substituted.

v. Amendment of Sec.85A – In section 85A, for the words "digital signature", wherever they occur, the words "electronic signature" shall be substituted.

vi. Amendment of Sec.85B – In section 85B, - for the words "digital signature", wherever they occur, the words "electronic signature" shall be substituted.

vii. Amendment of Sec.85C – In section 85C, for the words "Digital Signature Certificate", the words "Electronic Signature Certificate" shall be substituted.

viii. Amendment of Sec.90A – In section 90A, the words "digital signature", at both places where they occur, the words "electronic signature" shall be substituted.

4.2.7 National Policy on Information Technology 2012

- Sustainable growth of the nation

The Union Cabinet has recently in September 2012, approved the National Policy on Information Technology 2012. The Policy aims to leverage Information & Communication Technology (ICT) to address the country's economic and developmental challenges. The vision of the Policy is "To strengthen and enhance India's position as the Global IT hub and to use IT and cyberspace as an engine for rapid, inclusive and substantial growth in the national economy". The Policy envisages among other objectives, to increase revenues of IT and ITES Industry from 100 billion USD at present to 300 billion USD by 2020 and expand exports from 69 billion USD at present to 200 billion USD by 2020. It also aims to create a pool of 10 million additional skilled manpower in ICT.

The thrust areas of the policy include:

i. To increase revenues of IT and ITES (Information Technology Enabled Services) Industry from 100 billion USD currently to 300 billion USD by 2020 and expand exports from 69 billion USD currently to 200 billion USD by 2020.
ii. To gain significant global market share in emerging technologies and Services.
iii. To promote innovation and R&D in cutting-edge technologies and development of applications and solutions in areas like localization, location-based services, mobile value-added services, Cloud Computing, social media, and Utility models.
iv. To encourage the adoption of ICTs in key economic and strategic sectors to improve their competitiveness and productivity.
v. To provide fiscal benefits to SMEs and Startups for adoption of IT in value creation
vi. To create a pool of 10 million additional skilled manpower in ICT.
vii. To make at least one individual in every household e-literate.
viii. To provide for mandatory delivery of and affordable access to all public services in electronic mode.
ix. To enhance transparency, accountability, efficiency, reliability, and decentralization in Government and in particular, in the delivery of public services.
x. To leverage ICT for key Social Sector initiatives like Ed-

ucation, Health, Rural Development, and Financial Services to promote equity and quality.

xi. To make India the global hub for the development of language technologies, to encourage and facilitate the development of content accessible in all Indian languages, and thereby help bridge the digital divide.

xii. To enable access to content and ICT applications by differently-abled people to foster inclusive development.

xiii. To leverage ICT to expand the workforce and enable life-long learning.

xiv. To strengthen the Regulatory and Security Framework for ensuring a Secure and legally compliant Cyberspace ecosystem.

xv. To adopt Open standards and promote open source and open technologies The Policy has however not yet been notified in the Official Gazette.

Summarised Overview

The Amendments to the Information Technology Act, of 2000 have been shown in revision mode with footnotes explaining the amendments. As the technologies and applications in the IT sector change very rapidly, some of the provisions related to parameters that may change from time to time have been amended to provide for the new developments to be incorporated by changes in rules/govt. notifications. This would enable the law to be amended and approved much faster and would keep our laws in line with the changing technological environment.

The Act is being made technology-neutral with minimum change in the existing IT Act 2000. This has been made by amendment of Section 4 of the Act to provide for electronic signature with digital signature as one of the types of electronic signature and by enabling the details of other forms of electronic signature to be provided in the Rules to be issued by the Central Government from time to time. This is an enabling provision for the Central Government to exercise as and when the technology other than digital signature matures. Then there will be no need to amend the Act and the issue of rules will be sufficient. Consequently, the term digital is changed to electronic in other sections.

To use IT as a tool for socio-economic development, as explained in this block, particularly to promote E-commerce, e-governance, its uses in health, and learning, creating more employment opportunities, and reducing the digital divide among others, it is necessary to encourage society to go through the learning experience.

Self-Assessment Questions

1. When was IT Act implemented in India?
2. What is the need for IT Act in India?
3. What are the Indian laws and Acts which address various aspects of cybercrimes in India?
4. What are the objectives of IT Act?
5. What are the features of IT Act?
6. In what places the IT Act is applicable?
7. In what areas the IT Act is not applicable?
8. What do you mean by electronic records?
9. What do you mean by digital signature?
10. What is Certificate Authority?
11. Differentiate beteween private key and public key in digital signature?

Assignments

1. Explain the first Schedule of the IT Act and the related provisions of the Indian Penal Code
2. Explain the second Schedule of the IT Act and the related provisions of the Indian Evidence Act, 1872.
3. Explain the third Schedule of the IT Act and the related provisions of the Bankers' Books Evidence Act.
4. What is the relevance of digital signature in business?
5. What are the important concepts explained in IT Act 2000?
6. How does the IT Act 2000 related to the IPC?

Suggested Reading

1. Bendovschi, A. (2015) *Cyber-Attacks – Trends, Patterns and Security Countermeasures.* Procedia Economics and Finance, 24-31. doi:10.1016/S2212-5671(15)01077- [2]

2. Cabaj, K., Kotulski, Z., Księżopolski, B., & Mazurczyk, W. (2018) *"Cybersecurity: trends, issues, and challenges". EURASIP* Journal on Information Security. doi:10.1186/s13635- 018-0080-0

3. Dervojeda, K., Verzijl, D., Nagtegaal, F., Lengton, M., & Rouwmaat, E. (2014) *Innovative Business Models: Supply chain finance.* Netherlands: Business Innovation Observatory; European Union. [4]

4. Gade, N. R., & Reddy, U. G. (2014) *A Study Of Cyber Security Challenges And Its Emerging Trends On Latest Technologies.* Retrieved from https://www.researchgate.net/publication/260126665_A_Study_Of_Cyber_Security_Ch alleng-es_And_Its_Emerging_Trends_On_Latest_Technologies

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1. Gross, M. L., Canetti, D., & Vashdi, D. R. (2017) *"Cyberterrorism: its effects on psychological well-being, public confidence and political attitudes".* Journal of Cybersecurity, 3(1), 49–58. doi:10.1093/cybsec/tyw018

2. Hua, J., & Bapna, S. (2013) *"The economic impact of cyber terrorism".* The Journal of Strategic Information Systems, 22(2), pp. 175-186. [7]

3. Kumar, S., & Somani, V. (2018) *"Social Media Security Risks, Cyber Threats and Risks Prevention and Mitigation Techniques".* International Journal of Advance Research in Computer Science and Management, 4(4), pp. 125-129.

4. Panchanatham, D. N. (2015) *"A case study on Cyber Security in E-Governance".* International Research Journal of Engineering and Technology. .

Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

MODEL QUESTION PAPER SETS

Set 1

MODEL QUESTION PAPER

SREENARAYANAGURU OPEN UNIVERSITY

Second Semester M. Com Degree Examination

(Core Course V)

M21CM05DC: E-BUSINESS AND CYBER LAWS

Maximum time: 3 hours **Maximum marks: 70**

SECTION A

Answer any five of the following questions in one or two sentences each. Each question carries 2 marks.

1. How is E-business different from E-cmmerce?
2. What is ERP?
3. Why is cyber security considered crucial in today's digital landscape?
4. What is cyber law?
5. Discuss the role of Artificial Intelligence in ERP systems.
6. Explain B2B transactions with an example.
7. What is cyber defamation?
8. Describe the term phishing.

(5x2=10)

SECTION B

Answer any six of the following questions in one page each. Each question carries 5 marks.

9. Cyber crime against persons committed directly influence the individual's personality". Support this statement by elucidating the different types of cyber crimesagainst a person.
10. What are the different models of E-tailing?
11. Briefly explain the National policy on Information Technology 2012.
12. Why is it crucial for businesses to establish an online presence?
13. What are the recent trends in ERP?

14. Explain how e-CRM infrastructure support the overall goals of Customer Relationship Management.

15. Elucidate the steps involved in managing cyber security risks, following the structured four-step process used by organizations?

16. As a newly appointed supply chain manager for a manufacturing company, you are tasked with optimizing the company's supply chain processes. Describe how you would implement Supply Chain Management principles within the organization, outlining each component.

17. Discuss the significance of digital signatures under the IT Act, 2000 and how they enable corporates to conduct secure transactions online.

18. Explain the concept and functions of an EPOS system.

(6x5=30)

SECTION C

Answer any two of the following questions in four pages each. Each question carries 15 marks.

19. What are cyber frauds? Explain the various types of cyber frauds found in India.

20. Explain the concept of e-procurement and its significance in streamlining the purchasing process for businesses. How does e-procurement differ from traditional e-commerce? Describe the steps involved in e-procurement

21. "Computer evidence can be useful in criminal cases, civil disputes, and human resources/employment proceedings. A thorough analysis by a skilled examiner can result in the reconstruction of the activities of a computer user." Justify the statement outlining the various types of computer forensics and their respective areas of focus.

22. What do you mean by a business model? Explain the different types of business models.

(2x15=30)

Set 2

MODEL QUESTION PAPER
SREENARAYANAGURU OPEN UNIVERSITY
Second Semester M. Com Degree Examination
(Core Course V)
M21CM05DC: E-BUSINESS AND CYBER LAWS

Maximum time: 3 hours **Maximum marks: 70**

SECTION A

Answer any five of the following questions in one or two sentences each. Each question carries 2 marks.

1. How is cyber stalking performed?
2. Explain the different forms of E-advertising?
3. What is malware?
4. Describe the term cyber vandalism.
5. What is an E-contract?
6. How does agile model differ from fast model in Supply Chain Management?
7. Compare and contrast brand value with brand equity.
8. Briefly explain the components of e-SCM.

(5x2=10)

SECTION B

Answer any six of the following questions in one page each. Each question carries 5 marks.

9. Distinguish between E-business and E-commerce.
10. Where does the Information Technology Act, 2000 apply according to Section 1(2)? Which documents or transactions are not covered by the Information Technology Act, 2000, as per Section 1(4)?
11. "The firewall is part of an overall security policy that creates a perimeter defense designed to protect the information resources of the organization." Justify the statement.

12. Imagine you are a manager tasked with optimizing the supply chain of a retail company. Outline the primary challenges you anticipate encountering in this process and propose strategies to address them effectively.
13. As a cyber security analyst, outline the stages involved in investigating cybercrimes. Discuss how each stage contributes to identifying perpetrators and mitigating the impact of cyber attacks on organisations?
14. Discuss the significance of having an effective web presence for businesses and explain the benefits that it offers to businesses.
15. Elucidate on the issues related to E-business risk management.
16. Briefly explain Indian Evidence Act 1872.
17. What are the key objectives and thrust areas outlined in the National Policy on Information Technology 2012?
18. What steps should businesses take to build CRM infrastructure, and why is it essential to create an integrated CRM vision and strategy?

(6x5=30)

SECTION C

Answer any two of the following questions in four pages each. Each question carries 15 marks.

19. What are the key steps involved in ERP implementation? How do various factors influence the successful deployment of an ERP system?
20. As a marketing manager, elucidate the concept of e-marketing and its significance in the digital age. Analyse several contemporary e-marketing strategies implemented by businesses, highlighting their effectiveness and impact on consumer engagement and brand visibility.
21. What do you mean by cyber crime? Discuss on the different types of cyber crimes prevalent in the society.
22. Discuss the significance of Intellectual Property (IP) in the context of E-business. Explain the different crimes related to IPR.

(2x15=30)

സർവ്വകലാശാലാഗീതം

വിദ്യയാൽ സ്വതന്ത്രരാകണം
വിശ്വപൗരരായി മാറണം
ഗ്രഹപ്രസാദമായ് വിളങ്ങണം
ഗുരുപ്രകാശമേ നയിക്കണേ

കൂരിരുട്ടിൽ നിന്നു ഞങ്ങളെ
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സ്നേഹദീപ്തിയായ് വിളങ്ങണം
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ബോധരശ്മിയിൽ തിളങ്ങുവാൻ
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