1. **Subject Name: E-Commerce (BBAA405SE2)**

2. **Semester / Year: Semester IV**

3. **Name of the Teacher: Pinaki Dey**

4. **Name of the topic: Technology in E-Commerce (Part I)**

6 The Internet

6.1 INTRODUCTION

The Internet is a global network that connects billions of computers all over the world. It is a network of networks. The Internet links different organizations, academic institutions, government offices, and home users to share information among a large group of users.

Each computer on the Internet is called a host. To connect to the Internet, the user must gain access through a commercial Internet service provider (ISP). The Internet, sometimes known as the Net, allows the users to perform the following functions:

- Connect easily through ordinary personal computers (PCs) and local phone numbers to share a huge pool of information.
- Exchange emails with friends and colleagues as the email service has practically replaced the postal service for short written transactions and has undoubtedly become the most widely used application on the Net.
- Converse with other users on the Net where the conversation is text-based, voice-based, video-based, or a combination of all of them.
- Share important information in a timely manner.
- Access multimedia information that includes sound, photographic images, and video.
- Browse for information on websites using a web browser. The most popular browsers are Microsoft Internet Explorer, Netscape Navigator, Opera, Google Chrome, and Mozilla Firefox.

An additional feature of the Internet is that it lacks a central controlling authority. Although there are different governing boards that work to establish policies and standards, the Internet is bound by a few rules and answers no single organization.

6.1.1 History

The roots of the Internet can be traced back to 1969 when the Advanced Research Projects Agency (ARPA) of the US government formed the first network that

was widely known as the Advanced Research Projects Agency Network (ARPANET). This network was initially created to interconnect computers so that users in research organ-izations and universities could communicate with each other and share information.

However, it was in 1989 that the US government had lifted restrictions on the use of Internet and allowed it to be used for commercial purposes as well. Since then, the Internet has grown rapidly to become the world's largest network that connects thousands of net-works, billions of computers, and hundreds of countries across the world.

6.2 INTERNET SERVICES

Today, the Internet has become a part of not only big organizations, universities, and offices but has also become the need of home users (like students) all over the world. In this era, life without the Internet has become unimaginable. Users access the Internet to avail services like email. In this section, we will read in detail about these services.

6.2.1 Electronic Mail

Electronic mail or email (Figure 6.1) refers to the means of transmission of messages elec-tronically over communication networks. These messages may vary from notes entered from the keyboard to electronic files stored on the disk. Companies that are fully computerized make extensive use of emails because it is fast, flexible, and reliable.

Email is one of the most widely used services on the Internet. Anyone with an email account can send an electronic mail (like a letter) to any other person who also has an email account (provided the email address of the recipient is known). Usually, the structure of the email can be given as *username@domain name.*

For example, if a user has created an email account on Gmail, then the email address is *username@gmail.com* where username is the Gmail screen name.
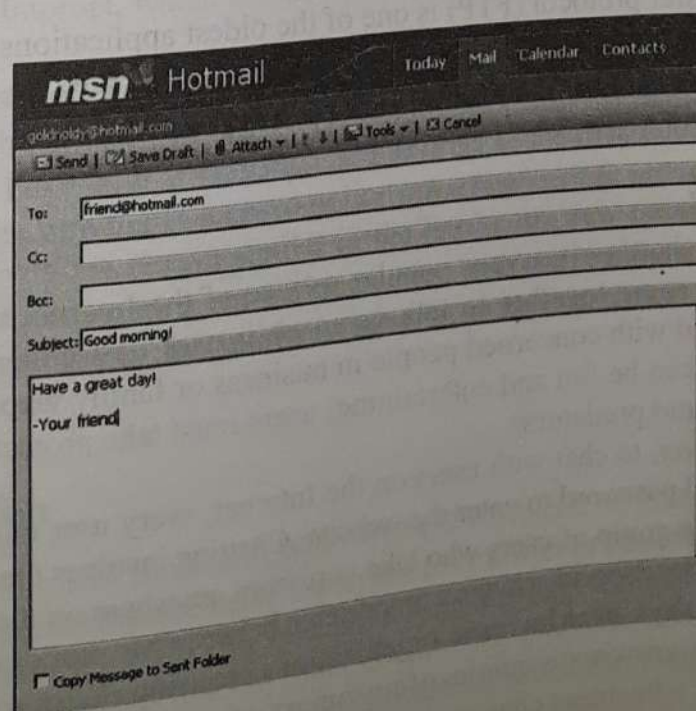

Figure 6.1 Email

Using an email is rather straightforward. If you have an email account, you can just click on the option that says something similar to Compose e-mail. Thereafter, you will be prompted to enter the following fields.

To In this field, the email address of the recipient will be written.

Subject In this field, you can type anything illustrating the content of the message. However, the length of this field is limited.

Body In this field, the content of the message is written. Most email systems include a rudimentary text editor for composing messages but users may also edit messages using any other editor of their choice.

CC and BCC Filling up these fields is optional. However, similar to the *To* field, the email address of the recipient is also entered in these. While *CC* stands for carbon copy, *BCC*, on the other hand, means blind carbon copy. When you wish to send the same email message to multiple recipients, add the extra email addresses in the *CC:* field, separating each address with a comma. BCC works just like *CC*, except that the email addresses in *BCC* are not revealed to the other recipients. For example, if you send an email *To: Goransh* and *BCC: Radhika*, then *Radhika* will see *Goransh's* email address, but *Goransh* will not see *Radhika's* email address.

Moreover, there are also options for attachments and forwards. These options enable users to add files to the email. The forward option is used to forward (make a copy) a message received from someone and mail it to someone else.

The sent messages are stored in electronic mailboxes until the recipient fetches them. After reading the message, the receiver may save it, delete it, forward it to someone else, or reply to it. On the whole, email is a good alternative to the traditional paper-based letters. It is much faster and easier to use as there is no need to buy envelopes and stamps and involves no queuing in the post office.

6.2.2 File Transfer Protocol

File transfer protocol (FTP) is one of the oldest applications of the Internet for transferring files from one computer to another like from a user's PC to a web server. FTP is discussed in more detail in section 6.7.4.

6.2.3 Chatting

Internet chatting is a very popular service of the Internet that allows two or more online users to come together to talk using an instant messenger. Chatting helps users to stay connected with concerned people in business or family who live many miles away. Though chatting can be fun and entertaining, users must take protective measures to avoid Internet stalkers and predators.

However, to chat with users on the Internet, every user must have an account with a user name and password to enter the website. Chatting involves the exchange of typed-in messages between a group of users who take part from anywhere on the Internet. The chatting program also enables users to arrange a private chat between two parties who met initially in a group chat.

Nowadays, even business organizations are using chatting services to host online business meetings, answer any queries of customers, or provide them with online support and assistance. Whether a business chat or a personal chat, it can be ongoing or scheduled for a particular

duration. Most chats are focused on a particular topic of interest and some involve guest experts or celebrities to talk to other online members who want to join the chat.

6.2.4 Internet Conferencing

The evolution of the Internet has changed the way in which business houses arrange conferences. Nowadays, organizations are increasingly switching to Internet conferencing to reduce the extra costs involved in travelling and making telephone calls, thereby resulting in better time management and enhanced productivity.

Internet conferencing is quite similar to traditional teleconferencing. The difference is that during an Internet conference call, participants will sit at their respective offices while being connected to each other through the Internet. Many Internet conferencing software allow as many as 25 online participants to participate in a web meeting.

Today, there are numerous software available on the Internet that can be easily downloaded to host a conference call at little or no cost. To start an Internet conference call, users need a computer with an Internet connection, related software, a webcam, and a microphone (to see and hear what the remote or distant participants are saying). During the conference, users can share information, files, video, and audio clips.

Internet conferencing has taken virtual meetings (because users are not present at the same place) to a new level. This service is increasingly being used to collaborate with various teams in a company to deliver presentations, to host small-scale or large-scale seminars, to connect with technical support, and so on. The advantages of Internet conferencing are multiple and aid small and established businesses alike.

6.2.5 Electronic Newspaper

An online newspaper, also known as a web newspaper or an electronic newspaper, is a newspaper on the Internet, which is either published separately or as an online version of a printed periodical.

With online newspapers, users can read the full coverage of breaking news in a timely manner. The credibility and strong brand recognition of well-established newspapers, close relationships they have with advertisers, and savings in overhead costs have led to a shift from the traditional printing process to online coverage.

Online newspapers are almost similar to the hard-copy newspapers and have the same legal boundaries such as laws regarding privacy and copyright issues. Moreover, news reporters are being taught to shoot videos and to write in the succinct manner necessary for news pages on the web.

6.2.6 World Wide Web

The technical definition of the World Wide Web (WWW) can be given as 'all the resources and users on the Internet that are using the hypertext transfer protocol (HTTP)'. On the web, all the documents are formatted in a special markup language called hypertext markup language (HTML) that supports links to other documents, graphics, audio, and/or video files. This feature enables users to jump from one document to another simply by clicking on hot

spots. You must have noted that when you position your cursor on a hotspot also known as hyperlink, the cursor changes to a hand-shaped figure. When you click on the hyperlink, you are taken to another part of the information.

In simple terminology, the WWW is a part of the Internet that allows easy navigation through the use of GUIs and hypertext links between different addresses.

The WWW was created in 1989 by Tim Berners-Lee. The Web, in simple terms, is the user part of the Internet. Novice or professional users make use of the Web to communicate and access information for business and recreational purposes. There are several applications called web browsers that make it easy to access the web. Some popular web browsers are Mozilla Firefox, Opera, Google Chrome, Netscape Navigator, and Microsoft's Internet Explorer.

Many a time, we think that the Internet and the WWW are the same, but this notion is not correct. The Internet and the Web work together. While the Internet provides the underlying structure, the Web on the other hand, utilizes that structure to offer content, documents, multimedia, etc. For example, the Internet is like the highway, and the WWW is like a truck that uses that highway to get from one place to another.

> Hypertext is a method of instant cross-referencing. On websites, certain words or phrases appear in text of a different colour than the rest; and are often underlined. When such words or phrases are selected, users are transferred to the site or page that is relevant to this word or phrase. Sometimes, there are buttons, images, or portions of images that can be clicked.

6.2.7 Online Shopping

Online shopping refers to buying goods and/or services from merchants who sell on the Internet. The popularity of the World Wide Web gave an excellent opportunity to merchants to sell their products to people who surf the Internet. Shoppers can now visit web stores 24×7 as per their convenience while sitting in their homes, offices, or even while travelling.

Consumers buy a variety of products from online stores ranging from books, clothing, household appliances, toys, hardware, software, to health insurance policies.

Nowadays, there is a rise in the number of online shoppers. This is mainly because when a customer shops at a brick-and-mortar store, he has to drive to the store, find a parking place, and walk throughout the store until he locates the products that are needed. Even after selecting all the products, the customer has to wait in long queues to get the billing done. In striking contrast to this, online shopping is very convenient. With online shopping, a shopper logs onto the Internet, visits the store's website, and selects the products. Once all the products have been selected, the user can click the option to calculate the invoice and pay for the purchase using his debit or credit card.

Although online shopping seems to be very convenient, many people still choose to avoid it. This can be due to several reasons. First, some people relish the experience of shopping in a mall. Moreover, they like to touch the merchandise, try on clothing, and be around other people. However, with online shopping, shoppers cannot touch the products or have any social interaction.

Second, people fear that their credit card information will be compromised. Since it is necessary to provide credit card information when purchasing products online, they fear that their personal information may be susceptible to theft.

Third, consumers often feel that the products they purchase are not accurately portrayed in the website's picture. The picture of an item may appear in a particular way, but the actual item may look completely different—perhaps of lesser quality. Many a time, it is also impossible to try on apparel when conducting online shopping.

6.3 INTERNET, INTRANET, AND EXTRANET

As studied in the previous section, the Internet is a global network of computers that connects millions of private, public, academic, business, and government networks from all over the world to share information, resources, and services. It is used by billions of users worldwide and carries information from a wide range of sources including newspapers, books, blogs, and web feeds in the form of interlinked web pages.

The Internet is not controlled by a central entity and relies on network devices such as routers and communication protocols (to be discussed in this chapter) to transfer data from one machine to another until it reaches its destination.

Uses

The uses of the Internet are as follows:

- It is helpful to students, academia, and research scholars for information retrieval.
- Business houses use the Internet for better communication (with customers, suppliers, government, etc.), marketing, and selling products to distant customers.
- People use the Internet for entertainment—listening to music or watching videos online.
- It helps people connect with their friends and relatives through instant messaging, email, Internet forums, and social networking.

Now let us have a look at the other two terms—Intranet and Extranet.

6.3.1 Intranet

The Intranet, like the Internet, is based on the TCP/IP technology and is primarily designed for resource and information sharing within an organization. The contents hosted on the Intranet can be accessed only by members within the organization who have appropriate access control rights (e.g., in a college teachers are allowed to view the details of all the students but students are not allowed to view the details of teachers). This means that the Intranet provides restricted access to its users.

Intranet is, therefore, an internal network used by organizations to connect their computers on a network. Since it authorizes only members of the organization to log in and access the network (along with resources and information), it is also called private Internet. An Intranet's website looks similar to any other website on the Internet but the firewall (discussed in the next Chapter) implemented in the Intranet protects it from unauthorized access. Firewalls are also useful when the Intranet has to provide access to the Internet. In such cases, it prevents access to its data and resources when an attempt is made to access it from outside the organization.

The main advantage of Intranet is that it can be used as a secured network with restricted access at a much less cost as compared to costs involved in building and managing private networks based on proprietary protocols. Any type of machine can be easily connected to the Internet. For this reason, Intranet has emerged as one of the fastest growing segments of the Internet.

Intranets may or may not provide access to the Internet.

Uses of Intranet

The uses of Intranet are as follows:

- It provides access to files, data, applications, and devices (printers, scanners, etc.) to members of the organization.
- It facilitates communication among people or work groups within the organization.
- It provides secure storage for storing, accessing, developing, and maintaining electronic documents, thereby, serving digital communication needs of an organization.
- It facilitates efficient and speedy workflow with reduced errors.
- It helps employees to communicate instantly with co-workers through internal email application, videoconferencing, discussion forums, and instant messaging software.
- It allows documents of any kind including text, images, video, etc. to be shared among users.
- It displays information regarding the organization and acts as an electronic bulletin board. Telephone directories, event calendars, procedure manuals, etc. are some of the important documents hosted on the Intranet.
- It posts vacancies, if any, on the organization's Intranet website.

6.3.2 Extranet

The Extranet, like the Internet and Intranet, is based on the TCP/IP technology to share an organization's resources. An Extranet extends an organization's Intranet by allowing people from outside the organization such as suppliers, customers, dealers, partners, and so on to have limited access to its internal network for business or education-related purposes. However, only users who authorize themselves with a valid username and password can access the Extranet. The username is used to determine the parts of the network to which the user can gain access.

Extranets are increasingly gaining popularity among business houses to exchange information. However, to implement an Extranet set-up, sound security and privacy measures (including firewalls, digital certificates, encryption, authentication, etc.) must be incorporated to ensure that organization's resources on the network are not illegally accessed by users with malicious intentions.

Like the Internet and Intranet, the Extranet is also accessible as a web portal. However, unlike the Intranet, the Extranet website can be accessed from anywhere, provided the user has supplied a valid username and password. Extranets are specifically designed for collaboration of work and sharing of resources. For this purpose, the Extranet connects multiple Intranets with each other.

Uses of Extranet

We will discuss some uses of the Extranet here:

- It facilitates cooperation among employees of different companies to ease their working on joint projects and share information.

- Extranet is a private network that uses Internet technology to securely share information and other resources of an organization with their suppliers, vendors, partners, and even customers.
- It is used to share product catalogues with wholesalers and customers.
- It has been very helpful in conducting employee training programmes in collaboration with other companies.
- Organizations use it to share news on common interest with their partner companies.

3.3 Key Differences among Internet, Intranet, and Extranet

Although the Internet, Extranet, and Intranet rely on the same TCP/IP technologies, they differ from each other in the levels of access they provide to their user group (as shown in Figure 6.2). Table 6.1 summarizes the difference between the three technologies.
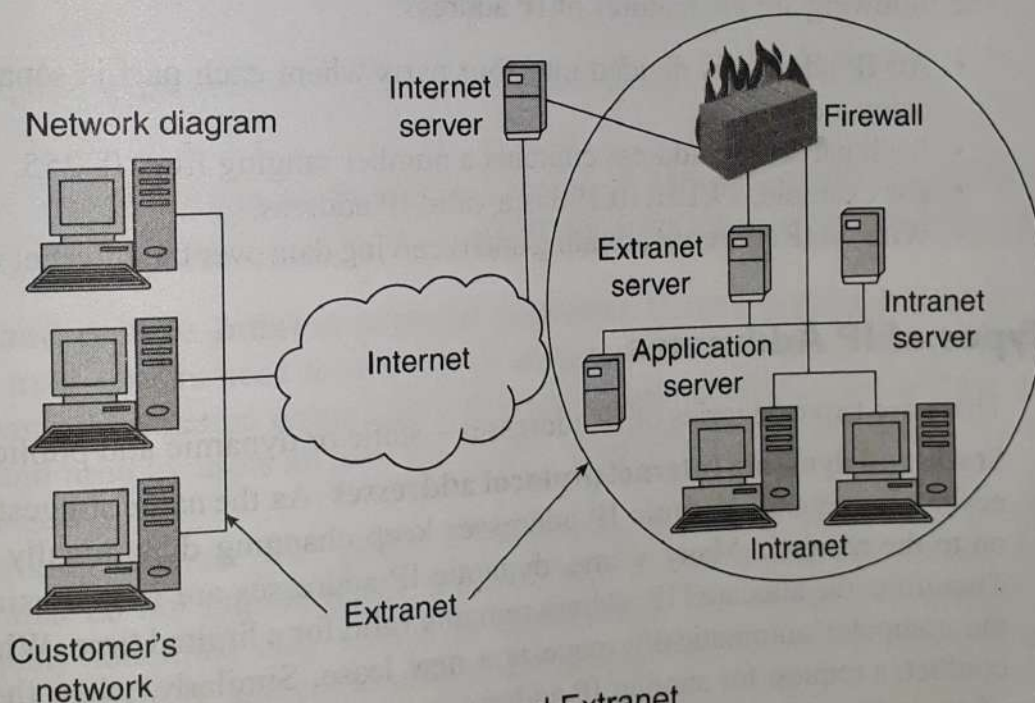

Figure 6.2 Internet, Intranet, and Extranet

Table 6.1 Differences between Internet, Intranet, and Extranet

Attribute	Internet	Intranet	Extranet
Size	Large	Small	Medium
Network type	Public	Private	Private
Accessible by	Everyone	People in the same organization	People in the same organization and limited access to business partners, supplies, customers, etc.
Implementation of security measures	Liberal	Authentication, firewalls	Authentication, digital certificates, firewalls
Vulnerability to cyber attacks	High	Low	Medium