
UNIT 4 NETWORK APPLICATIONS

Structure	Page Nos.
4.0 Introduction	76
4.1 Objectives	76
4.2 Internet Applications	76
4.2.1 Email	
4.2.2 Chatting	
4.3 Social Networking	79
4.3.1 Blogs	
4.3.2 Online multiplayer gaming	
4.3.3 Facebook	
4.3.4 Emerging Trends	
4.3.5 Characteristics of social Networking	
4.4 Railway Reservation System	85
4.5 Information Sharing	91
4.6 Electronic Governance	92
4.7 Online Processing and Collaborations	95
4.8 Mobile Applications	98
4.9 Summary	100
4.10 References/Further Readings	100
4.11 Solutions/Answers	101

4.0 INTRODUCTION

In this unit we are concentrating on the kind of applications that are used on the **Internet**. It is the part of network protocol (in the sense that they exchange messages with their peers on other machines) and part of traditional application program (in the sense that they interact with the windowing system, the file system, and ultimately, the user). It includes some of the most popular network applications available today Like: The World Wide Web and Email etc. We have also discussed some of the real-time applications like social networking, chatting, Railway Reservation system, Mobile Applications etc.

4.1 OBJECTIVES

After going through this unit you will be able to:

- define the logical structure of the Internet Applications;
- define the structure and working of network applications;
- define the concept of information sharing;
- discuss the basic features of E-Governance; and
- define the various components of mobile Applications;

4.2 INTERNET APPLICATIONS

The Internet is a global system of interconnected computer networks that uses the standard Internet protocol suite (often called TCP/IP, although not all applications use TCP) to serve billions of users worldwide. It is a network of networks that IS MODE of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries an extensive range of information

resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support email.

Most traditional communications media including telephone, music, film, and television are reshaped or redefined by the Internet, giving birth to new services such as Voice over Internet Protocol (VoIP) and Internet Protocol Television (IPTV). Newspaper, book and other print publishing are adapting to Web site technology, or are reshaped into blogging and web feeds. The Internet has enabled and accelerated new forms of human interactions through instant messaging, Internet forums, and social networking. Online shopping has boomed both for major retail outlets and small artisans and traders. Business-to-business and financial services on the Internet affect supply chains across entire industries.

The origins of the Internet reach back to research of the 1960s, commissioned by the United States government in collaboration with private commercial interests to build robust, fault-tolerant, and distributed computer networks. The funding of a new U.S. backbone by the National Science Foundation in the 1980s, as well as private funding for other commercial backbones, led to worldwide participation in the development of new networking technologies, and the merger of many networks. The commercialization of what was by the 1990s an international network resulted in its popularization and incorporation into virtually every aspect of modern human life. As of 2011, more than 2.2 billion people – nearly a third of Earth's population — use the services of the Internet.

The Internet has no centralized governance in either technological implementation or policies for access and usage; each constituent network sets its own standards. Only the overarching definitions of the two principal name spaces in the Internet, the Internet Protocol address space and the Domain Name System, are directed by a maintainer organization, the Internet Corporation for Assigned Names and Numbers (ICANN). The technical underpinning and standardization of the core protocols (IPv4 and IPv6) is an activity of the Internet Engineering Task Force (IETF), a non-profit organization of loosely affiliated international participants that anyone may associate with by contributing technical expertise.

Internet is a short form of the technical term internetwork, the result of interconnecting computer networks with special gateways or routers. The Internet is also often referred to as the Net.

The term the Internet, when referring to the entire global system of IP networks, has been treated as a proper noun and written with an initial capital letter. In the media and popular culture, a trend has also developed to regard it as a generic term or common noun and thus write it as "the internet", without capitalization. Some guides specify that the word should be capitalized as a noun but not capitalized as an adjective.

The terms Internet and World Wide Web are often used in everyday speech without much distinction. However, the Internet and the World Wide Web are not one and the same. The Internet establishes a global data communications system between computers. In contrast, the Web is one of the services communicated via the Internet. It is a collection of interconnected documents (web pages) and other resources, linked by hyperlinks and URLs. In addition to the Web, the Internet also powers a multitude of other services, including (among others) email, file transfer, newsgroups, and online games. Web services can exist apart from the internet, such as on a private intranet.

The Internet allows greater flexibility in working hours and location, especially with the spread of unmetered high-speed connections. The Internet can be accessed almost anywhere by numerous means, including through mobile Internet devices. Mobile phones, data cards, handheld game consoles and cellular routers allow users to connect to the Internet wirelessly. Within the limitations imposed by small screens and other limited facilities of such pocket-sized devices, the services of the Internet, including email and the web, may be available. Service providers may restrict the services offered and mobile data charges may be significantly higher than other access methods.

Educational material at all levels from pre-school to post-doctoral is available from websites. Examples range from CBeebies, through school and high-school revision guides, virtual universities, to access to top-end scholarly literature through the likes of Google Scholar. For distance education, help with homework and other assignments, self-guided learning, whiling away spare time, or just looking up more detail on an interesting fact, it has never been easier for people to access educational information at any level from anywhere. The Internet in general and the World Wide Web in particular are important enablers of both formal and informal education.

The low cost and nearly instantaneous sharing of ideas, knowledge, and skills has made collaborative work dramatically easier, with the help of collaborative software. Not only can a group cheaply communicate and share ideas but the wide reach of the Internet allows such groups more easily to form. An example of this is the free software movement, which has produced, among other things, Linux, Mozilla Firefox, and OpenOffice.org. Internet chat, whether in the form of an IRC chat room or channel, via an instant messaging system, or a social networking website, allows colleagues to stay in touch in a very convenient way when working at their computers during the day. Messages can be exchanged even more quickly and conveniently than via email. These systems may allow files to be exchanged, drawings and images to be shared, or voice and video contact between team members.

4.2.1 Email

Electronic mail is one of the most popular tools made available through the Internet. It is an efficient and effective means of network communication. You can call it as an electronic postal system. One of the most valuable features of communicating via email is that it is asynchronous, meaning the recipient need not be at a computer to receive the message you send. The message will be stored and available to be read when the recipient is ready to read it. In order to send and receive email, you must have access to an Email account.

4.2.2 Chatting

Chatting may refer to any kind of communication over the Internet that offers a real time direct transmission of text-based messages from sender to receiver, hence the delay for visual access to the sent message shall not hamper the flow of communications in any of the directions. Online chat may address point-to-point communications as well as multicast communications from one sender to many receivers and voice and video chat or may be a feature of a Web conferencing service.

Online chat in a lesser stringent definition may be primarily any direct text-based or video-based (webcams), one-on-one chat or one-to-many group chat (formally also known as asynchronous conferencing), using tools such as instant messengers, Internet Relay Chat, talkers and possibly MUDs. The expression online chat comes from the word chat which means "informal conversation". Online chat includes web-based applications that allow communication - often directly addressed, but anonymous - between users in a multi-user environment. Web conferencing is a more specific

online service, which is often sold as a service, hosted on a web server controlled by the vendor.

“Real-time communication between two users via computer. Once a chat has been initiated, either user can enter text by typing on the keyboard and the entered text will appear on the other user's monitor. Most networks and online services offer a chat feature.”

Issues with Chatting

There has been much criticism about what online chatting has done in today's society. Many people are accusing it of replacing proper English with short hand with an almost completely new hybrid language.

Writing is changing as it takes on some of the functions and features of speech. Internet chat-rooms and rapid real-time conferencing allow users to interact with whoever happens to coexist in cyberspace. These virtual interactions involve us in 'talking' more freely and more widely than ever before (Merchant, 2001). With chat-rooms replacing many face-to-face conversations it is necessary to be able to have quick conversation as if the person were present; so many people learn to type as quickly as they would normally speak. Critics are wary that this casual form of speech is being used so much that it will slowly take over common grammar; however, such a change has yet to be seen. With the increasing population of online chat-rooms there has been a massive growth of new words created or slang words, many of them documented on the website Urban Dictionary online chatting can be defined as:

“as new electronic modes of communication provoke similar anxieties amongst critics who express concern that young people are at risk, endangered by a rising tide of information over which the traditional controls of print media and the guardians of knowledge have no control on it”.

4.3 SOCIAL NETWORKING

Many people use the World Wide Web to access news, weather and sports reports, to plan and book vacations and to find out more about their interests. People use chat, messaging and email to make and stay in touch with friends worldwide, sometimes in the same way as some previously had pen pals. The Internet has seen a growing number of Web desktops, where users can access their files and settings via the Internet.

Social networking websites such as Facebook, Twitter, and MySpace have created new ways to socialize and interact, some of these social networking groups are depicted in the Figure 1. Users of these sites are able to add a wide variety of information to pages, to pursue common interests, and to connect with others. It is also possible to find existing acquaintances, to allow communication among existing groups of people. Sites like LinkedIn foster commercial and business connections. YouTube and Flickr specialize in users' videos and photographs.



Figure 1: Some of the Social networking groups

The Internet has been a major outlet for leisure activity since its inception, with entertaining social experiments such as MUDs and MOOs being conducted on university servers, and humor-related Usenet groups receiving much traffic. Today, many Internet forums have sections devoted to games and funny videos; short cartoons in the form of Flash movies are also popular. Over 6 million people use blogs or message boards as a means of communication and for the sharing of ideas. The pornography and gambling industries have taken advantage of the World Wide Web, and often provide a significant source of advertising revenue for other websites. Although many governments have attempted to restrict both industries' use of the Internet, in general this has failed to stop their widespread popularity.

4.3.1 Blogs

Blog is a website where entries are written as commentary or news on a particular subject such as food, politics, or local news; some function as more personal online diaries. A typical blog combines text, images, and links to other blogs, web pages, and other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art, photographs, videos and music and are part of a wider network of social media. One of the Blogging service named Blogger is depicted in the Figure 2.

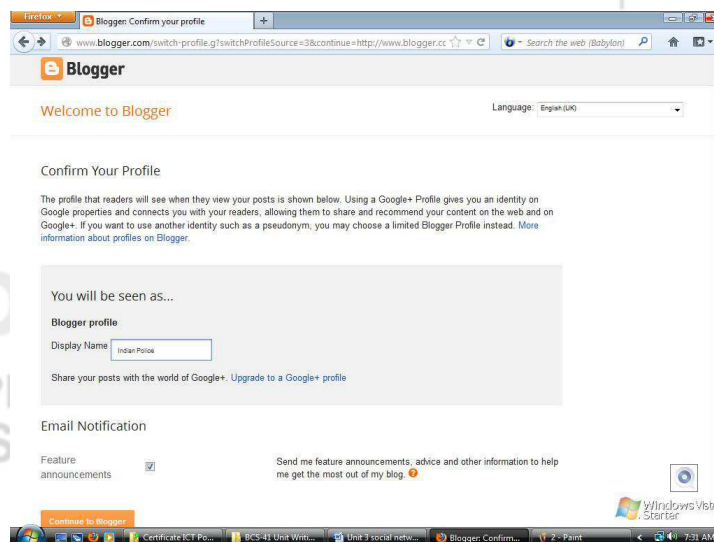


Figure 2: One of the Blogging service named Blogger

Blogging is gaining popularity in education, as it removes the technical barriers of writing and publishing online, which encourages students to keep a record of their ideas and thinking over time. Blogging also facilitates readers to give critical feedback on any topic, readers can add comments, where readers can be teachers, other students or a wider viewers. Teachers should investigate the potential of blogs, media-sharing services and other social software, which can be used to create new learning opportunities. Students can also use the blogs as a blog can provide a personal space online, to ask questions, comment on other questions, publish work, and link to other web sources. However a blog needn't be restricted to a single author, it can merge different kinds of ideas, including fellow students, teachers, and subject specialists. An example: <http://edu.blogs.com/>.

Blogging platform alternatives are following:

- WordPress.org is not the only blogging platform out there. There are several popular alternatives. First of all there is WordPress.com. Learn here about WordPress.org vs. WordPress.com.
- Google's Blogspot Blogger is another popular option. See here a bit on the difference between WordPress or Blogger.
- Tumblr is another popular choice. If you're wondering which one to pick, check Tumblr vs WordPress article.
- Google offer Blogger, which is an easy way to collaborate, discuss, or share your thoughts with others. In the following section we will discuss how to create a blog, and discuss the main features of Blogger.

4.3.2 Online multiplayer gaming

Another area of leisure activity on the Internet is multiplayer gaming. This form of recreation creates communities, where people of all ages and origins enjoy the fast-paced world of multiplayer games. These range from MMORPG to first-person shooters, from role-playing video games to online gambling. While online gaming has been around since the 1970s, modern modes of online gaming began with subscription services such as GameSpy and MPlayer. Non-subscribers were limited to certain types of game play or certain games. Many people use the Internet to access and download music, movies and other works for their enjoyment and relaxation. Free and fee-based services exist for all of these activities, using centralized servers and distributed peer-to-peer technologies. Some of these sources exercise more care with respect to the original artists' copyrights than others.

Internet usage has been correlated to users' loneliness. Lonely people tend to use the Internet as an outlet for their feelings and to share their stories with others, such as in the "I am lonely will anyone speak to me" thread.

Cyber-sectarianism is a new organizational form which involves: "highly dispersed small groups of practitioners that may remain largely anonymous within the larger social context and operate in relative secrecy, while still linked remotely to a larger network of believers who share a set of practices and texts, and often a common devotion to a particular leader. Overseas supporters provide funding and support; domestic practitioners distribute tracts, participate in acts of resistance, and share information on the internal situation with outsiders. Collectively, members and practitioners of such sects construct viable virtual communities of faith, exchanging personal testimonies and engaging in collective study via email, on-line chat rooms and web-based message boards."

A **social networking service** is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for

example, share interests, activities, backgrounds, or real-life connections. A social network service consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web-based and provide means for users to interact over the Internet, such as e-mail and instant messaging. Online community services are sometimes considered as a social network service, though in a broader sense, social network service usually means an individual-centered service where as online community services are group-centered. Social networking sites allow users to share ideas, activities, events, and interests within their individual networks.

The main types of social networking services are those that contain category places (such as former school year or classmates), means to connect with friends (usually with self-description pages), and a recommendation system linked to trust. Popular methods now combine many of these, with Facebook, Twitter and Google+ widely used worldwide.

Some social networks have additional features, such as the ability to create groups that share common interests or affiliations, upload or stream live videos, and hold discussions in forums. Geosocial networking co-opts Internet mapping services to organize user participation around geographic features and their attributes.

There is a trend towards more interoperability between social networks led by technologies such as OpenID and OpenSocial. In most mobile communities, mobile phone users can now create their own profiles, make friends, participate in chat rooms, create chat rooms, hold private conversations, share photos and videos, and share blogs by using their mobile phone. Some companies provide wireless services that allow their customers to build their own mobile community and brand it; one of the most popular wireless services for social networking in North America is Facebook Mobile.

4.3.3 Facebook

At present, Facebook is one of the popular Social Networking sites used by millions of people around the world, especially young people including your learners to connect to each other; Figure 3 shows the Login/Signup page for Facebook. This site is a free and effective way of communication on-line with your learners. You can, for example, send the messages, assignments and on-line resources for your subject. They in turn can communicate with you by posting questions etc.



Figure 3: Login/Signup page for Facebook

4.3.4 Emerging Trends

As the increase in popularity of social networking is on a constant rise, new uses for the technology are constantly being observed.

At the forefront of emerging trends in social networking sites is the concept of "real-time web" and "location-based." Real-time allows users to contribute content, which is then broadcast as it is being uploaded - the concept is analogous to live radio and television broadcasts. Twitter set the trend for "real-time" services, wherein users can broadcast to the world what they are doing, or what is on their minds within a 140-character limit. Facebook followed suit with their "Live Feed" where users' activities are streamed as soon as it happens. While Twitter focuses on words, Clixtr, another real-time service, focuses on group photo sharing wherein users can update their photo streams with photos while at an event. Facebook, however, remains the largest photo sharing site - Facebook application and photo aggregator Pixable estimates that Facebook will have more 100 billion photos by mid of 2011. In April, 2012, the image-based social media network *Pinterest* had become the third largest social network in the United States.

Companies have begun to merge business technologies and solutions, such as cloud computing, with social networking concepts. Instead of connecting individuals based on social interest, companies are developing interactive communities that connect individuals based on shared business needs or experiences. Many provide specialized networking tools and applications that can be accessed via their websites, such as LinkedIn. Others companies, such as Monster.com, have been steadily developing a more "socialized" feel to their career center sites to harness some of the power of social networking sites. These more business related sites have their own nomenclature for the most part but the most common naming conventions are "Vocational Networking Sites" or "Vocational Media Networks", with the former more closely tied to individual networking relationships based on social networking principles.

Foursquare gained popularity as it allowed for users to "check-in" to places that they are frequenting at that moment. *Gowalla* is another such service that functions in much the same way that Foursquare does, leveraging the GPS in phones to create a location-based user experience. Clixtr, though in the real-time space, is also a location-based social networking site, since events created by users are automatically geotagged, and users can view events occurring nearby through the Clixtr iPhone app. Recently, Yelp announced its entrance into the location-based social networking space through check-ins with their mobile app; whether or not this becomes detrimental to Foursquare or Gowalla is yet to be seen, as it is still considered a new space in the Internet technology industry.

One popular use for this new technology is social networking between businesses. Companies have found that social networking sites such as Facebook and Twitter are great ways to build their brand image.

There are five major uses for businesses and social media: to create brand awareness, as an online reputation management tool, for recruiting, to learn about new technologies and competitors, and as a lead generation tool to intercept potential prospects. These companies are able to drive traffic to their own online sites while encouraging their consumers and clients to have discussions on how to improve or change products or services.

4.3.5 Characteristics of social Networking

Social networks and science

By sharing information and knowledge with one another, people are able to "increase both their learning and their flexibility in ways that would not be possible within a self-contained hierarchical organization." Social networking is allowing scientific groups to expand their knowledge base and share ideas, and without these new means of communicating their theories might become "isolated and irrelevant".

Social networks and education

Social networks are also being used by teachers and students as a communication tool. Because many students are already using a wide range of social networking sites, teachers have begun to familiarize themselves with this trend in order to leverage student interest in relation to curriculum content. Some of this includes creating chat-room forums and groups to extend classroom discussion to posting assignments, tests and quizzes, through to assisting with homework outside of the classroom setting. Social network services are also being used to foster teacher-parent communication. These services make it possible and more convenient for parents to ask questions and voice concerns without having to meet face-to-face with their children's teachers. The advent of social networking platforms may also be impacting the way(s) in which learners engage with technology in general. The use of online social networks by school libraries is also increasingly prevalent and they are being used to communicate with potential library users, as well as extending the services provided by individual school libraries.

Social networks and their educational uses are of interest to many researchers. "Social networking sites, like much else on the internet, represent a moving target for researchers and policy makers." Recent trends indicate that 47% of American adults use a social network. A national survey in 2009 found that 73% of online teenagers use SNS, which is an increase from 55% three years earlier. Recent studies have shown that social network services provide opportunities within professional education, curriculum education, and learning. However, there are constraints in this area.

Learning uses within education

Educators and advocates of new digital literacy are confident that social networking encourages the development of transferable, technical, and social skills of value in formal and informal learning. In a formal learning environment, goals or objectives are determined by an outside department or agency. Tweeting, instant messaging, or blogging enhances student involvement. Students who would not normally participate in class are more apt to partake through social network services.

Networking allows participants the opportunity for just-in-time learning and higher levels of engagement. The use of SNSs allow educators to enhance the prescribed curriculum. When learning experiences are infused into a website, students utilize everyday for fun, students realize that learning can and should be a part of everyday life. It does not have to be separate and unattached. Informal learning consists of the learner setting the goals and objectives. It has been claimed that media no longer just influence our culture. They are our culture. With such a high number of users between the ages of 13-18, a number of skills are developed. Participants hone technical skills in choosing to navigate through social networking services. This includes elementary items such as sending an instant message or updating a status. The developments of new media skills are paramount in helping youth navigate the digital world with confidence. Social networking services foster learning through "Participatory Culture." A participatory culture consists of a space that allows engagement, sharing, mentoring, and an opportunity for social interaction. Participants of social network services avail of this opportunity. Informal learning, in the forms of participatory and social learning online, is an excellent tool for teachers to sneak in material and ideas that students will identify with and therefore, in a secondary manner, students will

learn skills that would normally be taught in a formal setting in the more interesting and engaging environment of social learning.

Sites like Twitter provide students with the opportunity to converse and collaborate with others in real time. Social networking services provide a virtual “space” for learners.

Social Interaction

Social networking is a way for one person to meet up with other people on the net. People use social networking sites for meeting new friends, finding old friends, or locating people who have the same problems or interests they have, called niche networking.

More and more relationships and friendships are being formed online and then carried to an offline setting. The relationships which start online are much more likely to succeed.

Being able to meet some-one as a "friend" and see what common interests you share and how you have built up your friend base and "likes" you can truly see a fuller picture of the person you are talking with. Most sites are free instead of being paid based which allows younger people with stricter budgets to enjoy some of the same features as those of adults who are more likely to be able to afford pay based sites. While not the intended or original use for these social sites, a large area of their current function has stemmed from people wanting to meet other people in person and with the extremely busy schedules of most people, it is a fast, reliable and easy way in which to do so that costs you little time and money (if any). Users do not necessarily share with others the content which is of most interest to them, but rather that which projects a good impression of themselves.

4.4 RAILWAY RESERVATION SYSTEM

Journey by rail has its own charm and glitz. And, railway reservation in India is no more a hassle. You can go by online train reservation services or any outlet for that matter. Despite the coming up of cheap fares in domestic airlines market, a substantial number of passengers and visitors yet journey by train. However, a train travel is both safe & comfortable and cheap. Indian people like to travel by train. A journey by train takes you to unearth the otherwise unexplored sites and mysteries of Mother India. As far as the railway reservation in India is concerned, there are myriad options at ones disposal. You can go by online train reservation system or any railway reservation booking outlet scattered everywhere.

However, Indian railway ticket reservation is no more a tedious job. Just lay your hands on any railway reservation booking outlet around you and make your way to the differing journey. With the onset of online railway reservation system things got much simpler for the passengers to book railway tickets online.

Indian railway is working incessantly to endow simply the best services to the passengers in India. Anyone with a system can have rail reservation instantly with no hassle. However, there are also systems of making railway reservation enquiry from virtually any place with your computer. This is how the whole system of booking railway tickets got easier in terms of accessibility and affordability. You are no longer required to sweat and fret over train ticket reservation in India. For any inquiry or for that matter any info you require regarding railway reservations just log onto the official site of Indian railways and you will have it.

Sitting at your home in front of a computer can give you all the relevant information on booking tickets in Indian railways. Booking any train on Indian Railways computerized passenger reservation system (PRS) network from any originating station or train passing through system station to any destination is that much easy nowadays. Be it about booking tickets, reservation enquiry, internet tickets (i-tickets), electronic tickets (e-tickets) or cancellation of tickets, things are just in place for the convenience of passengers.

Indian Railways-System and Network

Indian Railways is the world's second-largest railway, with 6,853 stations, 63,028 kilometers of track, 37,840 passenger coaches and 222,147 freight cars. Annually it carries some 4.83 billion passengers and 492 million tons of freight. Of the 11 million passengers who climb aboard one of 8,520 trains each day, about 550,000 have reserved accommodations. Their journeys can start in any part of India and end in any other part, with travel times as long as 48 hours and distances up to several thousand kilometers. The challenge is to provide a reservation system that can support such a huge scale of operations — regardless of whether it's measured by kilometers, passenger numbers, routing complexity, or simply the sheer scale of India.

The main challenges in front of the Indian railways are:

- Provide a reservation system that efficiently serves more than half a million people each day
- Ensure maximum uptime so reservation/ticketing/inquiry application is available 24 x 7
- Create a Web site that can accommodate more than one million hits per day
- Traveling on High Technology Indian Railways is one of the most advanced ministries in India, with an innovative and extensive IT environment — and a leading-edge reservation system powered by HP AlphaServer systems running the HP OpenVMS™ operating system and HP Reliable Transaction Router (RTR) middleware. Consider the scope of the operation.
- Good Technology means good service in 1986, the Ministry of Railways established the Centre for Railway Information Systems (CRIS) as an umbrella for all computer activities on Indian Railways. CRIS is responsible for designing, developing and implementing all major computer systems for the Railways. With its own R&D effort, CRIS has become a frontrunner in its field. One of CRIS's key technical achievements is a sophisticated reservation and ticketing application called Country-Wide Network for Enhanced Reservation and Ticketing (CONCERT), which runs on the OpenVMS AlphaServer platform. Centre for Railway Information Systems at Indian Railways, "OpenVMS is an extremely rugged and reliable operating system. Its built-in auditing feature provides us with excellent security." The primary challenge for CRIS is to provide an efficient passenger service by ensuring maximum uptime for its reservation/ticketing and inquiry application. The Railway must prepare charts that map passengers with their seats, and must post these charts outside each coach. CONCERT software enables the preparation of skeleton charts in advance for each train for the next three journey days. Indian Railway's current CONCERT application represents a steady progression of using the latest technologies available. In the mid-1980s, Indian Railways first computerized its reserved ticketing operation on VAX systems running VMS. This was done from five regional passenger reservation centres, each of which was a stand-alone site with its own local database. During the mid- to late 1990s, CRIS introduced CONCERT, which linked the five passenger reservation centres so

that reserved tickets from any station of Indian Railways could be issued to any other station from a single window. "CONCERT from CRIS has been able to improve the services to the passenger by offering single-window service to the passengers. RTR gives the user location transparency for the distributed database system. Thus, the reservation from one station to any other station can be given from a single window covering the round trip, which means passengers only have to stand in one queue. Indian railways perform various services to the passengers by using information technology, these are as follows:

- i) Passenger Reservation System Solution
- ii) Unreserved Ticketing System for Railways
- iii) Mobile Ticketing
- iv) Web Ticketing
- v) Kiosk-based Ticketing
- vi) Centralized (Hybrid) Ticketing System
- vii) Time Table and Scheduling System
- viii) Traffic Management Systems
- ix) Passenger Information Display System

As more and more people turned to the Web to find information about various services, Indian Railways decided to provide information related to passenger reservations to the public over the Internet. In 2000, CRIS designed and implemented Indian Railways' own Web site, which receives a staggering 1.2 million hits per day. The site is hosted by CRIS and runs on the OpenVMS AlphaServer platform.

In 1985, CMC Software company (a subsidiary company of TATA Consultancy Services) developed IMPRESS, the railway reservation system based online transaction processing (OLTP), for the Indian Railways, which has been successfully operating it since 1987. Since then, however, the system has undergone a major change for networking all nodes in the railway network. The current software is CONCERT, implemented by the Centre for Railway Information Systems (CRIS).

The impact of IMPRESS / CONCERT on the system's users as well as on the Indian Railways has been tremendous. The benefits include substantial savings in transportation costs and in reservation time, telescopic fare benefits for cluster journeys, reduced malpractice and, above all, a modern, efficient and convenient system.

For the Railways, there is substantial reduction in cost per ticket issued, manpower savings (a 40 per cent increase in transactions handled per day), savings in space required, less strenuous work, higher productivity and fewer errors in fare computation, concession calculations, etc.

IMPRESS is being enhanced proactively, using state-of-the-art relational database management systems on open systems. The enhanced IMPRESS is built around an RDBMS core and supports full client-server architecture. It can also work on character-based terminals (used in the reservation and charting modules) in a host-based environment.

The application has been designed as an open distribution system, so that the data and transaction volume can be segregated between multiple host sites. Networking is an inherent feature of the application.

- The IMPRESS software can support both graphic user interface (GUI) and character-based terminals, which act as front-ends installed at the booking counters to cater to passenger requests.
- This software conforms to open standards. Hence, it can be interfaced to other applications like airline reservation systems, hotel reservation systems, etc., which are also based on open standards.
- The IMPRESS software is 'parametric' in terms of data and business rules, for fare computation, refund rules, cancellation, break journey rules, etc. Here, business rules are also kept as data items in the back-end repository instead of being part of the application logic. Therefore, the system can absorb changes in business rules immediately, without having to regenerate the object code.
- The application is secured against intrusion by two-level user authentications as the topmost guard. Below it, the data is secured from external access through multiple-level privileges. A data encryption facility is available across the WAN to prevent hacking.
- Ticketing for Indian Railways

Almost 14 million of the 15 million people whom the Railways transports every day travel on unreserved tickets. Handling them has been a huge problem. The Indian Railways plans to cover 943 more stations in 2006-07, and ensure that a total of 6,000 stations have UTS as of March 31, 2009. Unreserved tickets were earlier offered only two hours before the scheduled departure of trains. This not only caused inconvenience to passengers (as they wait in long queues to purchase their tickets) but it also affected the IR adversely in terms of loss in revenues, cumbersome reporting and in poor demand analysis. While some of the trains ran overcrowded, the others went partially vacant.

The implementation of UTS eliminated the earlier lapses in ticketing and helped the IR to substantially control overcrowding. The system comprised a network of terminals wherefrom the passengers could buy unreserved tickets for any journey 30 days in advance.

The Unreserved Ticketing System allowed advance planning and rational analysis of passenger demands for unreserved coaches. It also helped the IR to effectively monitor sale of tickets on various trains and regulate the train capacities to the fluctuating demands of passengers. With an aggressive use of leading hardware, data management and network technology, IR could successfully address the needs of the passengers of unreserved trains.

A network covering 63, 140 route kms (as on March 31, 2002), the Indian Railways traverse the length and breadth of the country. Even though the railways have been divided into zones for better management and functionality, the railway reservations or the process for booking train tickets is centrally computerised. Operating 14,444 trains daily, the IRCTC or Indian Railway Catering and Tourism Corporation Limited, ensures that train schedule and train timings remain prompt. In effect, Indian Railways is the largest railway system in the world to be functioning under a single management.

The most cost efficient mode of transport, Indian Railways enjoy preference over other public transport systems. Used extensively for passenger and freight transfer, Indian Railways proves itself the forerunner in the transport sector as the most affordable, convenient and well connected network. With thousands of railway stations across the country, superior safety standards, lower environmental hazard and relatively low train fare, Indian Railways is the first choice for transfer goods and commodities

While the Indian Railway booking system has always been well organised, one immensely crucial step has been the launch of the IRCTC website (IRCTC online rail ticket reservation system is depicted in the following Figure 4), making all processes related to Indian Railways a breeze. Besides allowing online booking of rail ticket (s), it offers everything from railway map to railway ticket fare to timetable of train (s). A complete railway enquiry system is in place, with a click of the mouse allowing one to access / check the Indian Railways timetable, railway ticket availability and booking for any sector besides complete online train ticket reservations. Visitors to the website can use it not only for railway ticket reservation / booking but also to find out ticket availability and ticket confirmation or PNR status for any ticket on any train within the Indian Railways network

The screenshot displays the IRCTC website's 'Quick Book' interface. At the top, the header identifies the organization as the Indian Railway Catering and Tourism Corporation Limited, a Government of India Enterprise. The navigation bar includes links for Train Reservation, Hotels, Tourist Trains, Tour Packages, Book Cabs, and Loyalty Program. The left sidebar contains sections for User Profile, My Transactions, Services, and General. The main content area is titled 'Quick Book' and includes a 'Mandatory' section with fields for From, To, Date, Train No., Ticket Type, and Quota. Below this is a 'Show Availability' button. The 'Passenger Details' section features a table with columns for SNo, Name, Age, Sex, Berth Preference, and Senior Citizen. The table has six rows for passenger entry. Below the table, there is a checkbox for 'Consider for Auto Upgradation' and a note about children below 5 years. A 'Child Passenger Details' section follows with similar fields for child passengers. At the bottom, there are fields for Mobile Number and Payment Options.

Figure 4: IRCTC online rail ticket reservation system

With various seating arrangements like AC 1 tier, AC 2 tier, AC 3 tier, AC Chair Car, Sleeper and General in most long distance trains and another range of seat availability in the metro trains within urban areas, the Indian Railways offers a plethora of choices. Travellers can take their pick and enjoy the convenience and affordability of this mode of transport.

The list of **major Indian Railway Zones** is as follows:

Central Indian Railways: This is the oldest of Indian railway zones and one of the largest of the 16 zones formed by Indian railways.

Eastern Indian Railways: The Eastern Railway (ER) zone is one of the important Indian Railway zones. With its headquarters in Kolkata, the Eastern Zone is divided further into four divisions namely Mald, Howrah, Asansol and Sealdah for better working.

Northern Indian Railways: It is one of the nine older zones of Indian Railways. New Delhi, the national capital of India serves as headquarters of this Indian Railway Zone

Southern Indian Railways: This is the first zone formed after India got liberated

from British Rule. Southern Indian Railway Zone was established on April 14, 1951 by combination of always of three states.

Western Indian Railways: This Indian railways zone is amongst the most hustling and lively rail networks of the country. The headquarters of Western Indian Railway is situated in Mumbai city.

☛ Check Your Progress 1

1. Select the right choice.
- a) Which of the following identifies a specific web page and its computer on the Web?

A) Web site
B) Web site address
C) URL
D) Domain Name

- b) What type of telecommunications hardware allows you to access the web?

A) Browser
B) Modem
C) FTP protocol
D) IRC

- c) The mail server as defined in the text uses the _____ protocol.

A) HTTP
B) FTP
C) POP
D) SMTP

2. Discuss standards of email protocol?

3. Write a note on social networking service?

4.5 INFORMATION SHARING

Information sharing describes “the exchange of data between various organizations, people and technologies”.

There are several types of information sharing:

- Information shared by individuals (such as a video shared on Facebook or YouTube).
- Information shared by organizations (such as the RSS feed of an online weather report).
- Information shared between firmware/software (Such as the IP addresses of available network nodes or the availability of disk space).

The advent of wide distributed networks, intranets, cross-platform compatibility, application porting, and standardization of IP protocols have all facilitated the huge growth in global information sharing.

When it comes to personal information however, no matter how easy it is to port the actual data, there are laws in most countries prohibiting the sharing of personal data without explicit permission being granted. In the US and Europe it is a criminal offense to share any personal data about anyone without such explicit permission.

There is plenty of other information sharing that does not fall under the law and information sharing is increasing as more networks and organizations connect and information becomes easier to share across the internet.

Data was formerly frequently kept in silos and often not shared among other entities due to its proprietary, non-portable format or the inability to import/export data. Even simple items such as dates were stored in a whole range of different formats making the sharing of such a simple field a potential nightmare. The same applied to a whole range of data, and even if it was compatible it was often not possible to physically transfer the data from one platform to another.

Today these problems have all been coded out and information sharing is common between computer networks; information sharing has become especially prevalent due to social networking. These 21st century network models actively encourage the sharing of information across social networks.

Facebook has 750 million accounts, YouTube has over 400 million and the other social networking sites and applications have established between them a sharing network of over a billion people. In terms of information sharing this is a global proportion with almost 10% of the world's population sharing information across common networks regularly.

After the terrorist attacks of September 11th, information sharing became one of the United States government's goals in developing their resources to try to avert such atrocities. It was mandated among government agencies and departments that personnel create a methodology for regularly sharing relevant information. The US needed information sharing improvements to respond to various threats more effectively. The lesson was learned that when information is hoarded instead of shared, those needing it may not be able to react in a timely manner. Using information sharing intelligently has been shown to be a more effective way to manage any organization; a government or a business.

Information sharing is crucial to many businesses, helping to promptly meet customer and client needs through customer relationship systems which share information about products and services and improve access to their customers.

Information sharing has also allowed easy availability of credit history details which helps consumers access more services. Consumers can have access to banking, financial and credit products from across the nation and even internationally where appropriate.

Hospitals sharing medical records (under stringent conditions) about people so that their medical personnel can make better decisions, is a good example of how organizations can share information for productive purposes rather than for social entertainment as with Facebook.

Overall, when used intelligently, information sharing is a useful way of lowering costs, improving overall accuracy of public data and allowing organizations and individuals alike to have access to information that they might need and entertainment that they want to experience.

4.6 ELECTRONIC GOVERNANCE

It is the use of a range of modern Information and Communication Technologies such as Internet, Local Area Networks, mobiles etc. by Government to improve the effectiveness, efficiency, service delivery and to promote democracy. E-Government can transform citizen service, provide access to information to empower citizens, enable their participation in government and enhance citizen economic and social opportunities, so that they can make better lives, for themselves and for the next generation. Governments are specialized institutions that contribute to governance. Representative governments seek and receive citizen support, but they also need the active cooperation of their public servants. Governance is the outcome of politics, policies, and programs.

The primary delivery models of e-Government can be divided into:

- Government-to-Citizen or Government-to-Consumer (G2C)
- Government-to-Business (G2B)
- Government-to-Government (G2G)
- Government-to-Employees (G2E)

Within each of these interaction domains, five kinds of activities take place:

1. Informing the citizen
2. Representing the citizen
3. Encouraging the citizen to vote
4. Consulting the citizen
5. Involving the citizen

The ultimate goal of the E-Government is to be able to offer an increased portfolio of public services to citizens in an efficient and cost effective manner. E-government allows for government transparency. Government transparency is important because it allows the public to be informed about what the government is working on as well as the policies they are trying to implement. Simple tasks may be easier to perform through electronic government access. Many changes, such as marital status or address changes can be a long process and take a lot of paper work for citizens. E-government allows these tasks to be performed efficiently with more convenience to

individuals. E-government is an easy way for the public to be more involved in political campaigns. It could increase voter awareness, which could lead to an increase in citizen participation in elections. It is convenient and cost-effective for businesses, and the public benefits by getting easy access to the most current information available without having to spend time, energy and money to get it.

E-government helps simplify processes and makes access to government information more easily accessible for public sector agencies and citizens. In addition to its simplicity, e-democracy services can reduce costs. The anticipated benefits of e-government include efficiency, improved services, better accessibility of public services, and more transparency and accountability. One goal of e-government will be greater citizen participation. Through the internet, people from all over the country can interact with politicians or public servants and make their voices heard. Blogging and interactive surveys will allow politicians or public servants to see the views of the people they represent on any given issue. Chat rooms can place citizens in real-time contact with elected officials, their offices or provide them with the means to replace them by interacting directly with public servants, allowing voters to have a direct impact and influence in their government. These technologies can create a more transparent government, allowing voters to immediately see how and why their representation in the capital is voting the way they are. This helps voters better decide who to vote for in the future or how to help the public servants become more productive. A government could theoretically move more towards a true democracy with the proper application of e-government. Government transparency will give insight to the public on how decisions are made and hold elected officials or public servants accountable for their actions. The public could become a direct and prominent influence in government legislature to some degree.

Characteristics of E-Governance

E-government allows citizens to interact with computers to achieve objectives at any time and any location, and eliminates the necessity for physical travel to government agents sitting behind desks and windows. Improved accounting and record keeping can be noted through computerization, and information and forms can be easily accessed, equaling quicker processing time. A network architecture of E-governance is shown in the Figure 5 given blow. It shows the different parties and agencies of governance can be connected using different networks devices and Internet.



Figure 5: Network Architecture of E-Governance. Source: <http://www.mapit.gov.in>

On the administrative side, access to help find or retrieve files and linked information can now be stored in databases versus hardcopies stored in various locations. Individuals with disabilities or conditions no longer have to be mobile to be active in government and can be in the comfort of their own homes.

The primary delivery models of e-Government are classified depending on who benefits. In the development of public sector or private sector portals and platforms, a system is created that benefits all constituents. Citizens needing to renew their vehicle registration have a convenient way to accomplish it while already engaged in meeting the regulatory inspection requirement. On behalf of a government partner, business provides what has traditionally, and solely, managed by government and can use this service to generate profit or attract new customers. Government agencies are relieved of the cost and complexity of having to process the transactions. To develop these public sector portals or platforms, governments have the choice to internally develop and manage, outsource, or sign a self-funding contract. The self-funding model creates portals that pay for themselves through convenience fees for certain e-government transactions, known as self-funding portals.

Social networking is an emerging area for e-democracy. The social networking entry point is within the citizens' environment and the engagement is on the citizens' terms. Proponents of e-government perceive government use of social networks as a medium to help government act more like the public it serves. Examples can be found at almost every state government portal through Facebook, Twitter, and YouTube widgets. Government and its agents also have the opportunity to follow citizens to monitor satisfaction with services they receive. Through ListServes, RSS feeds, mobile messaging, micro-blogging services and blogs, government and its agencies can share information to citizens who share common interests and concerns. Government is also beginning to Twitter.

E-Government Forum

Since electronic government is new to everyone throughout the world, why couldn't an international matching system be developed so that anyone around the world can search by government function (e.g., Chief Information Officer); role (e.g., state or federal Department of Transportation); city, state, or country; type of technology used in development of the e-government system; sharing of best practices; licensing or buying existing software or platforms from the agency concerned; collaborating in the integrated development of a vertical (statewide) or horizontal (national or international) systems; or exchanging ideas. Theoretically, ALL government employees in the United States or throughout the world could be included. This could be easily achieved using modern technology and foster greater peace and understanding. Almost like an online Peace Corps.

Check Your Progress 2

1. Select the right choice.

- a) Why do we store information? To refer to it:
- (A) When a decision is to be made or to confirm a fact.
 - (B) If the original data is lost or corrupted.
 - (C) Analyze to make some interpretation, explanation or resolution with it.
 - (D) Distribute for further use
 - (E) All of the above.

.....

.....

- b) Most of the electronic payment systems on internet use _____ to ensure confidentiality and security of the payment information.
- (A) Quantum Computing
 - (B) Cryptography
 - (C) Both (A) & (B)
 - (D) None of the above

.....

.....

- c) An electronic check book device is a combination of
- (A) Hardware and a digital signature
 - (B) Software and information about user
 - (C) Secure hardware and software
 - (D) None of the above

.....

.....

2. Discuss the Goal's of e-government?

.....

.....

.....

.....

3. Write a note on social networking service?

.....

4.7 ONLINE PROCESSING AND COLLABORATIONS

The terms "**online**" and "**offline**" (also stylized as "**on-line**" and "**off-line**") have specific meanings in regard to computer technology and telecommunications. In general, "online" indicates a state of connectivity, while "offline" indicates a disconnected state. In common usage, "online" often refers to the Internet or the World Wide Web.

The concepts have however been extended from their computing and telecommunication meanings into the area of human interaction and conversation, such that even offline can be used in contrast to the common usage of online. For example, discussions taking place during a business meeting are "online", while issues that do not concern all participants of the meeting should be "taken offline" — continued outside of the meeting.

To be considered online, one of the following must apply to a device:

- Under the direct control of another device
- Under the direct control of the system with which it is associated
- Available for immediate use on demand by the system without human intervention
- Connected to a system, and is in operation
- Functional and ready for service

In contrast, a device that is offline meets none of these criteria (e.g., its main power source is disconnected or turned off, or it is off-power).

An online system differs from an offline system in that templates are employed whenever the user inserts content into a web page for publication. These templates are said to be 'on demand' in that they are applied as per the user's requirements.

Content is stored in a database which is a mandatory requirement, especially if the user wishes to view, amend or upgrade that content.

Template processing takes place as and when requested compared to offline systems which pre-process all of their content and apply their templates beforehand.

One advantage of an online processing is its extensibility which means greater functionality in the form of add-on's such as image galleries, forum, wikis and blogs. This scalability is an important feature of these types of CMS.

Other advantages include:

- The user views content in real-time (published)
- The user is only shown relevant content, e.g. content which is out of date is withdrawn once it has reached its 'sell by date'.
- The content can be accessed by multiple authors/editors in a variety of locations.
- Content can be maintained from any location which has internet access.

The downsides to this type of system include a slowing down of performance due to the fact that every time a user views a page, that page is retrieved from the database which slows down the processing speed exponentially.

This system requires a fast connection and an up to date browser especially in regard to content creation. Both of these are improving all the time but performance speeds are quicker on a local computer as used for an offline system.

Collaboration is working together to achieve a goal. It is a recursive process where two or more people or organizations work together to realize shared goals, (this is more than the intersection of common goals seen in co-operative ventures, but a deep, collective, determination to reach an identical objective. Most collaboration requires leadership, although the form of leadership can be social within a decentralized and egalitarian group. In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources. Collaboration is also present in opposing goals exhibiting the notion of adversarial collaboration, though this is not a common case for using the word. Structured methods of collaboration encourage introspection of behavior and communication. These methods specifically aim to increase the success of teams as they engage in collaborative problem solving. Forms, rubrics, charts and graphs are useful in these situations to objectively document personal traits with the goal of improving performance in current and future projects.

Types of Collaborations:

Project management

Project Management developed from different fields of application including construction, engineering, and defense.

Learning community

A learning community is a group of people who share common emotions, values or beliefs, are actively engaged in learning together from each other, and by habituation. Such communities have become the template for a cohort-based, interdisciplinary approach to higher education. This may be based on an advanced kind of educational or 'pedagogical' design. the participants of learning community must feel some sense of loyalty and belonging to the group (membership) that drive their desire to keep working and helping others, also the things that the participant do in must affect what happened in the community, that means, an active and not just a reactive performance (influence). Besides a learning community must give the chance to the participants to meet particular needs (fulfillment) by expressing personal opinions, asking for help or specific information and share stories of events with particular issue included (emotional connections) emotional experiences.

Business

Collaboration in business can be found both inter- and intra-organization and ranges from the simplicity of a partnership and crowd funding to the complexity of a multinational corporation. Collaboration between team members allows for better communication within the organization and throughout the supply chains. It is a way of coordinating different ideas from numerous people to generate a wide variety of knowledge. Collaboration with a selected few firms as opposed to collaboration with a large number of different firms have been shown to positively impact firm performance and innovation outcomes. The recent improvement in technology has provided the world with high speed internet, wireless connection, and web-based collaboration tools like blogs, and wikis, and has as such created a "mass collaboration." People from all over the world are efficiently able to communicate and

share ideas through the internet, or even conferences, without any geographical barriers. The power of social networks is beginning to permeate into business culture where many collaborative uses are being found including file sharing and knowledge transfer.

Education

Generally defined, an Educational Collaborative Partnership is ongoing involvement between schools and business/industry, unions, governments and community organizations. Educational Collaborative Partnerships are established by mutual agreement between two or more parties to work together on projects and activities that will enhance the quality of education for students while improving skills critical to success in the workplace.

Collaboration in Education- two or more co-equal individuals voluntarily bring their knowledge and experience together by interacting toward a common goal in the best interest of students for the betterment of their education success. Students achieve team building and communication skills meeting many curricular standards. Students have the ability to practice real-world communication experiences. Students gain leadership through collaboration and empower peer to peer learning.

Technology

Due to the complexity of today's business environment, collaboration in technology encompasses a broad range of tools that enable groups of people to work together including social networking, instant messaging, team spaces, web sharing, audio conferencing, video, and telephony. Broadly defined, any technology that facilitates linking of two or more humans to work together can be considered a collaborative tool. Wikipedia, Blogs, even Twitter are collaborative tools. Many large companies are developing enterprise collaboration strategies and standardizing on a collaboration platform to allow their employees, customers and partners to intelligently connect and interact.

4.8 MOBILE APPLICATIONS

A **mobile application** (or **mobile app**) is a software application designed to run on smart phones, tablet computers and other mobile devices. They are available through application distribution platforms, which are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Marketplace and BlackBerry App World. Some apps are free, while others have a price. Usually, they are downloaded from the platform to a target device, such as an iPhone, BlackBerry, Android phone or Windows Phone 7, but sometimes they can be downloaded to less mobile computers, such as laptops or desktops. For apps with a price, generally a percentage, 20-30%, goes to the distribution provider (such as iTunes), and the rest goes to the producer of the app.

The popularity of mobile applications has continued to rise, as their usage has become increasingly prevalent across mobile phone users.

For mobile applications, the fixed telephone system is not suitable. Mobile phones are currently in widespread use for voice and will soon be in widespread use for data. The first generation was analog, dominated by AMPS. The second generation was digital, with D-AMPS, GSM, and CDMA the major options. The third generation will be digital and based on broadband CDMA.

An alternative system for network access is the cable television system, which has gradually evolved from a community antenna to hybrid fiber coax. Potentially, it

offers very high bandwidth, but the actual bandwidth available in practice depends heavily on the number of other users currently active and what they are doing.

Mobile apps were originally offered for general productivity and information retrieval, including email, calendar, contacts, and stock market and weather information. However, public demand and the availability of developer tools drove rapid expansion into other categories, such as mobile games, factory automation, GPS and location-based services, banking, order-tracking, and ticket purchases. The explosion in number and variety of apps made discovery a challenge, which in turn led to the creation of a wide range of review, recommendation, and curation sources, including blogs, magazines, and dedicated online app-discovery services.

Mobile Apps are apps or services that can be pushed to a mobile device or downloaded and installed locally.

Classification of Mobil Apps:

- **Browser-based:** apps/services developed in a markup language
- **Native:** compiled applications (device has a runtime environment). Interactive apps such as downloadable games.
- **Hybrid:** the best of both worlds (a browser is needed for discovery)

Mobile application development is the process by which application software is developed for low-power handheld devices, such as personal digital assistants, enterprise digital assistants or mobile phones. These applications can be pre-installed on phones during manufacture, downloaded by customers from various mobile software distribution platforms, or delivered as web applications using server-side or client-side processing (e.g. JavaScript) to provide an "application-like" experience within a Web browser.

☛ Check Your Progress 3

1. Select the right choice.
 - a) What do the letters GSM currently mean?
 - (A) Global Special Mobile
 - (B) Greater System's Mobile
 - (C) Global Systems for Mobile Communications
 - (D) None of the above!

.....

.....

- b) How is this problem solved in analogue cellular network?
 - (I) Base Station continuously transmits the Mobile Identification Number (MIN) and received by the mobile phone.
 - (II) Mobile phone continuously transmits the Signal Audio Tone (SAT) and received by the base station.
 - (III) Overall size of the cluster is increased
 - (IV) Increasing the bandwidth allocated to each user.

.....

.....

- c) Why does GSM use TDMA, as opposed to CDMA?

- (I) When GSM was planned, CDMA was not approved as a multiple access system.
 - (II) TDMA is better than CDMA.
 - (III) CDMA is not really needed in Europe.
 - (IV) CDMA is too expensive to implement.
- (A) I and III
 - (B) I only
 - (C) II and III
 - (D) I and IV

.....

.....

2. What is collaboration? Discuss in detail.

.....

.....

.....

.....

3. Discuss the advantages of Mobile applications?

.....

.....

.....

.....

4.9 SUMMARY

This completes our discussion on the introductory concepts of Network Applications. The internet architecture discussed in the unit, we have also discussed WWW and email formats in detail. The information given on various topics such as Information Sharing, Railway Reservation System, E-Governance, Social Networking, Online Processing etc. We have also includes the discussions based on latest trends and technology used for the internet applications (Mobile Applications) which helps the reads to keep your knowledge up to date. In addition to further readings and test their skills question answer sessions are included at the end of each sections. In the next block of this course, you will learn fundamental details for setting up a small local area network including wired and wireless setup. Next block will also cover the foundational details of network security protocols and wireless networking.

4.10 REFERENCES/FURTHER READING

1. Introduction to Data Communication & Networking, 3rd Edition, Behrouz Forouzan, Tata McGraw Hill.
2. Computer Networks, A. S. Tanenbaum 4th Edition, Practice Hall of India, New Delhi. 2003.

3. Douglas E. Comer, Internetworking with TCP/IP Vol.1: Principles, Protocols, and Architecture (4th Edition).
4. James F. Kurose, Computer Networking: A Top-Down Approach Featuring the Internet (3rd Edition).
5. Larry L. Peterson, Computer Networks: A Systems Approach, 3rd Edition (The Morgan Kaufmann Series in Networking).
6. www.wikipedia.org
7. W. Richard Stevens, The Protocols (TCP/IP Illustrated, Volume 1).
8. William Stallings, Data and Computer Communications, Seventh Edition.

4.11 SOLUTIONS/ANSWERS

☛ Check Your Progress 1

1.
 - a) (D)
 - b) (B)
 - c) (C)
2. The main standards that relate to the protocols of email transmission and reception are:
 - i) **Simple Mail Transfer Protocol (SMTP)** - which is used with the TCP/IP protocol suite? It has traditionally been limited to the text based electronic messages.
 - ii) **Multipurpose Internet Mail Extension (MIME)** - Which allows the transmission and reception of mail that contains various types of data, such as speech, images, and motion video? It is a newer standard than STMP and uses much of its basic protocol.
 - iii) **S/MIME (Secure MIME)**. RSA Data security created S/MIME which supports encrypted e-mail transfer and digitally signed electronic mail.
3. A **social networking service** is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections. A social network service consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web-based and provide means for users to interact over the Internet, such as e-mail and instant messaging. Online community services are sometimes considered as a social network service, though in a broader sense, social network service usually means an individual-centered service where as online community services are group-centered. Social networking sites allow users to share ideas, activities, events, and interests within their individual networks.

☛ Check Your Progress 2

1.
 - a) (D)
 - b) (B)
 - c) (B)
2. **Goal's of e-government**

One goal of e-government will be greater citizen participation. Through the internet, people from all over the country can interact with politicians or public servants and make their voices heard. Blogging and interactive surveys will allow politicians or public servants to see the views of the people they represent on any given issue. Chat rooms can place citizens in real-time contact with elected officials, their offices or provide them with the means to replace them by interacting directly with public servants, allowing voters to have a direct impact and influence in their government. These technologies can create a more transparent government, allowing voters to immediately see how and why their representation in the capital is voting the way they are. This helps voters better decide who to vote for in the future or how to help the public servants become more productive. A government could theoretically move more towards a true democracy with the proper application of e-government.

3. A **social networking service** is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections. A social network service consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web-based and provide means for users to interact over the Internet, such as e-mail and instant messaging. Online community services are sometimes considered as a social network service, though in a broader sense, social network service usually means an individual-centered service where as online community services are group-centered. Social networking sites allow users to share ideas, activities, events, and interests within their individual networks.

☛ Check Your Progress 3

1. a) (C)
b) (D)
c) (A)
2. **Collaboration** is working together to achieve a goal. It is a recursive process where two or more people or organizations work together to realize shared goals, (this is more than the intersection of common goals seen in co-operative ventures, but a deep, collective, determination to reach an identical objective. Most collaboration requires leadership, although the form of leadership can be social within a decentralized and egalitarian group. In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources. Collaboration is also present in opposing goals exhibiting the notion of adversarial collaboration, though this is not a common case for using the word. Structured methods of collaboration encourage introspection of behavior and communication. These methods specifically aim to increase the success of teams as they engage in collaborative problem solving. Forms, rubrics, charts and graphs are useful in these situations to objectively document personal traits with the goal of improving performance in current and future projects.
3. Mobile Apps are internet applications designed to run on smartphones and other mobile devices. mobile applications help users by connecting them to Internet services more commonly accessed on desktop or notebook computers. While opportunities abound, we have identified three advantages of using mobile apps for your business: speed, volume of information, and advertising.