SOCIAL INFORMATICS

BA SOCIOLOGY

2011 Admission onwards

III Semester

CORE COURSE

UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

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SCHOOL OF DISTANCE EDUCATION

STUDY MATERIAL

BA SOCIOLOGY

III Semester

CORE COURSE

SOCIAL INFORMATICS

Prepared by:

Module I & II

> *Smt.Rakhi.N.*
> *Assistant Professor,*
> *Department of Sociology,*
> *Zamorins Guruvayoorappan College,*
> *Calicut.*

Module III & IV

> *Smt.Shilujas.M,*
> *Lecturer, Department of Sociology,*
> *Farook College,*
> *Feroke.*

Scrutinised by:

> *Dr.N.P.Hafiz Mohamad,*
> *"Manasam",*
> *Harithapuram,*
> *Chevayoor,*
> *Calicut.*

Layout & Settings
Computer Section, SDE

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MODULE I
OVERVIEW OF INFORMATION TECHNOLOGY

Computers form an integral part of contemporary society. The influence of computers can be seen in all walks of life. Computers are used to make human tasks easy and fast. They are an essential part of every emerging technology.

Features of modern personal computer

A Personal Computer PC may be a home computer, or may be found in an office intended for regular use. A personal computer (PC) is a general-purpose computer, used for day to day activities in different areas including education, business, administration and health. Due to its size and capabilities, PC is useful for the users. A PC can be operated directly and may be used for computational, word processing, and data storage purpose. The features of the modern personal computer are discussed below

a) Speed: Computers process data at a much faster pace. It can perform within seconds a task which may take days if a human being does it.

b) Accuracy: The computers are comparatively more accurate. The level of accuracy of a computer depends upon the type of machine used and the instructions given. Advanced machines and clear instructions yield accurate results.

c) Reliable: A computer is generally found to be reliable too. At the hardware level, the computer requires minimum human intervention. Also there are built in diagnostic capabilities to continuously monitor the system. All this ensures maximum reliability.

d) Storage capacity: Computers are capable of storing large amount of data and it can recall the data as and when required.

e) Versatility: Computers are quite versatile in nature. It means that they can perform multiple tasks at the same time.

f) Diligence: being a machine, a computer does not have tiredness or lack of concentration.

In spite of all these advantages, the computer has its own limitations too. Being a machine, a computer can perform only what it is programmed for. It can only operate on user provided data. The use of a computer is limited to the processing of quantitative data. A computer does not have the cognitive capacities to evaluate qualitative data. To ensure accurate and reliable results, a computer should be properly maintained.

Peripherals

A peripheral is a device connected to a host computer, but not part of it. It expands the host's capabilities, but does not form part of the core computer architecture. It is often, but not always, partially or completely dependent on the host. A peripheral is generally defined as any auxiliary device such as a computer mouse, keyboard, hard drive, etc. that connects to and works with the computer in some way. Usually, the word peripheral is used to refer to a device external to the computer case, like a scanner, but the devices located inside the computer case are also technically peripherals. There are three different types of peripherals: Input, Output, and Storage.

An input peripheral provides input to the computer, from the user - such as a mouse or keyboard. An output peripheral provides output to the user, from the computer - such as a computer monitor or printer. A storage peripheral stores data in between computing sessions - such as a hard drive or flash drive.

Hardware and Software

Hardware is the Physical parts or the tangible parts of the computer which includes CPU, memory, monitor, keyboard, mouse etc. Computer software is a collection of computer programs that perform some tasks on a computer system.

Hardware

Hardware is an essential component of any computer system. A computer is made up of several different components. All these components work together in order to produce desired result. The physical components of a computer which can be seen and touched are known as hardware of a computer system. Each of these parts is designed for a specific purpose. Central Processing Unit (CPU), Memory, Input / Output devices like mouse, keyboard, Monitor, CPU, Memory etc. are different hardware components of a computer system. These hardware components are the building block of a computer.

Input devices

An input device is used to enter data and instructions into the computer. The most common input devices are the keyboard, mouse, microphones, digital cameras etc.

The most common type of keyboard uses the QWERTY layout. The layout gets its name from the first six alphabetic keys on the left of the keyboard. Another alternative layout of the keyboard is the DVORAK keyboard. It puts the most commonly used letters in English in the middle row of the keyboard. This design reduces the distance the fingers travel for each keystroke, thus increasing the typing speed. Other keyboards like the virtual laser keyboard and the gaming keyboard are also in use.

The most common type of mouse is the optical mouse which uses an internal sensor or laser to detect the mouse's movement. The conventional mouse used before the optical mouse had a roller ball at the bottom which controlled the movement of the mouse. Another type of mouse used is the trackball mouse which is a traditional mouse but the rollerball is at the top or at the side of the mouse.

Digital images are entered into the computer using devices like the digital camera, webcams and camcorders. Digital camera captures still images which may be used in the computer. Webcams are capable of capturing live video and transfer it directly to the computer

Sound can be captured using a microphone. Most computers are equipped with a microphone. Generally there are two types of microphones- a) unidirectional microphones which pick up sound only from one direction and b) omnidirectional microphones which pick up sound from all directions.

Output Devices

Output devices help to send processed data out of a computer. The major output devices are monitors, printers, speakers etc.

The most popularly used monitors are the Cathode ray tube (CRT) monitor, Liquid crystal display(LCD) monitor, Light emission diode(LED) monitor etc. The CRT monitor occupies more space than the other two but the picture clarity and colour accuracy is comparatively high. The LCD and the LED monitors are energy efficient and emit lesser electromagnetic radiation.

Printers are generally of two types, impact printers and non impact printers. Impact printers have tiny keys that strike the paper through an ink ribbon to create an impression. An example of impact printer is the dot matrix printer. Non impact printers use laser beams or spray ink to obtain the prints. Examples of non impact printers are the laser printers and the ink jet printers.

Central processing Unit

The central processing unit, or CPU, is that part of a computer which executes software program instructions. The motherboard is the primary circuit board within a personal computer. Many other components connect directly or indirectly to the motherboard. Motherboards usually contain one or more CPUs, supporting circuitry – usually integrated circuits (ICs) - providing the interface between the CPU memory and input/output peripheral circuits and main memory.A PC's main memory is fast storage that is directly accessible by the CPU, and is used to store the currently executing program and immediately needed data. Main memory is much faster than mass storage devices like hard disks or optical discs, but is usually volatile, meaning it does not retain its contents (instructions or data) in the absence of power. In Secondary memory, Mass storage devices store programs and data even when the power is off; they do require power to perform read and write functions

Ports

Port is a connecting socket, outside the system into which different types of cables are plugged. It is a specific place from which other devices can be physically connected. I/O ports are the interfaces through which computers communicate with external devices such as printers, modems, joysticks and terminals. The different types of ports are parallel ports, serial ports and Universal Serial Bus (USB) ports

Various peripherals can be connected through parallel port, which is a parallel communication physical interface. A parallel port transmits 8 bits of a byte of data in parallel. It is used for transmitting fast data over short distances. It is used to connect a printer to a computer.

Serial port transmits one bit of a byte, one at a time as a single stream of bits. It is meant for transmitting slow data over long distances. Communication over a phone is an example of serial communication. It is a serial communication physical interface which transmits one bit at a time. Dial-up modems and serial mice use serial ports.

A USB Port can connect up to 127 peripheral devices such as a digital camera, digital speakers, scanners, speakers etc. It permits *Plug and Play* – configuring of expansion cards and peripheral devices as and when they are installed.

Software

Computer software is a collection of computer programs that perform some tasks on a computer system. Software applications for word processing, Internet browsing, Internet faxing, multimedia playback, computer game play and computer programming are common. Software can be broadly categorized as system software, application software and utility software. System software is set of programs which are used to run the system. System software manages all the other resources of the computer. It controls all the operations of the computer. An important system software required to work any computer system is Operating System. Application software is the set of programs necessary to carry out operations for a specified application. These are programs written by programmers to enable computer to perform a specific task such as accounting, billing or any such type of applications in real life. These software are user-oriented applications. Utility programs help out a user for system maintenance and performing routine tasks. Generally utilities are included with the operating systems. They are specialised programs capable of doing a particular type of tasks. Some of the common tasks of utility software are:

- Formatting of drives
- Scanning system for viruses
- Checking the free space available in a memory
- Checking the free space available in hard disk
- Searching files
- Taking backup of files

Major operating systems

All computers need some sort of hardware platform to run the software. These platforms are called Operating System (OS). Operating system is a program that acts as an interface between user of computer and the computer hardware. The purpose of an operating system is to provide an environment in which user can execute program in a convenient and efficient manner. An operating system (OS) manages computer resources and provides programmers with an interface used to access those resources. Common Operating systems are Microsoft Windows, Linux etc.

Operating system is an important part of almost every computer system. It manages all resources of computer system. Operating system is installed in secondary memory, while it's some part are stored permanently in read only memory. Some part of the operating system resides in random access memory and the computer begins to execute this part of the system. The majority of modern home computers use some form of Microsoft's operating systems. The original Microsoft operating system was called DOS (Disk Operating System) though most computers use Windows. Windows comes in various versions. A few computers use IBM's O/S2. Apple's Mac use their own operating. Some computer professionals, Internet Service Providers (ISP) and mainframe computer users use an operating system such as UNIX or server based operating systems. The operating system controls the input and output or directs the flow of information to and from the CPU. Much of this is done automatically by the system. In short, we can say that an Operating System is one of the most important components of the computer software which is essential to operate a computer.

Application Softwares

Media Player is one of the common examples of application software. It is an application which is used to play multimedia files. Most of the media players can play both audio and video files. Media library is a common part of almost all media players which contains available songs. It is generally used to watch movies and listen to music on the computer. Calculator is an application software provided by windows operating system. It is an application which is used to perform simple mathematical operations which can be performed by a normal digital calculator.

Some of the common application softwares which are used by a common PC user are

- Word Processor
- Spreadsheet
- Presentation software
- Graphics software
- Computer games/Entertainment software
- Accounting software

DOS and Windows

The original operating system of Microsoft was called Disc Operating System (DOS). Later on the much popular windows operating system was developed. Windows has many versions like the Windows XP. Windows 2000, Windows Vista, Windows 7 etc.

Uses of MS Word

The application software is used to create general documents. It is used to create as well as edit text documents. It is easy to make corrections in the word processing software

Uses of MS Excel

Excel or spreadsheet software has made calculations and numerical analysis easy. It can be used to perform any type of calculation. The software is also used to plot graphs and charts. It may be used to compare data and also for financial analysis.

Uses of MS PowerPoint

PowerPoint which is presentation software makes presentations easy. It is easy to incorporate pictures, charts, diagrams, graphs etc in the presentation using this software. it helps to make presentations visually appealing.

Uses of SPSS

SPSS is statistical software which makes statistical analysis easy. For the same reason, the software finds application in the field of research.

Open access initiatives and free software movement

Free software license is a matter of users' freedom to run, copy, distribute, study, change and improve the software. It means the freedom to run the program, for any purpose by any kind of person or organization, any kind of computer system for any kind of job without being required to notify any specific entity. It also includes the freedom to study how the program works, and adapt it to your needs. Free software also enables to make modifications and use the programmes privately. The Free Software Foundation was founded in 1985 and Richard Stallmann is the key figure behind the movement. The foundation promotes the development and use of free software. The simplest way to make a programme free software is to put it in public domain.

Open access initiative is a non-profit corporation dedicated to manage and promote the Open Source Definition. According to the Open source definition, license of a programme must not be specific to a product and the license must not restrict any other product. The open access initiative ensures free distribution of the source code of software.

An important open source operating system is the LINUX. The programme began in1991. Since then it has been modified by various programmers. Being an open source operating system, LINUX is found to be stable and not subject to crashes. Free versions of LINUX can be downloaded and be used and modified by anyone. Some of the most common versions of LINUX are Fedora, Ubuntu, SUSE etc.

The concept of Copyleft is relevant in the context of open access initiatives. It is a notice giving the public legal permission to redistribute a programme. In copyleft, the software is first copyrighted. Then legal distribution terms are added to it so that the software is freely available to the public. Open access initiative and free software movement is a noteworthy attempt to resist the monopoly of certain specific groups in the field of computer software.

MODULE II

KNOWLEDGE SKILL FOR HIGHER EDUCATION

Data is unprocessed facts and figures without any added interpretation or analysis. Information is data that has been interpreted so that it has meaning for the user. Knowledge is a combination of information, experience and insight that may benefit the individual or the organisation. Data is the lowest level of abstraction, information is the next level, and finally, knowledge is the highest level among all three.

Digital data has become one of the most important form of data storage in todays world. Extracting information from such repositories has become one of the most important area getting attention of computer science researchers. Digital data repositories include databases, digital libraries and most important, web documents. All these can be accessed from anywhere in the world through the internet.

Internet as a knowledge repository

Internet is the backbone of modern communication system. In today's life, we are dependent on the internet for almost everything from information collection to carry out various activities such as online shopping and education. Internet is a collection of computers world over connected together to share various resources.

The Internet is a global network of computer networks utilizing a suite of protocols called TCP/IP (Transmission Control Protocol/Internet Protocol) that supports interconnection of a number of different computer networks. The Internet covers large, international Wide Area Networks (WAN's) as well as smaller Local Area Networks (LAN's) and individual computers connected to the Internet worldwide.

There are various ways to connect an internet. Generally dial-up connection and broadband connection are the two types of internet connections which are used commonly. It is a way to connect to the internet in which public switched telephone network (PSTN) is used to make a Internet connection via telephone lines to an internet service provider (ISP). In dial-up connection telephone network is of prime importance. Since dial-up connection requires telephone lines which have limited capacity, its transmission speed is limited and is slow. A MODEM is required for dial-up internet connection. MODEM is short form of modulator-demodulator. A modem is a hardware device or a software application program that is used in a computer to transmit data over a network. In computer information is stored in digital form whereas information transmitted over telephone lines is transmitted in the form of analog signal. A modem is used to convert between these two forms of analog to digital and vice versa. Now-a-days, dial-up connections are gradually being replaced by Broadband connections. Broadband Connection is a high data rate connection as compared to dial-up connection. Broadband has very high rate of data transmission. In contrast to dialup connection, it is a permanent connection, which can be set up over a high-speed communication links. Multimedia applications such as video and computer games, can be downloaded very quickly and easily with broadband connection.

History of the internet can be traced to ARPNET, an initiative by the US to maintain their strategeic lead over the Soviet Union in arms race. The ARPNET which went live in October 1969 was based on a protocol NCP(Network Control Program). It was later replaced by TCP/IP (Transmission Control Protocol/ Internet Protocol) in 1983, which quickly became the most widely used protocol in the world. Most prominent aspect of TCP/IP was a mechanism of assigning a unique identification number to a computer(known as host) connected to a network known as the IP adress which is 32 bit number, the IP addresses being partitioned into different classes. Gradually applications which run on theses protocol began to emerge. These include, telnet, ftp, mail, etc. Telnet was a simple application, which run on TCP/IP stack by which a user can log on to a remote computer, by specifying the IP adress. Similarly ftp protocol allowed file transfer using the TCP/IP protocol suite.

World Wide Web

The World Wide Web is a service provided over the internet to access necessary information. Many people use the terms the World Wide Web and the Internet as synonyms. This is largely due to the fact that the World Wide Web has increased the popularity of the Internet. More people are logging on every day. There are thousands of web sites, many of which contain valuable information, others provide entertainment, and others are completely useless. All web sites have addresses so that they are easy to locate. Web addresses are called URLs, which stands for Uniform Resource Locator. Invented in 1991 by Tim Berners-Lee, the web is the fastest-growing Internet service.

Search engines

A search engine is essentially a web site that allows to search all of the information on the World Wide Web. Some keywords that we would like to find is entered and it returns a list of pages that contain those keywords. A search engine has three parts. The first part is a programme called spider which constantly collects data on the web. The second part of the search engine is an indexer programme which organizes the data into a database. The third part is the search engine software which makes available the required information.

There are two kinds of search engines on the web based on the way that web pages are indexed. The way that a search engine works is that most of the web sites on the web are indexed according to keywords and categories, when you search for these keywords and categories the result is a list of all the sites in that category. Yahoo is one of the most popular search engines. It differs from most others because people index all of the web sites. Yahoo has a lot of people working for them, surfing the web and categorizing each web site they come across. Because of this Yahoo searches tend to be more accurate but they do not always find everything. The second type of search engine does not use people to index pages. Instead they use a program that "crawls" from one web site to another indexing all of the words on a site. An example of this is the Altavista search engine. Another popular search engine is the Google. Almost all required information is available on these search engines

The traditional web content can only be viewed by the user and cannot be modified. But the wiki websites not only provide information to the user but also allws the user to modify or contribute to the existing information. The popular online encyclopedia, Wikipedia is one such website. Wikipedia is a revolutionary effort in the field of digital information. it provides opportunities to the user to contribute, modify, edit and even comment on the available information. Wikipedia is a multilingual, Web-based, free-content encyclopedia project. Wikipedia's articles provide links to guide the user to related pages with additional information. Wikipedia is written collaboratively by volunteers from all around the world. Anyone with internet access can make changes toWikipedia articles. Since its creation in 2001,Wikipedia has grown rapidly into one of the largest reference web sites.

Academic search techniques

The features which are useful in academic search are the favourites and the bookmarks. When a webpage is marked as favourite or bookmarked, it makes it easy to return to the webpage as required. Most browsers also provide the feature of folders to save the desired files. Often there are subject directories which organize the information into specific subjects and sub topics. It is much more easier to search through a subject directory than a general database.

Use of IT in teaching

In the present society where computers form an integral part of our life, Information technology influences teaching to a great extent. Constant updation of knowledge is possible through online resources. Information technology has infact revolutionized the process of teaching. Virtual classrooms that connect the teacher with the student across physical space is now a reality. An example of virtual classrooms is the one conducted by IGNOU. Internet and World Wide Web has made it possible to study any course from anywhere in the world through online facilities. Academic services, search engines and all support the process of education.

Academic services

MIT Open CourseWare

MIT Open CourseWare (MIT OCW) is an initiative of the Massachusetts Institute of Technology (MIT) to put all of the educational materials from its undergraduate- and graduate-level courses online, partly free and openly available to anyone, anywhere, by the end of the year 2007. MIT Open CourseWare can be considered as a large-scale, web-based publication of MIT course materials.

INFLIBNET

University Grants Commission has launched an ambitious programme to bring about a qualitative change in the academic infrastructure, especially for higher education. Under this initiative UGC is modernizing the university campuses with state-of-the-art campus wide networks and setting up its own nationwide communication network named UGC-Infonet. INLFIBNET is responsible for execution and monitoring the entire project w.e.f Jan, 2003. Information and Library Network (INFLIBNET) is a virtual network of libraries of different academic institutions. it was devised to create a database of resources to be made available to the academic community. Inflibnet promote computerisation of libraries, provides access to a large database as well as promotes sharing of digital content.

NICNET

National Informatics center Network (NICNET) is a networking infrastructure built by the National Informatics Centre to provide networking for e-governance. NICNET serves 35 states and union territories, 53 central government departments and more than 600 district centres. It also provides services like video conferencing, database access, information broadcasting etc.

BRNET

Bio Resource Network (BRNET) is a collection of biological resources distributed over the internet. It is an initiative of the Japan Science and technology Corporation. It brings together the biological information scattered over networks. It categorises information so that it is easily available to people.

Basic concepts of IPR

Superficially it may appear that a book in digital format available through any media are nothing but presentation of the underlying document. But it brings out a lot of issues which were not there in the era of printed books. A document once stored in a digital form can be easily copied at no cost or marginal cost, easily modified and easily transmitted. This has actually opened up new avenues for academic publishing, including text books, research papers, technical reports. But the existing Intellectual Property rights are to be reinterpreted in the new context.

Intellectual property rights are a bundle of exclusive rights over creations of the mind, both artistic and commercial. The former is covered by copyright laws, which protect creative works, such as books, movies, music, paintings, photographs, and software, and give the copyright holder exclusive right to control reproduction or adaptation of such works for a certain period of time. Intellectual property rights include patents, copyrights and trademarks.

Copy rights and Patents

Copyright gives the author of an original work exclusive right for a certain time period in relation to that work, including its publication, distribution and adaptation, after which time the work is said to enter the public domain

A patent is a set of exclusive rights granted by a state to an inventor or his assignee for a limited period of time in exchange for a disclosure of an invention.Only non obvious ideas can be patented.

A Trademark is a distinctive sign or indicator used by an individual, business

organization, or other legal entity to identify that the products or services to consumers with which the trademark appears originate from a unique source, and to distinguish its products or services from those of other entities.

Internet plagiarism

Plagiarism means claiming another person's words as one's own. Copying the materials published on the internet as one's own without proper acknowledgement is called Internet Plagiarism. To avoid plagiarism quote the words which are used and properly credit them with details of the author and other bibliographic details.

MODULE III
SOCIAL INFORMATICS

Relevance of informatics in society

We live in an exciting time in history. The widespread availability of computers and internet connections provides lot of opportunities to communicate and learn. Unfortunately, although most people use the internet as a powerful and beneficial tool for communication and education, some individuals exploit the power of the internet for criminal or terrorist purposes.

There are many unique challenges we face in this age of information. They come from the nature of information itself. Information is the means through which the mind expands and increases its capacity to achieve its goals, often as the result of an input from another mind. Thus information forms the intellectual capital from which human beings Shape their lives and secure dignity.

The history of human race has undergone great changes in tune with technological development. A new invention leads to great changes in the living style of the people. Man has become a superior member of the animal kingdom because of his capability to invent new things. Today we are in the midst of an information revolution as a result of the invention of computers. The wide spread use of computers has substantially increased our ability to compute and communicate. The complex interrelation between technological and institutional changes associated with information technology has significant implications for the way. It will affect the societies and economies of developing countries

The present century is widely known as "information era". It has revolutionized the media and modes of computing, storing and communicating information, man's infinite capacity for invention and desire for discovery, exploration and research has lead to rapid growth of technologies and there by information technology. Information explosion has created problems for proper processing and dissemination of information, which can only be solved with the aid of this information technology

Information technology in education has tremendously increased because of it provides enhanced satisfaction, caused effectiveness, faster and simpler programmes, rapid responses and easier operational procedures. Information technology Is an important and extremely effective tool through which development and progress can take place with the cooperation of all strata of society including government and the public

Information had become central to every aspect of life as it defines social and political relations as it underpins decisions at all levels and in all affairs of human society. The volume of information available to an average individual today is mind boggling but what is more amazing is the technology or technologies that drive the generation, processing storage, dissemination of information as we have today. It becomes necessary to consider what these technologies are, what they portend for the future of information generation, processing, storage and dissemination in developing countries in particular and the world at large. It is also necessary to consider the emerging trends in information and communication technologies.

Today the life of man has been dramatically changing purely because of powerful machines called computer. Every where we go, what ever we do, we can see the amazing things that the computer has been doing for us from the time we wake up, go to school or our offices, then back to our homes for end of day activities we make use of machines powered by computers.

Computers have changed societies in many ways. Computers are one of the supreme and best inventions ever made in the history of modern technology. It has brought numerous and countless advances to many different fields of studies as well as in the lives of many people. Today computers have changed how people work and have opened new methods and means of acquiring new knowledge and skills. Computers are now being used in various fields from education to medicine, business, government, science, publishing and industry.

Social Cybernetics

The term "Cybernetics" comes from a Greek word meaning "the art of steering". Cybernetics is about having a goal and taking action to achieve that goal. In modern times, the term became widespread because Norbert Wiener wrote a book called "Cybernetics" in 1948.

The science of behavior cybernetics as a closed-loop, self governed process social cybernetics focuses upon the reciprocal feedback interactions between two or more individuals in a group or organizational setting. Human computer interaction also can be characterized as a social Cybernetic process.

The basic ideas of a 'learning community' is that of a group with a common dedication to a culture of learning in which everyone involved in a collective effort of understanding. In an online learning community, interaction among members of the community occurs not in physical space (the traditional Classroom) but in virtual space, through medication of an intelligent 'agent' (computer software) responsible to facilitating such interaction

The Scientific approach advocated here to analysis of interactive systems of this sort, involving multiple human-human and human- computer relationships, is grounded in social cybernetics. Social cybernetics is founded on the brooder field of behavioral cybernetics, which assumes that human behavior is controlled as a closed-loop of cybernetic process. The cybernetic nature of behavior becomes obvious during social interaction between two or more individuals. This is because each individual in a social context must control the sensory feed back created by interacting with one or more social participants.

Information Society

The aim of the information society is to gain competitive advantage internationally through using it in a creative and productive way. An information society is a society in which the creation, distribution, diffusion, uses, integration and manipulation of information is a significant economic, political and cultural activity. The knowledge economy is its economic counterpart where by wealth is created through the economic exploitation of understanding. People that have the means to partake in this form of society are sometimes called digital citizens. Information society is seen as the successor to industrial society. Closely related concepts are post-industrial society (Daniel Bell), Post-fordism, Post-modern Society, knowledge society, Telematic society, Information Revolution, Liquid Modernity and Network Society.

There is currently no universally accepted concept of what exactly can be termed information society and what shall rather not so be termed. Most theoreticians agree that a transformation can be seen that started somewhere between the 1970s and today and is changing the way societies work fundamentally. Information technology is not only internet, and there are discussions about how big the influence of specific media or specific modes of production really is.

Some people, such as Antonio Negri, Characterized the information society as on in which people do immaterial labor. By this, they appear to refer to the production of knowledge or cultural artifacts. One problem with this model is that the material and essentially industrial basis of the societies.

The information revolution and the application of information and communication technologies are fundamental in conceptualizing information society. The concept of the information society is defined through various perspectives. The European Union High-Level expert group report of 1997, defines information Society as; the society that is currently being put in place, where low –cost information and data storage and transmission technologies are in general use. The generalization of information and data use is accompanied by organization, commercial, social and legal innovations that will profoundly change life both in the world of work and in society generally.

Information Society refers to a situation where information and communication technologies are integrated in industrial production and information dissemination in all fields. Technology instigates a new approach to the production, distribution and consumption of information. Information society refers to a situation where information becomes a source of income generation, where employment found mostly in the information sector.

Information society embodies the utilization of the information in the creation of knowledge. Dennis Mac Quail (1997:87) comments that the information society is noted is; Society which makes extensive use of information networks (meaning systems of IT hardware and services which provide users with delivery and retrieval services in a given area, eg. electronic mail, directories and video services) and IT (Information Technology meaning the hard ware, software and methods used for the automatic processing and transfer of data and skills needed to use them), produce large quantities of information and communication products and services, and has a diversified content industry.

Cyber Ethics

We live in an exciting technological era in history. The widespread availability of computers and internet connections provides unlimited opportunities to communicate and learn. However, when most people use internet as a powerful and beneficial tool for communication and education, some individuals exploit the power as the internet for criminal or terrorist purposes. There is a vast range of ethical issues surrounding technology.

Technology is all around us and affects almost every aspect of our daily lives. Because technology moves faster than ruler can be formulated to govern it, how technology is used is left up to the individual with the guidance of their personal ethics. In both good and bad ways, technology affects our community life, family life, work environment, education and medical research, to name only a few areas of our lives.

Technology constantly challenges our ethics as individual and as a society. In the rest of this technology in focus feature, we will explore the different relationships between technology and ethics. Specifically, we present different viewpoints of situations with regard to social justice, intellectual property (fair use), privacy, e-commerce (online gambling), electronic communication issues (free speech), and computer abuse (protection versus access) in which ethics and technology impact each other.

The term "cyber ethics" refers to code of safe and responsible behavior for the Internet community. Practicing good cyber ethics involve understanding the risk of harmful and illegal behavior online and learning how to protect ourselves, and other internet users, from such behavior. It also involves teaching young people, who may not realize the potential for harm to themselves and others, how to use the Internet safely and responsibly.

While we are discussing about ethical issues, it is necessary to examine what is ethics. Ethics we can define as a rational process founded on certain principles. According to the ethical theory that existed in ancient Greece, ethics was the study of what was good for both the individual and society. Cyber ethics is quiet simply the study of ethics on the internet. Cyber ethics is often called as information system Ethics. Information system ethics can be defined as "The study of moral, legal, ethical issues involving the use of Information and communication technologies" (Koroth 155).

Loosely defined, ethics is a system of moral principles, rules and accepted standards of conduct. The computer Ethics Institute developed the Ten Commandments of computer Ethics, which is widely cited as a benchmark for companies that are developing computer usage and compliance policies for employees .Ethical computing Guidelines listed below are based the computer Ethics Institute's work:

Ethical computing guidelines

1. Avoid causing harm to others when using computers
2. Do not interfere with other people's efforts at accomplishing work with computers
3. Resist the temptation to snoop in other people's computer files
4. Do not use computers to commit theft
5. Agree not to use computer to promote lies
6. Do not use software (or make illegal copies for other) with out paying the creator for it
7. Avoid using other people's computer resources without appropriate authorization or proper compensation.
8. Do not claim other people's intellectual output as your own
9. Consider the social consequences of the products of your computer labor
10. Only use computers in ways that show consideration and respect for others.

The concern over computer ethics increases due to the large volume of data available to individuals and organizations. No firm can ignore the opportunity to take advantage of the wealth of data and data manipulation provided by modern information technologies and telecommunications. The competitive nature of the economy compels organization to take advantage of the modern technology in order to beat competitors. Therefore, the remedy is to devise ethical principles that allow for the greatest level of innovation and competitive strategy. Likewise, business needs to develop codes of ethics to protect their information system safe.

E-commerce, in particular, creates a host of new ethical considerations, particularly in the area of marketing. The level of personal information and detail that can be collected about an individual raises some serious questions about individuals' rights to personal information in the digital world. The easy collection and exchange of personal consumption patterns and interests over the internet makes people uncomfortable. More broadly, those concerned with computer ethics ask to what extent information perceived as a public good ought to be transformed into a marketable commodity (koroth 155)

Of Course, computer activity that is legal need not be ethical. For example, the invasion or employee privacy via the monitoring of computer-based communications and other.

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Of course, computer activity that is legal need not be ethical. For example, the invasion or employee privacy via the monitoring of computer-based communications and other   computer activity, while generally regarded as legal, they raise serious ethical dilemmas. In addition computer and related technology greatly depersonalize information and communication and allow for enhanced anonymity, which in turn can lead to less restriction to unethical behavior.

Information technology and computer professionals began seriously considering the long term effects of computer ethics in the late 1980s and early 1990s. They recognized the need to organize professionally through some bodies to devise professional codes of conduct. However, the increasing spread of powerful computers in the hands of non-professionals widens the scope of potential problems. Information system ethics tries to explore and evaluates some important aspects regarding information field. They are the development of moral values in the information field, the creation of new power structures in the information field and information myths, hidden contradictions and intentionality's in information theories and practices, and the development of ethical conflicts in the information field etc.

Issues like collection of private data of the users using internet by monitoring the traffic is strongly related to one's policy as that information can be further used for illegal purposes. These types of privacy issues are needed to be addressed properly so that they should not exploit one's freedom. One reason that topics such as online gambling and pornography have become such firestorms of controversy in cyberspace is the simple fact that so many people have access to the web sites. With this another issue "censorship" comes which should be deal in efficient way as it is not is to implement

Ethical, social and political issues concerning the information technologies can be examined in terms of the five moral dimensions. They are, Information Rights and obligations, Intellectual Property Rights, Accountability and Control with respect to Information System, System Quality and Quality of life. A serious issue has to be addressed is to ensure the standards of data and system quality to protect rights of individuals and society. And the values required to be projected in an information and knowledge based society is another major ethical dimensions of information system.

Ethical issues are old as human civilization. These issues are not the product of information technology. It was existed here before and still it remains a major concern of all free societies of the world. Information technology has augmented ethical distress, put stress on existing social arrangements and made existing laws obsolete or severely crippled. Ethical issues in information technology arise mainly due to the reasons like, development in computer capability, low storage cost, advanced data mining, popularities of internet etc.

The development of global digital super high way communication networks widely available to individuals and business poses many ethical and social concerns. It also breaks the traditional relationship between family, work, leisure etc. The wide spread availability of computers and internet connections provide unprecedented opportunities to communicate and learn. Unfortunately, although most people use the internet as a powerful and beneficial tool, for communication and education, some individuals exploit internet for criminal or terrorist purpose.

The more dramatic abuse of computer technology such as major internet hacking of company websites and online theft of credit card numbers achieve much attention. Most cases are more delicate frequent and attached to the every day working of ordinary law abiding citizens. There are only few clear rules to govern ethical computer behavior and many new situations arise with great frequency, which can prove dangerous especially when these are related with business and sensitive information.

Impact of IT on social interactions

The internet and technology has really changed the way that people interact with each other. The instant nature of e-mail, social media networks and video chat programs allow people from all over the world to stay in constant contact with each other. Through the use of these websites and computer programs it allows technologies to have a major impact on various social interactions

One of the first types of impact that technology has on social interactions is that it allows people to stay in contact with each other. In the days of mail, snail mail and telegraphs it would often take days or weeks to hear news about friends and family members. Nowadays with social media, text messaging and e-mail news and information arrive to friends and family in a matter of minutes. This instant connectivity allows people to feel closer to friends and family members. The internet also allows people to reconnect with long lost loved ones or old friends. Running a simple Google search will allow people to be able to reconnect with each other after a long absence.

A second impact that technology has on social interactions is that it allows groups of like minded people to gather together. The internet allows groups of people with similar interests to gather together regardless of where they live in the world. Websites like MySpace, face book and Twitter allow anyone to create a group for others to join that talk about a number of interests. These groups can share information, talk about interests and really explore their interests, because they all have a common theme. Without these websites these people would never be able gather together and find likeminded people. E-groups, Virtual communities, and blogging are considered the three powerful modes of social interactions through internet.

Electronic groups (E-groups)

E-groups.com was an email list management website. The site allowed users to create their own mailing lists and allowed others to sign up for membership on the list. The website provided archives of the messages as well as list management functionality. Each group also had a shared calendar, file space, group chat and a simple database.

When a computer network connects people, it is social network. Just as a computer network is a set of machines connected by a set of cables, a social network is a set of people connected by a set of socially-meaningful relationships. Social network analysis conceives of social structure as the patterned organization of these network members and their relationships

Electronic groups are online work areas for peoples to collaborate on some shared task. The group areas are typically private so that only members of the assigned team can access the work area. In the electronic group area, each team member is displayed with a quick e-mail link. Group features are then provided private discussion boards and chat rooms to communicate with team members about a project, and file exchange boxes to share working documents. E-group is a computer based communication technology, specifically electronic group mail, might affect group behavior in organizations. It proposes a framework for analyzing groups formed by electronic distribution lists. The e-group at work is a new social phenomenon that may contribute importantly to organizational behavior.

Virtual Communities

A virtual community is a social network of individuals who interact through specific media, potentially crossing geographical and political boundaries in order to pursue mutual interests or goals. One of the most pervasive types of virtual community includes social networking services, which consists of various online communities. The term virtual community is attributed to the book of the same title by Howard Rheingold, published in 1993. The book, which could be considered a social enquiry, putting the research in the social sciences, discussed computer –mediated communication and social groups, broadening it to information science. The technology included Usenet, MUDs (Multi -User Dungeon) and other derivatives MUSHes (Multi User Shared Hallucination) and MOOs, Internet Relay Chat (IRC), Chat Rooms and electronic mailing lists, the World Wide Web as we know it today was not yet used by many people. Rheingold pointed out the potential benefits for personal psychological well being, as well as for society at large, of belonging to such a group.

These virtual communities all encourage interaction, sometimes focusing around a particular interest, or sometimes just to communicate. Quality virtual communities do both. They allow users to interact over a shared passion, whether be through message boards, chat rooms, social networking sites or virtual worlds.

Blogging

A blog is a type of website or part of a website supposed to be updated with new content from time to time. Blogs are usually maintained by an individual with regular entries of commentary, descriptions of events or other materials such as graphics or video. Entries are commonly displayed in reverse chronological order. Blog can also be used as a verb, meaning to maintain or add content to a blog.

Although not a must, but most good quality blogs are interactive, allowing visitors to leave comments and even message each other via widgets on the blogs and it is this interactivity that distinguishes them from other static websites.

Many blogs provide commentary on a particular subject; others function as more personal online diaries; yet still other function more as online brand advertising of a particular individual or company. A typical blog combines text, images and links to other blogs, web pages, and other media related to its topic. The ability of 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 (art blog), Photography (Photo blog), videos (video blogging or vlogging), music (MP3 blog) and audio (Pod casting). Micro blogging is another type of blogging, featuring very short posts.

The term weblog was coined by Jorn Barger on 17 Dec 1997. The short for "blog" was coined by Peter Merholz, who jokingly broke the word weblog into the phrase we blog in the side bar on his blog peterme.com in April or May 1999. The modern blog evolved from the online diary, where people would keep a running account of their personal lives.

Early blogs were simply manually updated components of common websites. However the evolution of tools to facilitate the production and maintenance of web articles posted in reverse chronological order made the publishing process feasible to a much larger, less technical population. Ultimately, this resulted in the distinct class of online publishing that produces blogs we recognize today. For instance, the use of some sort of browser based software is now typical aspect of "blogging".

IT and Social Development

Information Technology (IT) is a branch of engineering that focuses on the use of computers and its related technologies for automation and other purposes. It is the study of design and implementation of IT resources for promoting innovation and enhancing work efficiency. Internet is one of the main breakthroughs of IT that has revolutionized the lives of human beings all across the globe. Internet has made instant communication feasible on a world wide scale. It has also changed the conventional methods of banking, healthcare, agriculture, education etc. Thus the impact of IT is considered to be far more pivotal than other technological breakthroughs like television and radio.

In the last few years, India has witnessed a massive growth in the IT sector. India's IT workforce is considered to be one of the best in the world. IT has also had a strong impact on the way governance is done in India. A number of e-governance initiatives have ensured that governance reaches to the masses in the most cost and time efficient manner.

With the rise of portable computing devices, the idea of ubiquitous networking has been generating a lot of interest. Ubiquity in computing essentially means being able to access and exchange information whenever you happen to be and having the key information that you need accessible when you need it. Thus industry provides numerous new opportunities as the present era.

The CPU which is the "brain" of the computer is an important little chip which helps the computer process information. The innovations of the transistor and the integrated circuit have shrunk the processor so much that even a pen sized instrument can house computer processing capabilities. Miniaturization has made technology very much a part of our lives.

Computer technology also changing the face of medicine. Computers are no longer just for gaming and spread sheets. Microprocessors, nanotechnology and other technologies developed during the personal computing explosion of the last two decades are rapidly being adapted to the medical field. Aside from the surgical robotic techniques and patient simulators people can look forward to the appearance of the many medical advancements within the next decade such as; mechanisms delivering drugs, chips that let you forget to take your pills, invasive medical procedures, computers monitoring your body functions etc.

Nano Science and Nano Technology would allow us to create Microscopic computers the ultimate in portable devices. This will help to carrying with us a supercomputer the size of pencil eraser or even better having the power of a desktop computer implanted in our body as a nano-sized chip.

Information technology (IT) has opened a breakthrough of technological innovation in collecting, storing, processing, transmission and presentation of Information. It has not only transformed the information technology sector itself into a highly dynamic and expanding field of activity and creating new markets and generating new investments, income and jobs. It also provided other sectors with more rapid and efficient changes in demand patterns and changes in international comparative advantages through more efficient production process and new and improved products and service. For example, IT replaced mechanical and electromechanical components and upgrading traditional products by creating new product functions, incorporating skills and functions into equipment, automating routine work, making technical, professional or financial services more robust.

The development of IT is closely connected with the greater developments recently accomplished in micro electronics. Based on scientific and technological breakthroughs in transistors, semi conductors and integrated circuits, micro electronics is affecting every other branch of economy, in terms of both its present and future employment and skill requirement and its future market prospects. Its introduction has resulted in a drastic fall in costs as well as dramatically improved technical performance both within the electronic industry and outside it.

The continuous rise in the number of features on a single microelectronic chip has permitted lower assembly cost for electronic equipment, faster switching speed, and more reliable, smaller and lighter equipment. Similar spectacular falls in costs occurred in the transport and steel industries and in energy sector. The potential effects of micro-electronics are thus very far reaching, for its use in production saves on virtually all inputs, ranging from skilled and unskilled labor to energy, materials and capital.

All sectors of the economy have been influenced by the development of IT applications. Information technology opens up greater opportunities for the exploitation of economies of scale and scope, allows the more flexible production and use of labor and equipment, and promotes the globalization of production and markets. It offers greater mobility and flexibility in capital and financial flows and services, and is frequently the precondition for the creation of innovating financial instruments. Information system developments are constantly being applied to increase the productivity, quality and efficiency of finance, banking, business management and public administration.

In manufacturing, and to some extent in agriculture, many processes have been automated, some requiring highly flexible, self regulating machines or robots. The engineering industry has been transformed by computer aided design and three dimensional computers screen displays.

World markets for the consumption of goods are growing. The advance of telecommunications and computerization has recently enabled large companies to use information system to transmit technical and economic information among numerous computer systems at different geographical locations, enabling widely dispersed industrial plants to direct managerial control from a central location. This affects the international division of labor and production and international trade, changing the pattern of industrial ownership and control, altering the competitive standing of individual countries, and creating new trading partners. Its real economic and social significance lies on the integration of functions that gives on information technology.

More than just a gradual and incremental technological evolution leading to improved ways of carrying out traditional manufacturing process; IT offers the opportunity for completely new ways of working through system integration. More technical advances are expected soon in the automation of telecommunications and the linkage of computers by data transmission that will enhance the possibilities of systems integration.

Information technology is a new technological system in which far- reaching changes in the routes of electronic, computer and telecommunication technologies converge and offer a range of new technological options to virtually all branches of the economy. More over IT forms the basis for reorganization of industrial society and the core of the emerging techno- economic paradigm.

Reference

Evans, Alen….etal, 2010, *Informatics: Technology in Action,* Pearson.

Koroth, Abdul Assis, 2010, *General Informatics*, Calicut university Central Co-Operative store Ltd. No.4347, Calicut University

K. Ravindran Asari, 2010, *Informatics: Introduction*, Ane Books.

Mathew, Armand, *The Information Society*, London sage publications.

MODULE IV

MAJOR ISSUES RELATED TO INFORMATICS

Piracy Issues:

Through internet we can connect with literally hundreds of people on social networking sites like My space, Face Book or Twitter. Email, online chat and message boards allow for both public and anonymous communication about almost any topic imaginable, down to the smallest detail. We all enjoy the benefits of the internet, and for many it is an indispensible tool for work as well. At the same time many ethical things also exist within this cyber world. Pirating music and video is a valid example of unethical behavior.

Software piracy is any unauthorized use of computer software on the profit motive of human beings. It includes internet downloading- downloading of copy righted software from the internet without permission from the software copyright owner. Activities like unbundling- distributing or selling of the software that has been separated from the bundle, Renting- the rental of software to consumers without the permission of the copyright holder, counter felting- that is the making, distributing and selling the software copies that are fake soft loading- the purchase of a single user software license and loaded it to multiple computer for servers are come under software piracy.

Ethical Issues in Piracy

Technology is all around us and affects almost every aspect of our daily lives. Because technology moves faster than ruler can be formulated to govern it, how technology is used in left up to the individual with the guidance of their personal ethics. In both good and bad ways, technology affects our community life, family life, work environment, education and medical research, to name only a few areas in our lives.

Technology constantly challenges our ethics as individuals and as society. We present different viewpoints or situations with regard to social justice, intellectual property, privacy, e- commerce (online gambling), electronic communication issue (free speech) and computer abuse in which ethics and technology impact each other.

Software are the resources of the social institution in the modern techno world. The data related with political, economic, security etc are kept in software today. Since the hacking and interfering to others secrecy is done with high planning. However the international society is the one which could be called software society whose entire life and social interaction is on the one hand open to all and on the other hand inter connected with the other software. The agencies like Wiki leaks and CIA and many others are using the cyber world to get into the worlds of other illegally.

Software piracy is illegal because of the following reasons:

i. Software piracy is risky, stolen software can be infected with computed viruses.

ii. Software piracy is unproductive; software typically becomes outdated very quickly. Therefore innovations are always needed but pirated software are not getting the updation.

iii. Software piracy is wrong because this is some sort of stealing other's objects.

In the work place, piracy taken in two common forms, such as extra copies of software are made that employees take home and extra copies of software are made that employees take home and extra copies are made for the office.

Cyber Crime:

Cyber crime is the latest and perhaps the most complicated problem in the cyber world. Cyber crime may be said to be those species, of which, genus is the conventional crime, and where either the computer is an object or subject of the conduct constitution crime. Any criminal activity that uses a computer either as an instrumentality, target or a means for perpetuating further crimes comes within the ambit of cyber crime.

The concept of cyber crime is not radically different from the concept of conventional crime. Both include conduct whether act or omission, which cause breach of rules of law and counterbalanced by the sanction of state.

Crime is a social and economic phenomenon and is as old as the human society. Crime is legal concept and has the sanction of the law. Crime or an offence is a legal wrong that can be followed by criminal proceedings which may result into punishment. The hallmark of criminality is that, it is breach of the criminal law. A crime may be said to be any conduct accompanied by act or omission prohibited by law and consequential breach of which is visited by penal consequences.

A generalized definition of cyber crime may be "unlawful acts wherein the computer is a tool or target or both". The computer may be used by a tool in the following kinds of activity- financial crimes, sale of illegal articles, pornography, online gambling, intellectual property crime, forgery-mail spoofing, cyber defamation, cyber stalking. The computer may however be target for unlawful acts in the following cases- unauthorized access to computer / computer system/computer networks, theft of information contained in the electronic form, e-mail bombing, salami attacks, logic bombs, Trojan attacks, internet time thefts, web jacking, theft of computer system, physically damaging the computer system.(koroth,2010:158)

Cyber crime includes, computer crime, e-crime, high-tech crime which are referred to criminal activity where a computer network is the source, target, or place of a crime. Although the terms computer crime or cyber crime are more properly restricted to describing criminal activity in which computer is a necessary part of crime and these crimes are also used to traditional crimes such as theft, black mailing, fraud in which computers are used. Cyber crime can also be defined as any criminal activity involving an information technology infrastructure system. Popularly know cyber crimes are Hacking, Consumption of scarce resources, destruction or alteration of configuration or the computer, pornography, cyber terrorism, banking and credit card related crimes online gambling, identity theft, data changing, theft or internet hours misuse or computer devises, system interference etc.

Crimes on internet also increasing in a continuous manner. Computer crime is a general term that embraces such crimes as phishing, credit card frauds, bank robbery, industrial espionage, child porn, kidnapping children via chat rooms, scans, cyber terrorism, viruses, and spam and so on. All such crimes are computer related and facilitated crimes. Credit card fraud have grown in an increasingly manner. Leakage of military information from internet is another internet crime. Software known as Google earth, which shows information about different places including military land or can lead to robbery planning, is becoming an ethical issue around the world. Many people protest against this leakage of information but still one can't deny that it is one of the major enhancements in information technology.

The reality is that internet criminals are rarely caught. One reason is that hackers will use one computer in one country to hack another computer in another country. And those criminals are loosely organized groups- which security experts call "web gangs" conduct much is the illegal activity online. The structure of web gangs may be patterned on that of traditional organized crime, in which the members of the group may never come into contact with one another and many never be aware of who they are working for (koroth, 2010: 159)

Cyber criminals

The cyber criminals belong to different groups. This categorization has made on the basis of the object that they have in their mind in committing crime. Different types or cyber criminals are: children and adolescents between the age group of 6-18 years, organized hackers, professional hackers/ crackers and discontented employees. The curiosity to know and explore the things are the main reason of cyber criminality among children and adolescents while organized hacker are mostly organized together to fulfill certain objective, professional hackers are motivated by the attraction of money. The group of discontented employees includes those people who have been either sacked by their employer or are dissatisfied with their employer. To avenge they normally hack the system of their employee.

Mode and manner of committing cyber crime

Cyber criminals take many different activities to commit crime. Unauthorized access to computer systems or networks is normally referred as hacking in the generic sense. Another offense is theft of information contained in electronic form which includes information stored in computer hard discs, removable storage media etc. Email bombing is another mode or committing cyber crime which refers to sending large number of mail to the victim, which may be on individual or a company or even mail servers there by ultimately resulting in to crashing. Offences like Trojan attacks, virus, worm attacks, and web jacking also come under different modes of committing cyber crimes. . Internet time theft is another kind of thefts in which the internet surfing hours of the victim are used up by another person by gaining access to the login ID and the password. Logic bombs which are event dependent viruses and Salami attacks which are normally common in the financial institutions or for the purpose of committing financial crimes and data diddling which involves altering raw data just before a computer processes it and then changing it back after the processing is completed also counted as various manners of committed crimes. Denial of service attack refers the computer of the victim is flooded with more requests than it can handle which cause it to crash also a kind of manner of committed cyber crimes.

Cyber Security:

Before the advent of computers, valuable information of both business and non-business organizations was kept safely in paper records and files. However, information recorded and stored in computer files, as in the case of modern computerized information system, can easily be accessible to any number of people including outsiders. Hence, the data in computer files are more susceptible to destruction, fraud, error and misuse. A failure in the working of computers for few hours may cause serious damages and consequences to an organization. Since, information is a valuable asset, its security is all the more important than other kinds of tangible assets in the organizational context. Therefore it is highly essential to protect this valuable asset against loss, damage or disclosure.

Security refers to the policies, procedures and technical measures to prevent unauthorized access, alteration, theft or physical damage to information systems. The basic objective of information security in the protection of interests of those who depend on information from damages resulting from computer disasters.

Firewalls are software programs or hardware devices designed to keep computers safe from hackers. Firewalls specifically designed for home networks are called personal firewalls and are made to be easy to install. By using a personal firewall, we can close off open logical ports to invaders and potentially make our computer invisible to the other computers on the internet.

The main objective of information security can be stated as follows:

1. Availability objective – Information should be available and usable whenever it is required.
2. Confidentially Objective – This objective states that information should be available to only those who have the right to access it.
3. Integrity objective – As per this objective, information should be protected from unauthorized alteration and modification.

Security Issues

Data stored in electronic form faces number of threats than in manual form. These threats may take various forms such as technical, organizational and environmental factors along with poor management decisions. Development in information technology and communication techniques makes the problem more serious. Advancement in telecommunication system and networking help organizations to interconnect different computers installed at different geographical locations. Such interconnection facilities between the computers allow unauthorized access, abuse or fraud at any point in the network.

Moreover, highly complex and diversified hardware and software, organizational arrangement etc. also paved the way for manipulation of computerized information system. Internet the gigantic form of network creates some additional problems because it is exclusively designed to access easily by people from different computer systems.

Some of the major sources of threat to cyber security are; computer frauds, hacking, computer viruses, disaster, errors, maintenance problem, data quality problems etc.

Computer frauds are the main sources of threats by information system. Computer fraud may be defines as any unauthorized action by any person causing harm to information system. Unauthorized use, access, modification and destruction of computers hardware, software and data are come under the type of threat. Theft of money by altering computer records, theft of computer time and computer related assets, use of computer to commit an offence etc also involve in computer frauds.

By checking system security regularly, use of firewalls, by installing data encryption techniques to protect valuable information, by installing antivirus programmes, by applying strong controls in order to provide security to information system, by controlling core data, by awarding severe punishments to those who involved in computer fraud, by monitoring all programmes continuously, by using fraud detection software, by installing information system audit and by developing ethical standards and practices we can ensure the cyber security at an extend.

Cyber Laws:

Cyber laws comprise of a set of legal provisions to regulate the activities of the cyberspace or internet. The number of internet users has grown at an exponential rate over the past few years and as a result the number of cyber crimes has also increased. To ensure that there is a mechanism to protect the rights of internet users, cyber laws have been formulated. Apart from defining laws pertaining to cyber crimes, cyber laws are also meant to provide protection to the intellectual properties. In India, cyber laws have been defined under the IT Act, 2000, the provisions of which are revised from time to time depending upon requirements. India is a signatory to the Model Law and is under an obligation to revise its laws as per the Model Law. Keeping in view the urgent need to bring suitable amendment in the existing laws to facilitate electronic commerce and with a view to facilitates Electronic governance, the information technology bill (IT Bill) passed by Indian Parliament on May 17, 2000. The Information Technology Act (IT Act) came into effect on 17 the October 2000.

The main objective of the Act is to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication and storage of information to facilitate electronic filing of documents with the government agencies. The act has extra – territorial jurisdiction to cover any offence or contravention committed outside the country by any person. It also involves legal provisions relating to piracy, defamation, advertising, taxation, digital signature, copyright and trade secrets in the cyber world. This bill intends to facilitate e-commerce by removing legal uncertainties created by the information technology. Some important provisions of Information Technology Act 2000 are reproduced here.

The IT Act shall extent to the whole of India and applies also to any offense or contravention committed outside India by any person. As regard the applicability of the Act to offences and contraventions, the nationality of the accused in irrelevant if the act or conduct constituting the offence or contravention involve a computer, computer system or computer network located in India. Some of the major provisions contained in the IT Act 2000 are as follows:

1. Electronic contracts will be legally valid.
2. Legal recognition of digital signatures
3. Security procedure for electronic records and digital signature
4. Appointment of certifying authorities and controller of certifying authorities, including recognition of foreign certifying authorities.
5. Various types of computer crimes defined and stringent penalties provided under the Act.
6. Establishment of cyber Appellate Tribunal under the Act.
7. Act to apply for offences or contraventions committed outside India.
8. Power of police offices and other officers to enter into any public place and search and arrest without warrant.
9. Constitution of Cyber Regulations Advisory Committee who will advise the central Government and Controller (Koroth, 2010:161)

Information Technology (Amendment) Act, 2008

Rapid increase in the use of computer and internet has given rise to new forms of crimes like, sending offensive emails and multimedia messages, child pornography, cyber terrorism, publishing sexually explicit materials in electronic form, video voyeurism, breach of confidentiality and leakage of data by intermediary, e-commerce frauds like cheating by personation – commonly known as phishing, identity theft, frauds on online auction sites, etc. So penal provisions were required to be included in the information Technology Act, 2000.

Government had introduced the information technology (Amendment) Bill, 2006 in Lok Sabha on 15th December 2006. Both houses of Parliament passed the Bill on 23rd December 2008. Subsequently the information Technology (Amendment) Act, 2008 received the assent of President on 5th February 2009 and was noticed in the Gazette of India.

Prevention is always better than cure. It is always better to take certain precautions while operating the net. The 5 P mantra for online security are: Precaution, Prevention, Preservation and Perseverance. A netizen should keep in mind certain things to avoid disclosing any information pertaining to oneself. This is as good as disclosing your identity to strangers in public place and always avoids sending any photograph online particularly to strangers and chat friends as there have been incidents of misuse of the photographs. Always use latest and update antivirus software to guard against antivirus attacks. Always keep back up volumes so that one may not suffer data loss in case of virus contamination. And never send your credit card number to any site that is not secured, to guard against frauds. At the same time always keep a watch on the sites that our children are accessing to prevent any kind of harassment or depravation in children. It is better to use a security programme that gives control over the cookies and send information back to the sites as leaving the cookies unguarded might prove fatal, and use of firewalls may be beneficial. It is also suggested that web owners should watch traffic and check any irregularity on the site and web servers running public sites must be physically separate protected from internal corporate networks.

New Threats of IT Industry:

We live in an exciting time in history. The wide spread availability of computers and Internet connections provides unprecedented opportunities to communicate and learn. Unfortunately, although most people use the Internet as a powerful and beneficial tool for communication and education, some individuals exploit the power of the Internet for criminal or terrorist purposes.

The more dramatic abuses of computer technology, such as major Internet hackings of company websites and online theft of credit card numbers, achieve much attention. Most cases are more delicate, frequent and attached to everyday workings of ordinary, law abiding citizens. There are only few clear rules to govern ethical computer behavior, and many new situations arise with great frequency, which can prove dangerous especially when these are related with business and sensitive information.

Issues like collection of private data of the user using Internet by monitoring the traffic is strongly related to one's policy as that information can be further used for illegal purposes. These types of privacy issues are needed to be addressed properly so that they should not exploit one's freedom. One reason that topics such as online gambling and pornography have become such firestorm of controversy in cyberspace is the simple fact that so many people have access to the websites. With this another issue "censorship" comes which should be deal in efficient way as it is not easy to implement.

There are some many technical, social and cultural threats also identified along with IT industry booming in all over the world. While, identify theft – a thief steals your name, address, social security number and bank account and credit card information and runs up debts in your name, online annoyances, spam – unwanted or junk email, cookies, phishing and internet hoaxes, hackers, worms, malware etc. are considered the technical threats of IT industry, threats like information overload, cyber addiction, health issues etc are the examples of social and cultural threats developed along with IT industry in the modern technological world.

Information Overload

Information overload refers to the addiction towards unlimited information available on the internet. The addict in the case finds a craving for searching and reading information of his interest on the internet. It often results in stress and anxiety related disorders. The term information overload was first coined by the greater futurist and writer Alvin Toffler in his book 'Future Shock'. The concept of future shock resolves around the changes that are taking place with regards to individuals and society. In his book, Toffler projects the concept of information overload as a psychological disorder caused due to abundance of information availability. The amount of information on the interest has been growing in leaps and bounds. Such as greate magnitude information development and that too at such a rapid pace has led to an information explosion of sorts. More and more number of internet users are becoming victims of information sourced from a large number of websites, emails, blogs, reviews, messengers, social networking sites etc.. The consumption of such a huge volume of information is increasingly becoming difficult for the users and thus causing anxiety, irritation and stress.

Compulsive web surfing of data base searching lead to lower work productivity and less social interaction with family and friends. This will creates many confusion and doubts for decision making and such a situation makes more problematic life condition and negative influence on one's personality development. In a world full of information we seem to be constantly struggled with managing all the new information we get on a daily basis and feeling totally overwhelmed by information overload. With the arrival of the internet we were told that things would become easier and more time to enjoy life. Information is coming in from all sides in the form of reports, memos, newspapers, journals and letters. Now the advent of email and internet accelerated this issue.

Wilson has provided definitions of information overload as a personal phenomenon and as an organizational phenomenon at the personal level, he defines information overload as " a perception by a person (or observer) that the information associated with work tasks in greater than can be managed effectively, and a perception that such overload creates a degree of stress for which the coping strategies are ineffective, and; at the organizational level as: " a situation in which the extent of perceived individual information overload is sufficient widespread within the organization as to reduce the overall effectiveness of management operations" (Koroth 2010:173).

Some people think that more information is always better than less information. However, it is to be remembered that there is a limit to the amount of information that people can handle. Too much information creates information overload. Information overload is a situation where an individual is given too much information and as a result he is confused and cannot make optimal decisions.

In other words, information overload is a phenomenon of having so much information that the very volume creates the additional work of having to decide what is important, rather than helping executives to solve problems and make decisions. One of the best precautionary measures for protecting oneself from information overload is to consume the information in a systematic and precise manner instead of bulk consumption.

Cyber addictions

Cyber addiction can be described as too much use of the computer and internet, affecting the routine life of an individual such an individual who becomes too much dependent on computer and internet is called cyber addict. Cyber addiction is just like any other form of addiction, like television, alcohol, gambling, drugs etc., where there is a strong craving towards internet surfing.

Cyber addiction is often interchangeably referred with many other terms like computer addiction, online addiction, cyber relational addiction, net gaming etc. Among these internet addictions, the most common are cyber sex, online gambling and cyber relational addictions. Internet addiction is the phenomenon that is widely seen in the technological world. Internet addiction covers a variety of impulse control problems. They include;

Computer addiction: It may or may not include addiction towards the internet. It particularly includes addiction towards playing computer games.

Cyber relational addiction: It refers to the addiction towards socializing through the internet. The addict in the case finds a craving for creating online friends through social networking sites; thus often neglecting the real social life. This denotes addiction to social networking, chat rooms and messaging to the virtual and online friends become more important than real life relationships and family members.

Net gaming: As the name suggest, the addict in this case finds a strong craving towards playing online games. The addict particularly finds great sense of triumph in beating other online gamers.

Cyber sex addiction refers the compulsive use of internet pornography. Adult chat rooms etc. are impacting negatively on real life relationships. The rise in internet usage has also corresponded with the increasing availability of online pornography. While cyber sex addiction is a type of sexual addiction, special challenges on the internet include its relative anonymity and ease of access. People can both spend hours on the net in the privacy of their own home, and engage in fantasies impossible in real life. Because real people cannot complete with fantasy, cyber sex addiction can erode and even replace genuine intimate relationships. Maintaining relationships is also very difficult if you are on the internet compulsively for hours.

Signs and symptoms of compulsive internet use may vary from person to person. But there are some general warning sign that our internet use has become a problem like losing track of time online, having trouble completing tasks at work or home, isolation from family and friends, feeling guilty or defensive about our internet use are considered as the signs and symptoms of cyber addiction.

There are some risk factors for internet addiction such as; anxiety, depression, other addictions, lack social support and for the group of teenagers too. One may use the internet to divert himself from his worries and fears. The internet can be an escape from feelings of depression, but too much time online can make things worse. And many internet addicts suffer from other addictions, mainly to drugs, alcohol, gambling and sex too. Besides this internet addicts often use chat rooms, instant messaging, or online gaming as a safe way of establishing new relationships and more confidently relating to others. Teenagers may feel that internet is a wonder world and it might feel more comfortable than real life friends.

There are so many tools and techniques to get our internet use under control. Firstly, identify any underlying reasons of internet addiction which need treatment. Secondly, try to overcome stress and anxiety by increasing our coping skills and thirdly, strengthen the social relationships around us strongly. If a child or teen is showing signs of internet addiction, we can help them by encouraging their other interests and social activities, by monitoring their computer use and set clear limits and by talking with our child about underlying issues.

The internet has revolutionized how we communicate, learn and work. Internet use has exploded in recent years, providing constant, ever-changing source of information and entertainment. Spending a lot of time online is not necessarily a problem. But if we are neglecting our relationships, our work, or other important things in our life, then we may have a problem with internet addiction. If our online activities are getting in the way our "offline" life, it's time to strike a new balance.

Health Issues

The acceleration of change is accompanied by an increase in the information needed to keep up with the developments. This too lead psychological, physical and social problem. A world- wide survey (Reuters, 1996) found that two third of managers suffers from increased tension and one third from ill- health because of information overload. The psychologist David Lewis, who analyzed the findings of this survey, proposed the term "Information Fatigue Syndrome" to describe the resulting symptoms. Other effects of too much information include anxiety, poor - decision making, difficulties in memorizing and remembering, and reduced attention span. These effects merely add to the stress caused by the need to constantly adapt to a changing situation. (Koroth, 2010; 174)

Health problems which may arise on account of information overload are as follows.

1. Increase cardiovascular stress, due to a rise in blood pressure.

2. Weakened vision, according to a Japanese study which predicts a nearly universal near-sightedness in the close future.

3. Confusion and frustration.

4. Impaired judgment based upon overconfidence.

5. Decreased benevolence to others due to an environmental input glut.

6. Weight gain or weight loss.

7. Sleep disturbance.

8. Severe headaches.

9. Back aches and neck aches.

10. Dry eyes or stained vision.

11. Pain in the hands and wrists.

Work place injuries related to musculoskeletal disorder occur frequently in the United States. Approximately 375500 workers experienced such disorders in 2005 and these disorders required an average of 9 days off from work as reported by the United States Department of Labor Bureau of Labor Statistics (www.bls.gov/newsrelease/osh2.toc.htm) .This resulted in business incurring billions of dollars costs such as sick pay, medical costs and even more indirect costs like lost productivity, overtime, value of employee time involved in the accident, cost of record keeping and investigation etc. Avoiding workplace injuries is not only good for employees, but it is very financially favorable for business too.

We can overcome health issues by avoiding discomfort eyestrain or injuries caused by computers. While we are working at our computer we should care the following things.

- Position the monitor or computer correctly: studies suggest its best to place monitor at least 25 inches from our eyes. We may need to decrease the screen resolution to make text and images more readable at that distance.

- Purchase an adjustable chair. Adjust the height of our chair so that feet touch the floor and back support need to be adjustable so that we can position it to support our lumbar region.

- Assume a proper position while typing a Repetitive Strain Injury (RSI) is a painful condition caused by repetitive or awkward movements of part of the body improperly positioned key boards are one of the leading causes of RSIs in computer users.

- Take break in between computers tasks: Remaining in the same position for long periods of time increases stress on the body.

- Shift your position in your chair and stretch your hands and finger periodically.

- Ensure the lighting in adequate. Assuring properly lighting in our work area is a good way to minimize eyestrain. To do so eliminate any sources of direct glare or reflected glare and ensure there is enough light to read comfortably.

- Effective managing of information overload. Information overload could pose some severe psychological hazards to the users. The user hooks on the computer for a long time trying to satisfy his/ her craving for the topic of interest. The craving could be for social networking, chatting with strangers, watching pornographic content and so on. In case of porn addiction, the addict engages himself in viewing, downloading and buying pornographic material on the internet. Such craving for hooking on to such material increase to the extent that it disrupts the routine life of the individual. The addict in such case feels withdrawn when not using the computers. As a result he/she becomes restless, irritated and depressed.

Apart from psychological affect internet addiction could also lead to the many physical affect on an individual. Constantly glaring at the computer monitor could affect the eyesight. Constantly sitting in front is the computer with little or no body movement at all could lead to body strains. Like that constant exposure to electromagnetic radiation have a direct impact on our main body parts, such as brain and the exact nature of such negative affects is still a matter of biological research.

E Wastes:

Electronic waste, popularly known as 'e-waste' can be defined as electronic equipments or products which have become obsolete due to advancement in technology, changes in fashion, style and status and nearing the end of their useful life. (Koroth 2010:176).

E waste includes almost all types of Electrical and Electronic Equipments (EEE) those having entered the vast stream, although e-waste is a general term which can be considered to cover TVs, Computers, mobile phones, home theatre, home entertainment stereo systems, electronic toys and electronic goods like fridge, washing machine etc. Almost all household or business items with electrical components which are used by power or battery supply are included in this category. These electronic appliances are including DVD players, laptops, and MP3 players also.

Most of the people perceive e waste in terms of only IT products which have completed their life cycle are considered as e-waste. In fact, e-waste covers a lot of electronic equipments including household appliances like, vacuum cleaners, dryers, irons, air conditioners, coffee machines, information technology items like fax machines, printers, telephones etc.

E wastes create lot of health effects. These electronic equipments are manufactured using numerous toxic contents and harmful components. These substances severely affect humans and environment in general. Nowadays e-waste is growing in high volume all over the countries, simply because the markets in which these products are produced and sold are also growing rapidly in all parts of the world. Unfortunately, awareness of these harmful substances including in such electronic equipments is still low among general public. Cathode Ray Tubes (CRTs) which are an essential element of few electronic items, Contain carcinogens such as phosphor, lead, barium and other heavy metals. If not disposed properly, these materials are extremely harmful for humans.

The subject of e-waste has turned out to be a serious environmental issue for many nations. Most of the western countries have started to work in this regard with the help of several rules and regulations. WHO (World Health Organization) has also addressed this issue and has specified guidelines to improve the situation. But most of the third world and developing countries are yet to take concrete steps to address this grave issue which is going to be worst in coming decades.

In view of the ill effects of hazardous wastes to both environment and health, several countries urged the need for global agreement to address the problems and challenges posed by hazardous waste. Searching for cheaper ways to get rid of waste "toxic traders" began shipping hazardous waste to developing countries. International outrage following these irresponsible activities led to the drafting and adoption of strategic plans and regulations at the Basel Convention. The convention secretariat provides assistance and guidelines on legal and technical issues, gather statistical data, and conducts training on the proper management of hazardous wastes.

The fundamental aims of the Basel convention are the control and reduction of Trans – boundary movements of hazardous and other wastes including the prevention and minimization of their generation, the environmentally sound management of such wastes and the active promotion of the transfer and use of technologies.

Management of E wastes

There is an uncertainty always existing regarding to the maintenance of electronic items. These electronic scraps lie unattended in houses, offices, ware houses etc. and normally mixed with household wastes, which are finally disposed off at landfills. This necessitates implementable management measures.

In industries management of e-waste should begin at the point of generation. This can be done by waste minimization techniques and by sustainable product design. Waste minimization in industries involves adopting; inventory management, production process modification, volume reduction and recovery and reuse.

Proper control over the materials used in the manufacturing process is an important way to reduce waste generation. Changes can be made in the production process which will also reduce waste generation. This reduction can be accomplished by changing the materials used to make the product or by the more efficient use of input materials in the production process or both. Volume reduction includes those techniques that remove the hazardous portion of a waste from a non-hazardous portion. These techniques are usually to reduce the volume, and thus the cost of disposing of a waste material. Recovery and reuse technique could eliminate waste disposal costs, reduce raw materials costs and provide income from a saleable waste. Waste can be recovered on site or at an offsite recovery facility, or through inter industry exchange. Besides these things, minimization of hazardous wastes should be at product design stage itself. Efforts should be made to design a product with fewer amounts of hazardous materials.

E-waste in Indian Context

While the world is marching at the technological revolution, countries like India are facing a forth coming danger. E-waste of developed countries such as the US, disposes their wastes to India and other Asian countries. A recent investigation revealed that much of the electronics turned over for recycling in the United States end up in Asia, where they are either disposed of or recycled with little or no regard of environmental or worker health and safety. Major reasons for exports are cheap labour and lack of environmental and occupational standards in Asia and in this way the toxic effluent of the developed nations would flood towards the world's poorest nations. It is necessary that developing countries and India in particular wake up to the monopoly of the developed countries and set up appropriate management measures to prevent the hazards and mishaps due to mismanagement of e-wastes. For this the government, industries and the public also should make a movement together in a country.

Waste prevention is perhaps more preferred to any other waste management option including recycling. Donating electronic for reuse extends the lives of valuable products and keeps them out of the waste management system for a longer time.

Re-use, in addition to being an environmentally preferable alternative, also benefits society. By donating used electronics, schools, non-profit organizations and lower income families can afford to use equipment that they otherwise could not afford. E-waste should never be disposed with garbage and other house hold wastes. This should be segregated at the site and sold or donated to various organizations.

Green computing

The concept green computing is quite similar to green chemistry, which focuses on reducing the use of dangerous chemical substances and efficient utilization of energy resources. Green computing refers to environmentally sustainable computing or IT. This term generally related to the use of computing resources in conjunction with minimizing environmental impact, maximizing economic viability and ensuring social duties. It is " the study and practice of designing, manufacturing, using and disposing computers, servers and associated sub systems- such as monitors, printers, storage devices and networking and communication systems efficiently and effectively with minimal or no impact on the environment. Green IT also strives to achieve economic viability and improved system performance and use, while abiding by our social and ethical responsibilities. Thus, green IT includes the dimensions of environmental sustainability, the economics of energies efficiency, and the total cost of ownership, which includes the cost of disposal and recycling. It is the study and practice of using computing resources efficiently." (koroth: 2010: 182)

With increasing recognition that man-made green house gas emissions are a major contributing factor to global warming, enterprises, governments and society at large now have an important new agenda; that are tackling environmental issues and adopting environmentally sound practices. Greening our It products, applications, services, and practices is an economic and an environmental imperative, as well as our social responsibility. Therefore, a growing number of IT vendors and users are moving toward green IT and there by assisting in building a green society and economy.

To comprehensively and effectively address the environmental impacts of computing / IT, we must adopt a holistic approach and make the entire IT Life cycle greener by addressing environmental sustainability along the following four components.

1. **Green use** –reducing the energy consumption of computers and other information systems as well as using them in an environmentally sound manner.
2. **Green disposal**- renovating and reusing old computers and properly recycling unwanted computers and other electronic equipments.
3. **Green design**- designing energy-efficient and environmentally sound components, computers, servers, cooling equipment and data centers.
4. **Green manufacturing**- manufacturing electronic components, computers and other associated subsystems with minimal impact on the environment.

Some common green computing practices include turning off the monitor when it is not in use or using more energy efficient monitors like LCD instead of the traditional CRT monitors, volunteer computing or file sharing practices, virtualization of servers, using more energy efficient and less noisy cooling systems like using liquid cooling systems instead of the conventional heat sinks and fans, temperature maintenance and regulation to reduce thermal shock wear and tear to computer parts, and increased online security measures through the use of firewalls, anti spyware and antivirus programs to reduce the increasing amount of e-waste on the internet and on other networks.

Some of the key approaches that are followed as part of green computing are;

1. **Efficient algorithm**: A large algorithm would obviously require large memory space and more time for execution; thus in a way leading to energy and resource wastage. Thus it is always to keep the algorithm efficient from the point of view of time and space trade off.
2. **Virtualization of computer system**: It involves creating multiple virtual computer systems serving each of its own individualistic functions, on a single physical hardware system. The entire virtualization concept is based on the approach of "optimum utilization of available resources"
3. **Power management**: it involves managing the power in such a way as to minimize its wastage. This approach makes use of software controlled power management applications to eliminate power wastage. Some of its examples include screen savers automatic stand by, etc.
4. **Recycling e-waste**: This approach focus on recycling of e-Waste like old, broken or useless electrical or electronic devices.

Reference

Evans, Alen….etal, 2010, *Informatics: Technology in Action,* Pearson.

Koroth, Abdul Assis, 2010, *General Informatics*, Calicut university Central Co-Operative store Ltd. No.4347, Calicut University

K. Ravindran Asari, 2010, *Informatics: Introduction*, Ane Books.

Mathew, Armand, *The Information Society*, London sage publications

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