DIPLOMA IN MEDIA AND COMMUNICATION

MCG604

NEW COMMUNICATIONS TECHNOLOGY

WEEK 1

Definition of Communications System:

Communications system is a means by which the information that is in the coded form can be exchanged.

For example, to send an email to a friend we need a computer, a modem, an internet connection and other components. The computer, modem, internet connection, etc. is called the communications system.

Examples of Communications systems: Telephone, computer, satellite, television, etc.

What is Information? How is it Transmitted?

Information can be defined as a collection of symbols that, when combined, communicates a message or intelligence (Mirabito & Morgenstern, 2004)

Firstly, the information is coded into a standard form (electronic or electrical signals).

Next, the coded information is relayed to the receiver. The relay can be done via a telephone line or satellite or any other communications channel.

At the point of receiving, the coded information is decoded or converted to its original form.

That means, the communications system has an information source, a transmitter, a relay, a receiver and a destination.

Consequences of Communication Revolution

New communication technologies have been changing our social structure.

Society is depending a lot on technology and information.

At the same time, the interdependence of technology, information and society is raising many ethical questions as well.

Anticipated problems like plagiarism, loss of jobs, wastage disposal, etc. became the areas of concern.

Class distinction in the society became more prominent between people who are tech savvy and those who are not.

Consequences of Communication Revolution

Literally every field is shifting or has already shifted to computer based applications for their day-to-day operations.

The problem with this sudden development is that though now the information is accessible by everyone and it is becoming a lifeline, not everyone has the skills or knowledge to access this information and they may remain *information poor*.

Positive Aspects of Communication Revolution

Usage of computers in medical procedures have improved the treatment of critical illnesses like cancer.

Similarly, the physically handicapped could communicate better using the computer systems.

It is very obvious that more people now have greater access to information when compared to the people of yesteryears.

Problems Associated with the Interdependence of Technology and Information Society

Our information and communication system could be crippled and silenced forever just by a single high-altitude explosion.

The nuclear explosions can cause powerful electromagnetic pulses (EMPs) which can affect the electronic components, equipment and systems. So, the Emergency Broadcast Systems (EBS) which are meant to be operative during such emergencies are being considered to be set up by the governments.

But the problem here is the receiving point (a radio, since the radios are not damaged by the EMPs) may be using a power source like electricity that comes from power plants and the power plants may not function during such situations. Also, nowadays, the radios are a part of the stereo systems which cannot work after a nuclear explosion.

Problems Associated with the Interdependence of Technology and Information Society

The more sophisticated our communication systems, the more vulnerable they are to attacks (by terrorists).

Though the vacuum tubes would have been a better alternative in resisting EMPs, they are no more in use and have been replaced by solid-state chips which are more vulnerable.

Problems Created by the Emergence of New Technologies

• Intellectual property questions - the same tools that are used to create an authentic work can be used to copy it illegally.

• Though the copyright laws are created to punish such offenders, they may not be effective if not enforced properly.

• Legal issues related to the free flow of information - software applications like desktop publisher can be used to print a newspaper. The question now is should this electronic information service be treated as a publisher or a distributor?

• Invasion of privacy - emails and other documents in the softcopy form are prone to be stolen through hacking or viruses.

• Electronic eavesdropping - Governments can eavesdrop on the information being transmitted through electronic gateways.

Technical Elements in the Modern Communication Systems

Transducer

- This is a device that converts one form of energy into another. For example, when someone talks on the phone, the microphone, which is a transducer converts the voice (sound energy) into electrical energy (an electrical signal). The speaker, which is also a transducer, converts this electrical signal back to the voice.

- A transducer is a link between the communication system and the real world.

Technical Elements in the Modern Communication Systems

Signal

- Signals are series of waves travelling through the connecting line.

- A signal wave has both amplitude and frequency, amplitude being the wave’s height (strength of signal) and frequency is the pitch of the voice.

- Frequency is measured in number of cycles per second (cps). For example, if there are 100 waves that pass a point in one second, then the frequency of the signal is 100 cps or 100 Hz (Hertz).

Technical Elements in the Modern Communication Systems

Bandwidth

- Bandwidth of the particular channel is the capacity to accommodate the volume of information in a given period of time.

- As the frequency increases, its capacity to carry information also increases.

- The signal is then relayed on a channel wide enough to accommodate this information.

- A TV signal has a higher bandwidth requirement compared to a radio or telephone signal.

Technical Elements in the Modern Communication Systems

Modulation

- This is the process by which information is superimposed or impressed on a carrier wave for transmission.

Noise

- Noise can be internal, from the equipment itself (machine generated), or external, caused by outside sources (like lightning).

- For information to be successfully relayed, the noise must not exceed a certain level (signal to noise ratio).

Technical Elements in the Modern Communication Systems

Electromagnetic Spectrum

- This is the entire collection of frequencies of electromagnetic radiation, ranging from radio waves to X rays to cosmic waves.

- Radios use the radio-frequency range for radio transmissions.

- Spectral space has monetary value; the communication systems using the electromagnetic spectrum can generate income (e.g. : TV, radio, X-rays, visible light, etc).

- Spectrum usage requires payment of fee due to the huge demand by private companies.

- Usage of spectrum for commercial purposes like television transmission is opposed by a few. They prefer TV signals to be delivered by a cable, thus freeing the spectrum for wireless communication.

References:

(1) Mirabito M & Morgenstern B, 2004,*The New Communication Technologies Applications, Policy, and Impact, 5th Edition,* Butterworth-Heinemann, USA