SPPM1013: Telecommunication & Networking

Introduction to Telecommunication

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CONTENTS

- Introduction to the course
- Introduction to telecommunications
- Basic elements of computer & communication systems

About this course : Synopsis

This course will expose the students to the technologies and devices for computer networking and internet access and applications. It will cover fundamentals of data communication, telecommunication facilities and network topology.

Students will be introduced to the Internet technology and its applications, and also social and ethical issues related to web resources.

At the end of the course students should be able to demonstrate their understandings by using Internet applications for teaching and learning, able to evaluate web resources, awareness of ethical, social and legal issues related to web resources.

Students also should be able to use various internet applications for teaching and learning

Objectives

At the end of this session you would be able to

Identify the content and requirements of the course

Describe the **definition** of communication and communication process

Detail the **communication technology** development

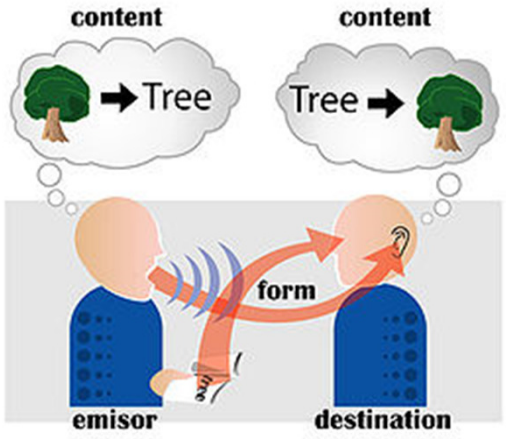
Explain six **elements** in computer and communication systems

Item	Status	Percentage
Assignment 1	Analysis & Critical Report on Networking Setup (Group)	20%
Service Learning Project	Service Learning (Group)	15%
Test	Mid semester test	15%
Online participations	Online forum and E-learning Activities	5%
Presentation	Report Presentation (Assignment 1)	5%
Final Exam	Individual	40%
Total		**100%**

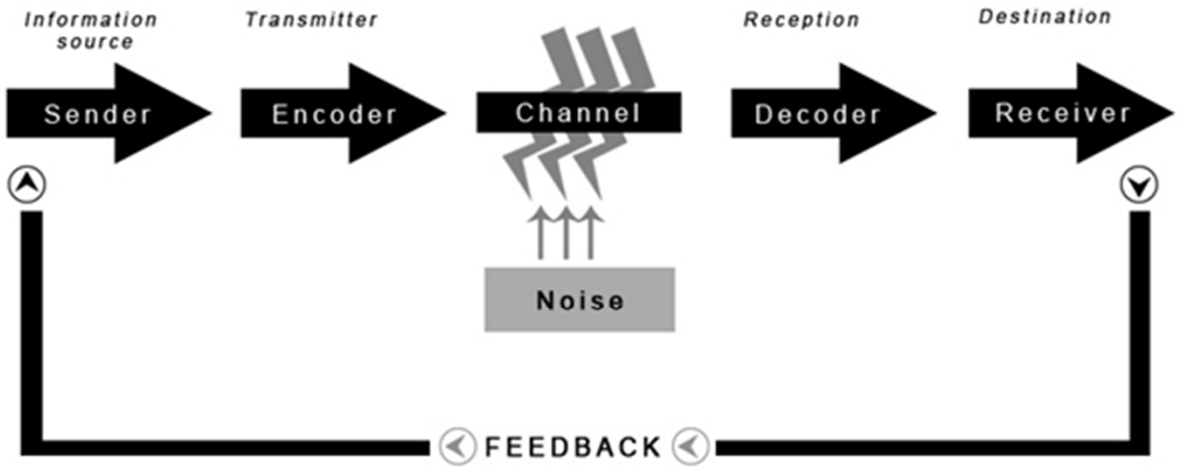
Introduction to Telecommunication

What is communication?

- Communication is the **imparting, conveying or exchange** of **thoughts, messages, ideas, knowledge or information by sign and sounds like speech, signals, writing or behavior**

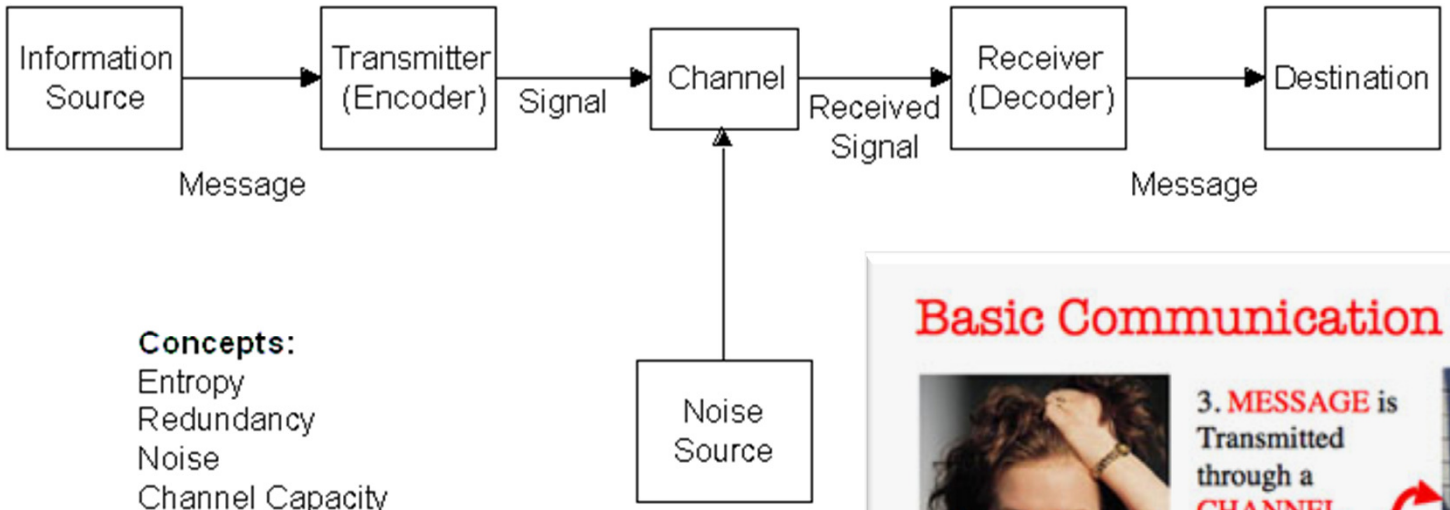


Communication model



SHANNON-WEAVER'S MODEL OF COMMUNICATION

The Shannon-Weaver Mathematical Model, 1949



Concepts:
Entropy
Redundancy
Noise
Channel Capacity

Basic Communication Model

What is telecommunications?

communication over a **long** distance

(tele = far off)

Telecommunications refers to the transfer of **data** (communications) from a **transmitter** to a **receiver** across a **distance**

Data/code represented by some form of electromagnetic energy – electricity, radio waves, lights – transmitted through medium- wire, cable, atmosphere.

Development of Communications Technology & Computer Technology

Computer Technology

1642 AD — First mechanical adding machine (Blaise Pascal)

1832 — Babbage's difference engine (automatic calculator)

1843 — World's first computer programmer, Ada Lovelace, publishes her notes

Communications Technology

1562 — First monthly newspaper (Italy)

1594 — First magazine (Germany)

1639 — First printing press in North America

1827 — Photographs on metal plates

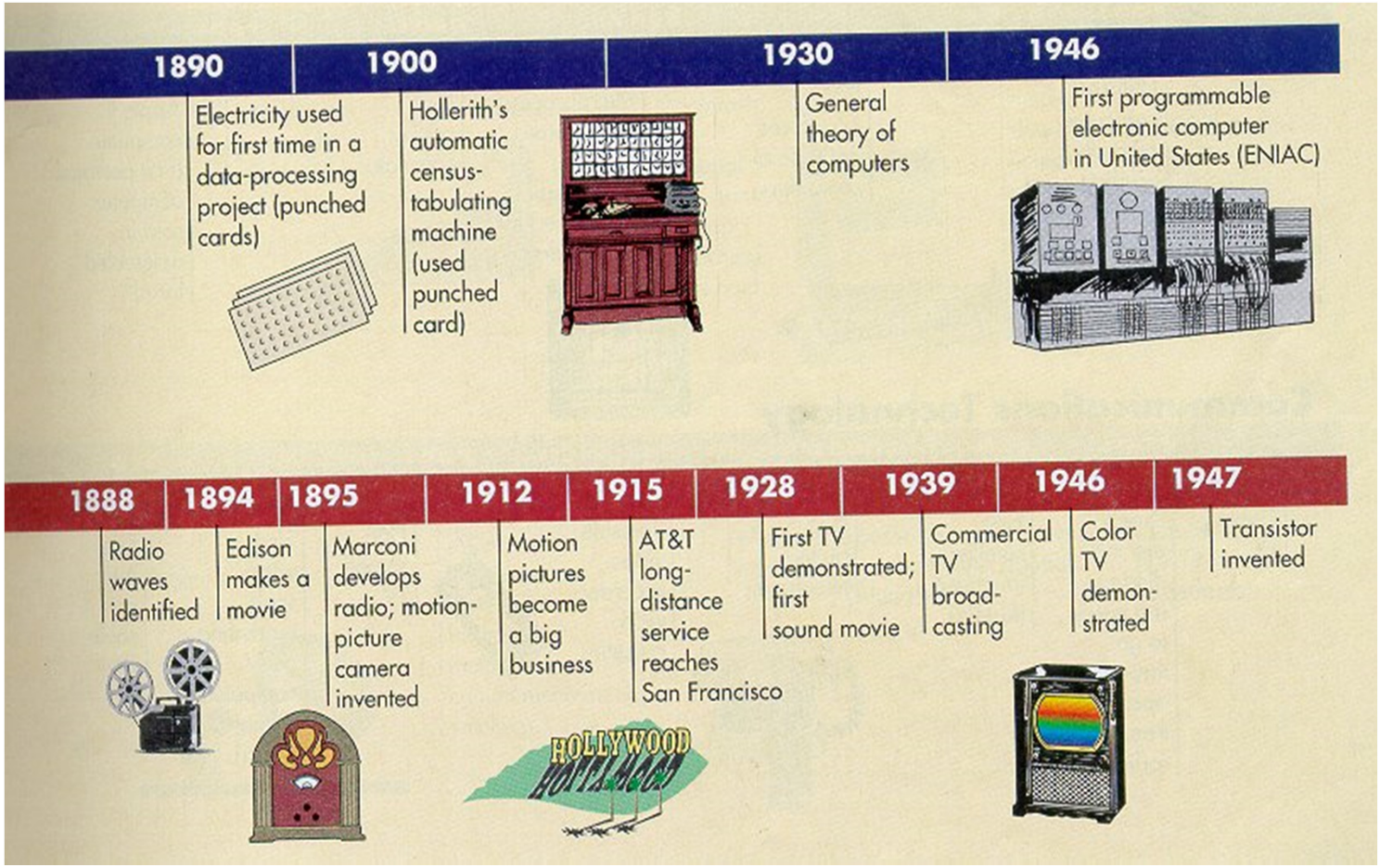
1835 — Morse's telegraph (first long-distance digital communication system)

1846 — High-speed printing

1866 — Trans-atlantic telegraph cable laid

1876 — Telephone invented

Development of Communications Technology & Computer Technology



Development of Communications Technology & Computer Technology

Computer Technology

1952 — UNIVAC computer correctly predicts election of Eisenhower as U.S. President

1964 — IBM introduces 360 line of computers

1970 — Microprocessor chips come into use; floppy disk introduced for storing data

1971 — First pocket calculator

1977 — Apple II computer (first personal computer sold in assembled form)

Communications Technology

1950 — Cable TV

1952 — Direct-distance dialing (no need to go through operator); transistor radio introduced

1957 — First satellite launched (Russia)

1961 — Push-button telephones

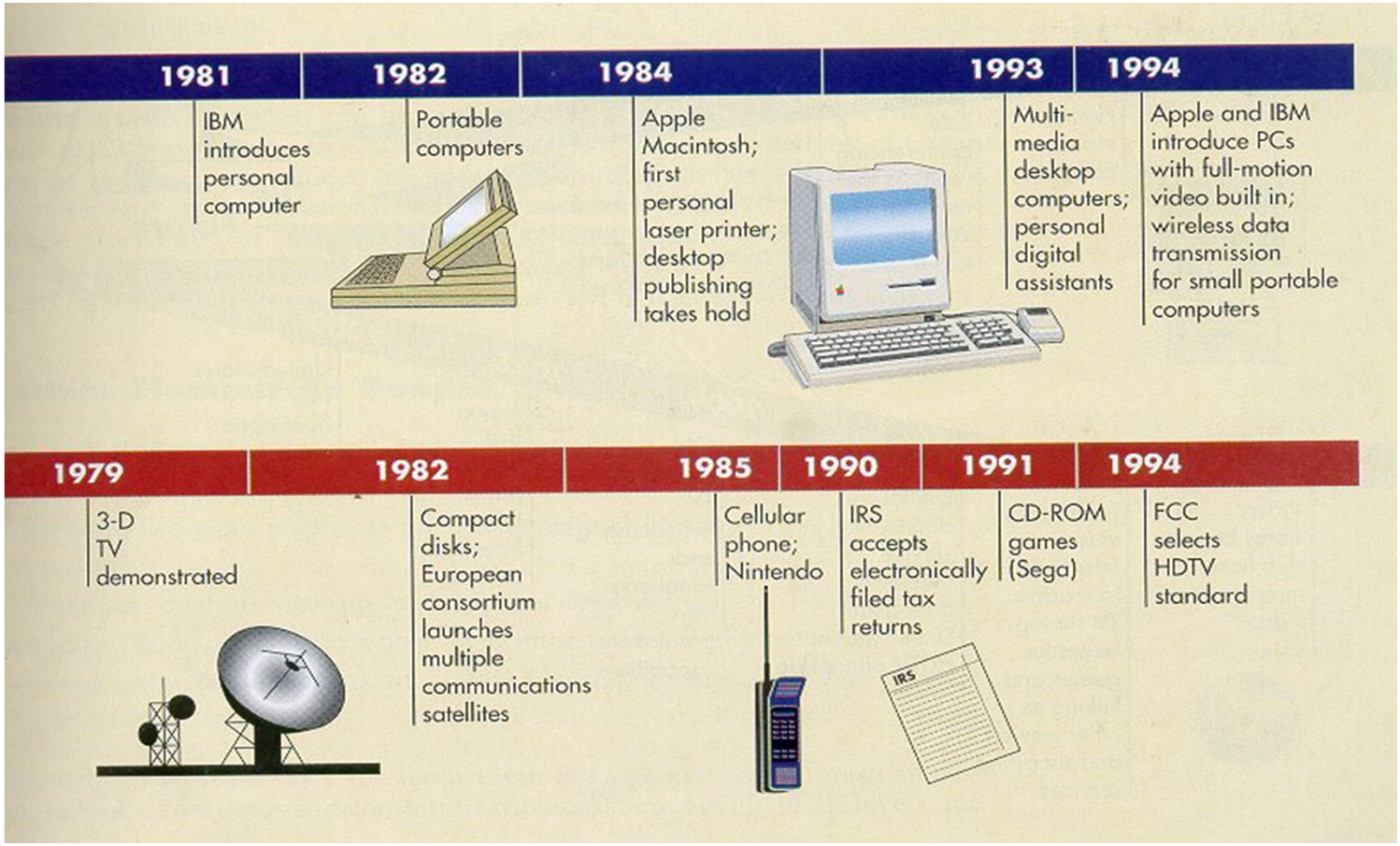
1968 — Portable video recorders; video cassettes

1975 — Flat-screen TV

1976 — First wide-scale marketing of TV computer games (Atari)

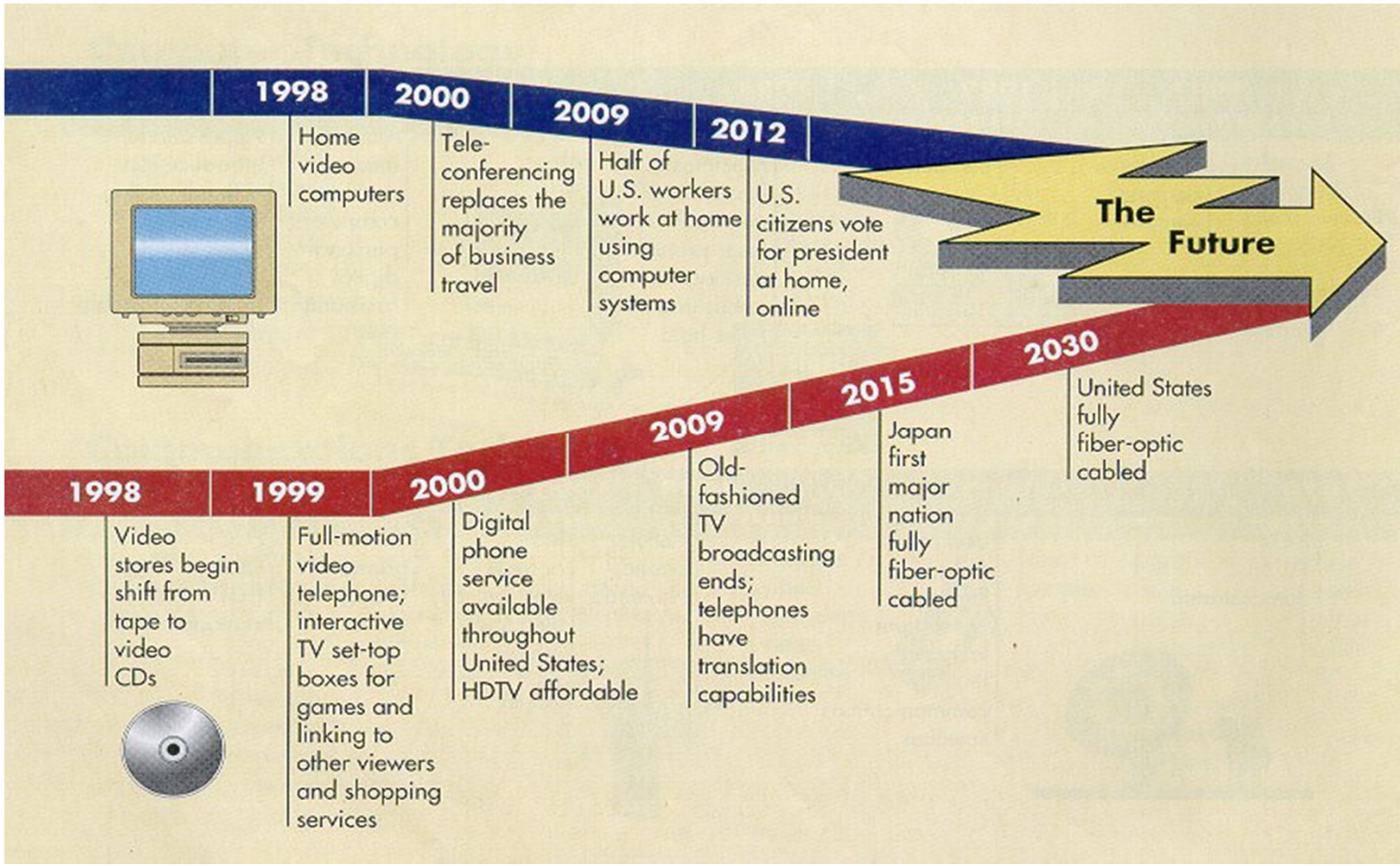
1977 — First inter-active cable TV

Development of Communications Technology & Computer Technology



Development of Communications Technology & Computer Technology

History



The six elements

- The elements of computer and communications technology
  1. People
  2. Procedure
  3. Data/Information
  4. Hardware
  5. Software
  6. Communications/Connectivity

1. People
   - peopleware- user of the computer
   - most important elements in communication
   - built, analyse, and develop the system
   - operate the computer


MY COMPUTER DOESN'T WORK! THE HARD DRIVE CRASHED! WHAT DO I DO?!
DID YOU BACK UP?
WHY? IS IT GONNA BLOW?!
STEINFELD

1. The thin-film facility offers optical and electron scanning microscopy inspection services in addition to a full range of electrical test capabilities.

1. People

- Two categories of people involved in computer and telecommunication
  - Professional
    - Those who have gone true specialized training in theory and technical aspects
    - e.g. : programmer, computer engineer, etc
  - End user
    - Those who only knows how to use without special training in the field.
    - e.g. : clerks, teachers, etc,

2. Procedure

- An ordered set of tasks for performing some action
- A clear specification for the sequence, timing, execution, etc. of a process.
- A **procedure** is a specification of the series of actions, acts or operations which have to be executed in the same manner in order to obtain always the same result in the same circumstances (for example, emergency procedures).

2. Procedure

- How do you gossips over Whatsapp?

3. Data

- Information stored on the computer system, used by applications to accomplish tasks

- A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automated means.

3. Data

- Data is fundamentally any information of interest, but these days, the word data implies a binary, machine-readable representation of information.

- A representation of facts or concepts in an organized manner in order that it may be stored, communicated, interpreted, or processed by automated means

3. Data

Unit for data

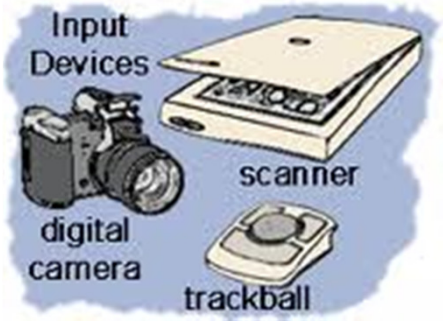
- Bit (binary digits)
- Byte (8 bits)
- Kilobyte (KB) – 2^10 bytes/1000 bytes
- Megabyte (MB) – 1 milion bytes
- Gigabyte (GB) – 1 bilion bytes
- Terabyte (TB) – 1 trillion bytes

Quantities of **bytes**		
Name (Symbol)	**Popular Usage**	**Standard SI**
kilobyte (kB)	$\mathbf{2^{10}}$	10^3
megabyte (MB)	2^{20}	10^6
gigabyte	2^{30}	10^9
terabyte	2^{40}	10^{12}
petabyte	2^{50}	10^{26}

4. Hardware (equipments/devices)

- Hardware-refers to any physical objects that are part of the computer system
- The basic operations of a computer systems are : IPOS
- Computers needs hardware to operates
- 5 categories of ICT equipments/devices:

What are they??



- 5 Categories of hardware devices:
  - Input devices
  - Process devices
  - Output devices
  - Storage devices
  - Communication devices

5. **Software/Program**

- software-refers to instructions that controls the functioning of the computer
- The instructions executed by a computer, as opposed to the physical device on which they run
- **Software** refers to parts of the computer that have no material form; programs, data, protocols, etc are all software. When software is stored in hardware that cannot easily be modified (such as BIOS ROM in an IBM PC compatible), it is sometimes termed firmware to indicate that it falls into an area of uncertainty between hardware and software
- A **computer program** is a collection of instructions that describe a task, or set of tasks, to be carried out by a computer.

5. Software/Program

Two types of software:

1. system software
2. application software

Explain

6. Communication

- Communication
- transmission of data (electronic data)
- Conversion of data analog–to-digital digital-to-analog

Discuss this in e-learning

1. It has been rumours lately that the government wants to ‘shut down’ our new version of what so called ‘newspaper’ – which is *Facebook*.
2. Someone even added that *Facebook* could harm their user’s attitude/behaviour.
3. In a group of 4/5, discuss this issue concerning the pros and cons of *Facebook* to our society especially to younger generations. Do we need to restrict the information shared through *Facebook*? Discuss the advantage/disadvantages.
4. In your group, assign members to be one of this:
    1. Initiator (initiates the topic)
    2. Moderators (moderate the discussion)
    3. Summarizer (summarized the discussion)