SPM1012: Telecommunication and Networking

**Topic 1:**
Introduction to Telecommunication

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Introduction to Telecommunication

At the end of this session you would be able to:

Describe the definition of communication and communication process

Detail the communication technology development

Discuss six elements of computer and communication systems
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 **behaviour**
Communication Models
Communication Models

The Shannon-Weaver Mathematical Model, 1949

- Information Source
  - Message
- Transmitter (Encoder)
  - Signal
- Channel
  - Received Signal
- Receiver (Decoder)
  - Message
- Noise Source
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

Visual History of Telecommunication
http://www.youtube.com/watch?v=aBuAujwygLw
Development of Communications Technology & Computer Technology

The Future of Mobile Media and Communication

http://www.youtube.com/watch?v=FScddkTmITc&feature=related

THE FUTURE OF MOBILE MEDIA AND COMMUNICATION : TEASER
HTTP://WWW.YOUTUBE.COM/WATCH?V=GDIUSOCDCXO&FEATURE=CHANNEL
The Six Elements

- The elements of computer and communications technology
  - People
  - Procedure
  - Data/Information
  - Hardware
  - Software
  - Communications/Connectivity
The Six Elements

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

1. People
   – Two categories of people involved in computer and telecommunications
     • Professional
       – Those who have gone true specialised 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,
The Six Elements

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).
The Six Elements

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.
The Six Elements

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.
The Six Elements

3. Data

Unit for data

- Bit
- 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
- ....
- ......
# The Six Elements

<table>
<thead>
<tr>
<th>Name (Symbol)</th>
<th>Popular Usage</th>
<th>Standard SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>kilobyte (kB)</td>
<td>$2^{10}$</td>
<td>$10^3$</td>
</tr>
<tr>
<td>megabyte (MB)</td>
<td>$2^{20}$</td>
<td>$10^6$</td>
</tr>
<tr>
<td>Gigabyte (GB)</td>
<td>$2^{30}$</td>
<td>$10^9$</td>
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<tr>
<td>Terabyte (TB)</td>
<td>$2^{40}$</td>
<td>$10^{12}$</td>
</tr>
<tr>
<td>petabyte</td>
<td>$2^{50}$</td>
<td>$10^{26}$</td>
</tr>
</tbody>
</table>
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:
     • Input
     • Process
     • Output
     • Storage
     • Communication
   - They are..........
The Six Elements

5. Software/Program

- Instructions that controls the functioning of the computer
- The instructions executed by a computer, as opposed to the physical device on which they run
- 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), it is sometimes termed firmware to indicate that it falls into an area of uncertainty between hardware and software
- a collection of instructions that describe a task, or set of tasks, to be carried out by a computer.
The Six Elements

5. **Software/Program**
   - software-refers to *instructions* that controls the functioning of the computer
   - 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
   - *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 program/software
  - system software – programmes that controls the computer
  - application software- programmes that enable users to perform specific tasks

Examples :

a. system software ............

b. application software ........
The Six Elements

6. Communication
   – communication
   – transmission of data (electronic data)
   – conversion of data analog–to-digital
digital-to-analog
Thank You