

INTRODUCTION TO ICT

Lesson 1 – Introduction and Overview

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- I. Information and Information Processing
- II. Basic concepts of ICT
- III. Hardware, Software, Network

Information and Information Processing

- Information
- Data
- Knowledge
- Information System
- Information Processing

Information

- **What is information?**

- Is an abstract concept describing anything that gives human a better understanding, greater awareness about any subject in social or nature
- Information is something that people can learn, know about, or understand (Wiki)
- E.g.:
 - It is hot today
 - Champions League: Barcelona are "95% through" to the Champions League quarter-finals

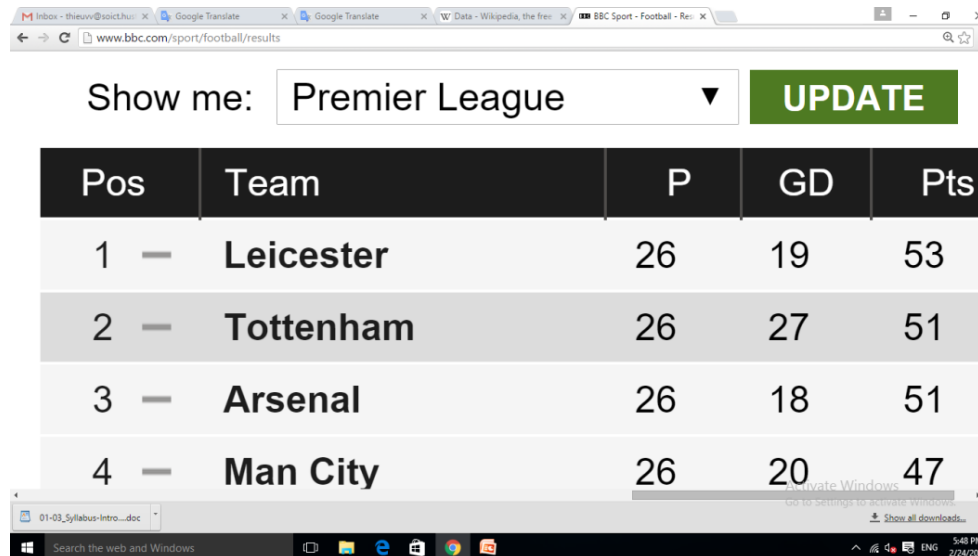
Data

- What is data?
 - is a representation of information using physical signal
 - Data concept refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing (Wiki)
- Information has meaning, but data may not?

Data

- Data can be:
 - Symbols
 - Numbers
 - Characters
 - Physical signal: voice, light, temperature, pressure, humidity, wind, ...

- E.g:



www.bbc.com/sport/football/results

Show me: Premier League

Pos	Team	P	GD	Pts
1	Leicester	26	19	53
2	Tottenham	26	27	51
3	Arsenal	26	18	51
4	Man City	26	20	47

- Information is obtained from data or data is obtained from information?

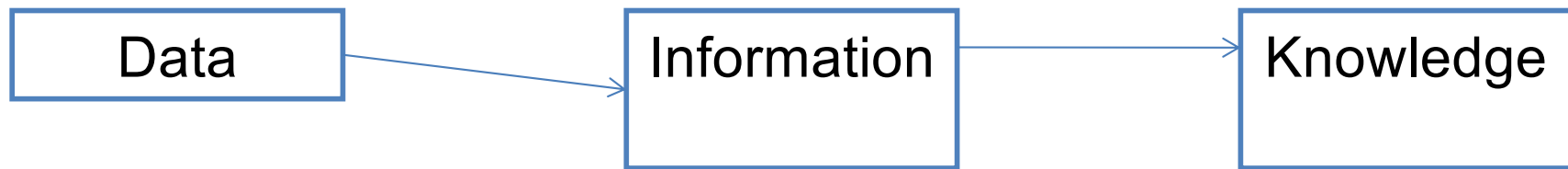
Knowledge

- What is knowledge?
 - Is abstract level of information
 - Knowledge is a familiarity, awareness or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning (Wiki)
- Knowledge may be an event or information, or an understanding about things or phenomena in a specific field
- Knowledge is obtained from studying or doing experiments

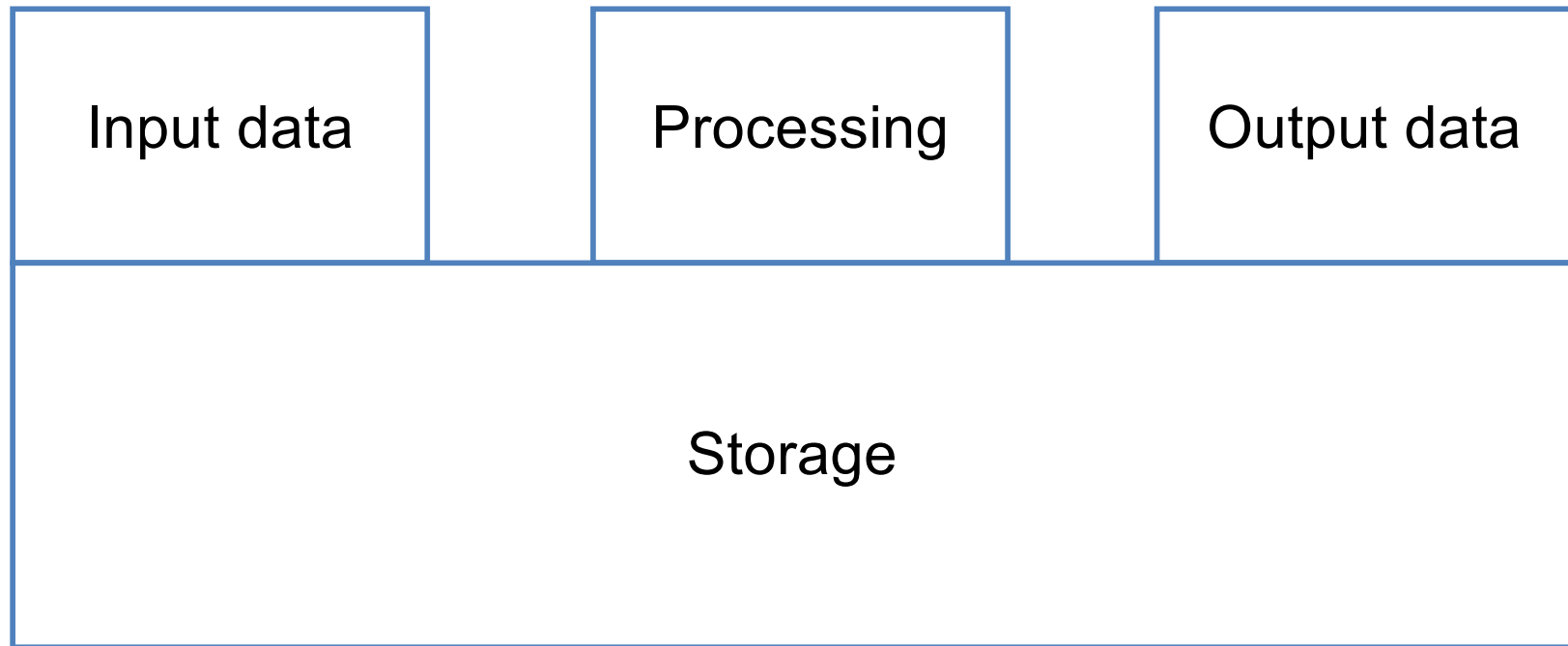
- Information and knowledge: Which one is obtained from the other?

Information System

- *Information system* is a system that stores data, processes data to create valuable information or new data



Information Processing



Information Processing

- Advantages of Processing Information using computer
 - Save time, people
 - Increase correctness
 - Automation
- What are the disadvantages?

II. Basic concepts of ICT

- Informatic
- Information Technology
- Information and Communication Technology

Informatic

- “Informatic” concept is first used in 1957 by Karl Steinbuch in the paper ‘*Informatik: Automatische Informationsverarbeitung*’ (i.e. "Informatics: automatic information processing").
- In England: ‘Computer science’ or ‘Computing science’ is more popular.

Infomatic?

- What does informatic means:
 - is a science that study methods, technologies and techniques to process information automatically.
- The main equipments used in informatic are computers and other communication devices.
- Informatic consists of 2 parts:
 - Hardware engineering
 - Software engineering

Information Technology - IT

- Information technology (IT) is the use of any computers, storages, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data
- Information technology (IT) is the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise

Information and Communication Technology - ICT

- **Information and communications technology (ICT)** is often used as an extended concept of information technology (IT).
- ICT is a more extensive term (i.e. more broad in scope) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information

Information and Communication Technology

- Applications of ICT:
 - In business
 - Science
 - Technology
 - Education
 - Medical
 - Many other

III. Hardware, Software, Network

- Hardware
- Software
- Network

Hardware

- **Computer hardware** is the collection of physical parts of a **computer** system. This includes the **computer** case, monitor, keyboard, and mouse.
- Hardware includes all the parts inside the **computer** case, such as the hard disk drive, motherboard, video card, and many others.
- **Computer hardware** is what you can physically touch
- E.g.?

Software

- **Computer software** (also called a **program** or simply **software**) is any set of instructions that directs a **computer** to perform specific tasks or operations.
- **Computer software** consists of **computer programs**, libraries and related non-executable data (such as online documentation or digital media).
- E.g.?

Network

- Developing history
- Classification
- Basic components
- Internet

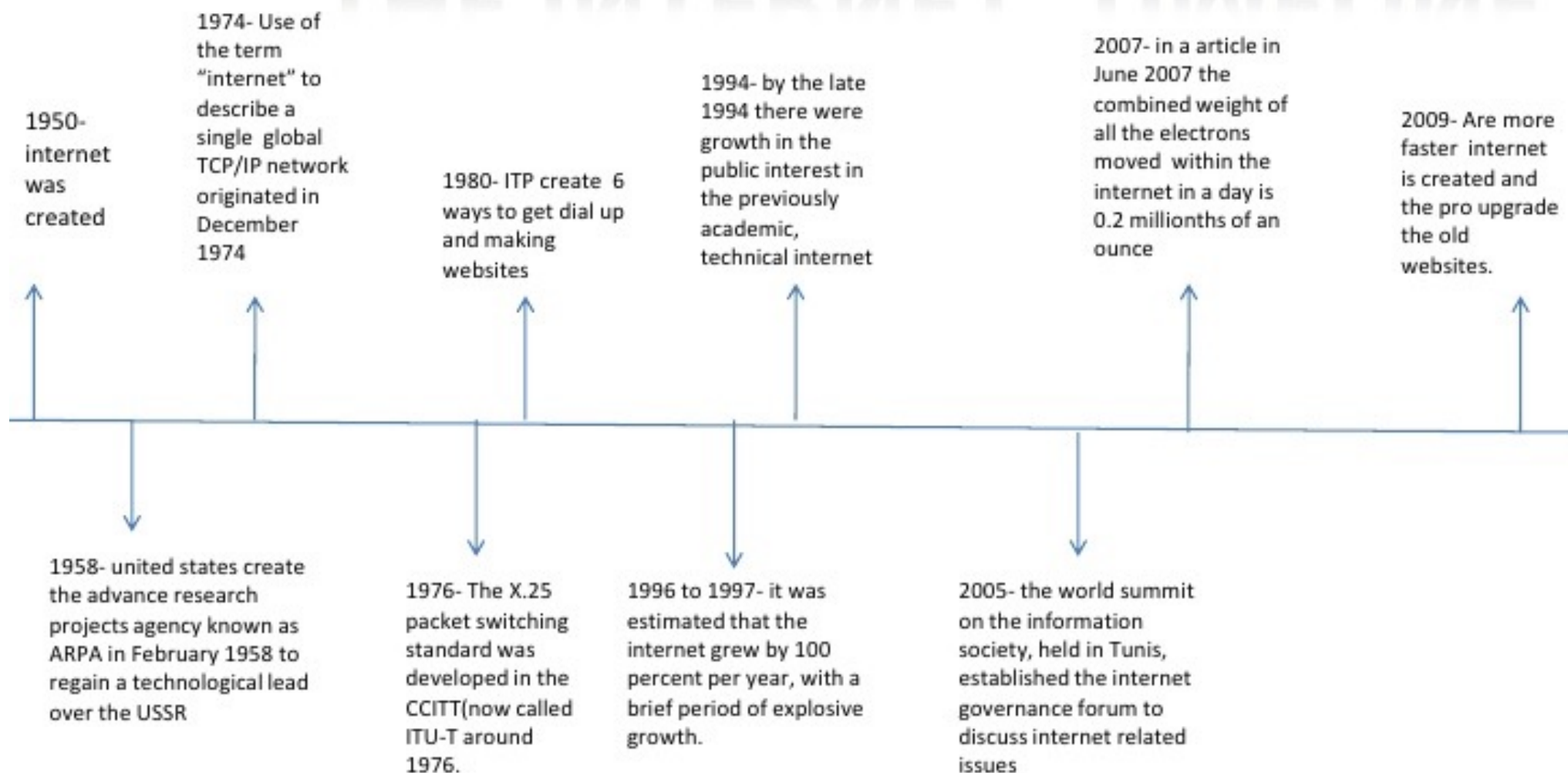
Network

- A **computer network** (or network) is a group of **computer** systems and other computing hardware devices that are linked together through communication channels to facilitate communication and resource-sharing among a wide range of users

Network

- *E.g:*
 - Computer network of HUST
 - Computer network in Ta Quang Buu Library
 - Computer network in a game room
 - Internet

THE INTERNET TIMELINE



Internet: Classification

- By functional relationship
 - client-server
 - Peer-to-peer
 - multitier architecture

Internet: Classification

- **By range**
 - Personal area network (PAN)
 - Wireless PAN
 - Local area network (LAN)
 - Wireless LAN
 - Metropolitan area network (MAN)
 - Wide area network (WAN)
 - Global area network (GAN)

Internet: Classification

- By network topology
 - bus network
 - star network
 - ring network
 - grid network
 - tree network

Components of Network

- Computers, Network cards
- Communication channel
- Network equipment:
 - Modem
 - Hub
 - Switch
 - Gateway
 - Router
 - Bridge
 - Repeater
- Network software:
 - Proxy server, Firewall, Network Address Translator,...

Internet

- **Internet** *is the* global communication network that allows almost all computers worldwide to connect and exchange information
- *Internet* is a GAN, consists of all computer networks in the world that are connected by any communication channel

Requirements to connect to Internet

- A computer
- A modem and a telephone line (if you are using dial up access), or a data line of some sort (if you are not using dial up access)
- An Internet browser (software) and software to connect you to the Internet Service Provider (ISP)
- An account with an ISP
 - The **ISP** is your gateway to the Internet. You access the ISP over the phone line, and the ISP will connect you to the Internet

Basic services of Internet

- Remote login
- Data transfer
- Email, chat
- Network news