

Unit 1

Introduction to Computer Technologies

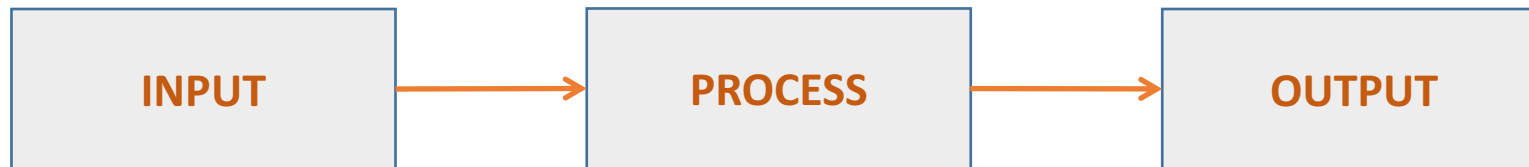
Assoc. Prof. Dr. Tan Chong Eng

Unit Outline

- What is a computer?
- What is a computer system?
- Computer Architecture
- Computer Software
- Basic Computer Hardware
- Computer Networks

What is a Computer?

- An electronic device capable of receiving instructions (**inputs**), understand and carry out what is instructed (**processing the instructions**) and producing results (**outputs**)
- It is like a Digital Assistant



Various Physical forms of Computer



Desktop Computer



Laptop Computer



Tablet Computer



Smartwatch



Smartphone

*Images are from Google Search
and for illustration purpose only.
Copyrights are with each
respective registered parties.*

What is a Computer Systems?

- A complete working system that consists of both computer hardware and software programs
- The computer hardware has the ability to do all the jobs, the software programs tell how should the jobs be carried out by the computer hardware
- Different software programs means different sets of instruction for different tasks or jobs
 - Examples: word processing, excel calculations, graphic editing
- Computer hardware doesn't know what to do without the software

Computer Systems



*Images are from Google Search
and for illustration purpose only.
Copyrights are with each
respective registered parties.*



Trends from 1990 to today...

- Microsoft continues to update Windows. From Windows 95, 98, Me, 2000, XP, Vista, 7, 8 and now Windows 10.
- LINUX operating system, an open source version of UNIX, is taking on MS Windows and gaining in popularity as a free-to-use operating system
- Apple continues to be a major player in personal computing, especially for the “creative market”, iPods, Mac, MacBooks, iPads, iPhones etc.
- HP, Dell, Lenovo, Asus, Acer, are the main PC manufacturers for Windows operating systems
- Internet and WiFi have been a must in today computing

Trends of today... mobile computing

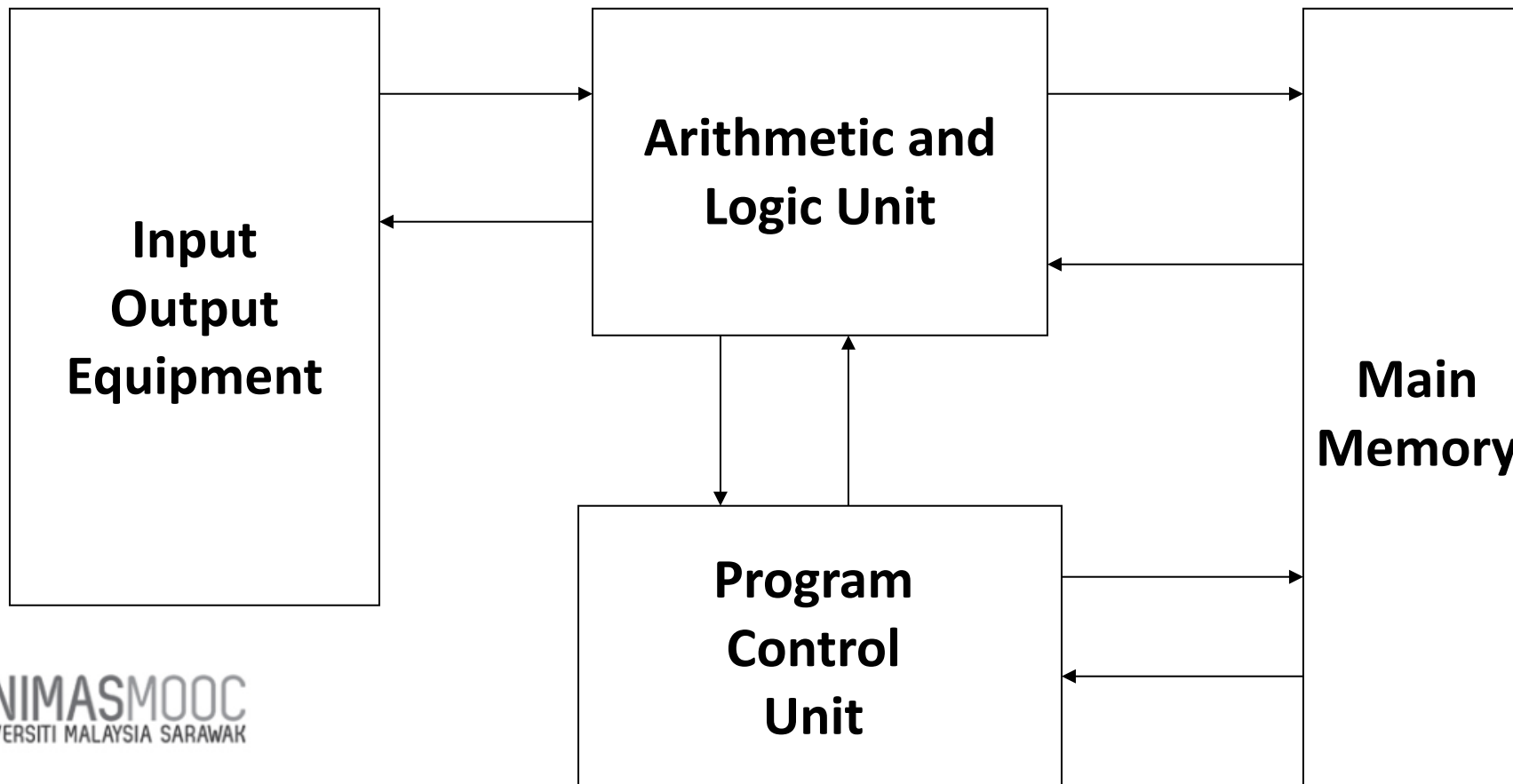
- Smaller in size and battery powered
- Fully embedded with wireless technology (WiFi, 3G and 4G LTE)
- More powerful with Multi-core processors
- More reliable with integrated components
- Easier to use with simpler UI design
- Slowly taking over the roles of conventional computers

Computer Architecture

- What is Computer Architecture?
 - It is a **conceptual design** and **fundamental operational** structure of a computer system.
 - It describes how all internal components of a computer system work together.
 - Main internal components (hardware) are
 - Microprocessor
 - Memory
 - Storage
 - Display
 - Input and Output such as Keyboard / Mouse and Communications

Computer Architecture

- Structure of a Basic Computer (the von Neumann Machine)



Computer Architecture

- For a computer to work, apart from the hardware, there is also software
- What is a software / program?
 - A set of instructions to tell the hardware what to do, especially the microprocessor
- There are 4 types of software program
 - Applications (Word, Excel, etc)
 - Utilities (Antivirus, system recovery, etc)
 - Operating systems (Windows, Linux, MacOS, etc)
 - Device Drivers (display card driver, webcam driver, printer driver, etc)

Computer Architecture

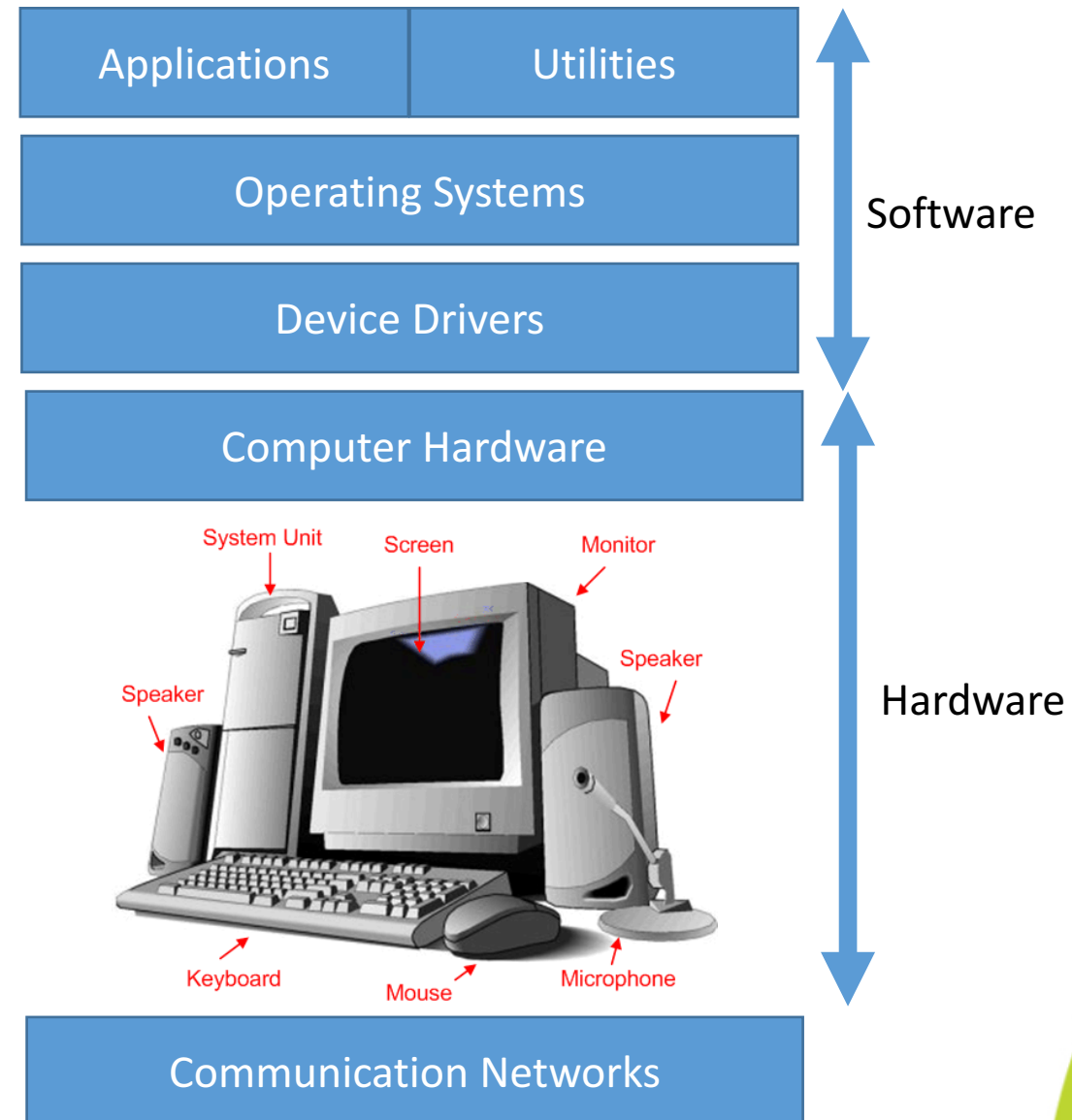


Image source:
http://www.assignmenthelp.net/assignment_help/what-is-computer-hardware

Computer Software: User Applications

- These are the tools or applications that users interact with directly.



Computer Software: Operating Systems

- These are the different computing platforms to support high level user applications



Computer Software: Device Drivers

- All hardware integration in a computer system would require individual device driver in order to work with the main computer system



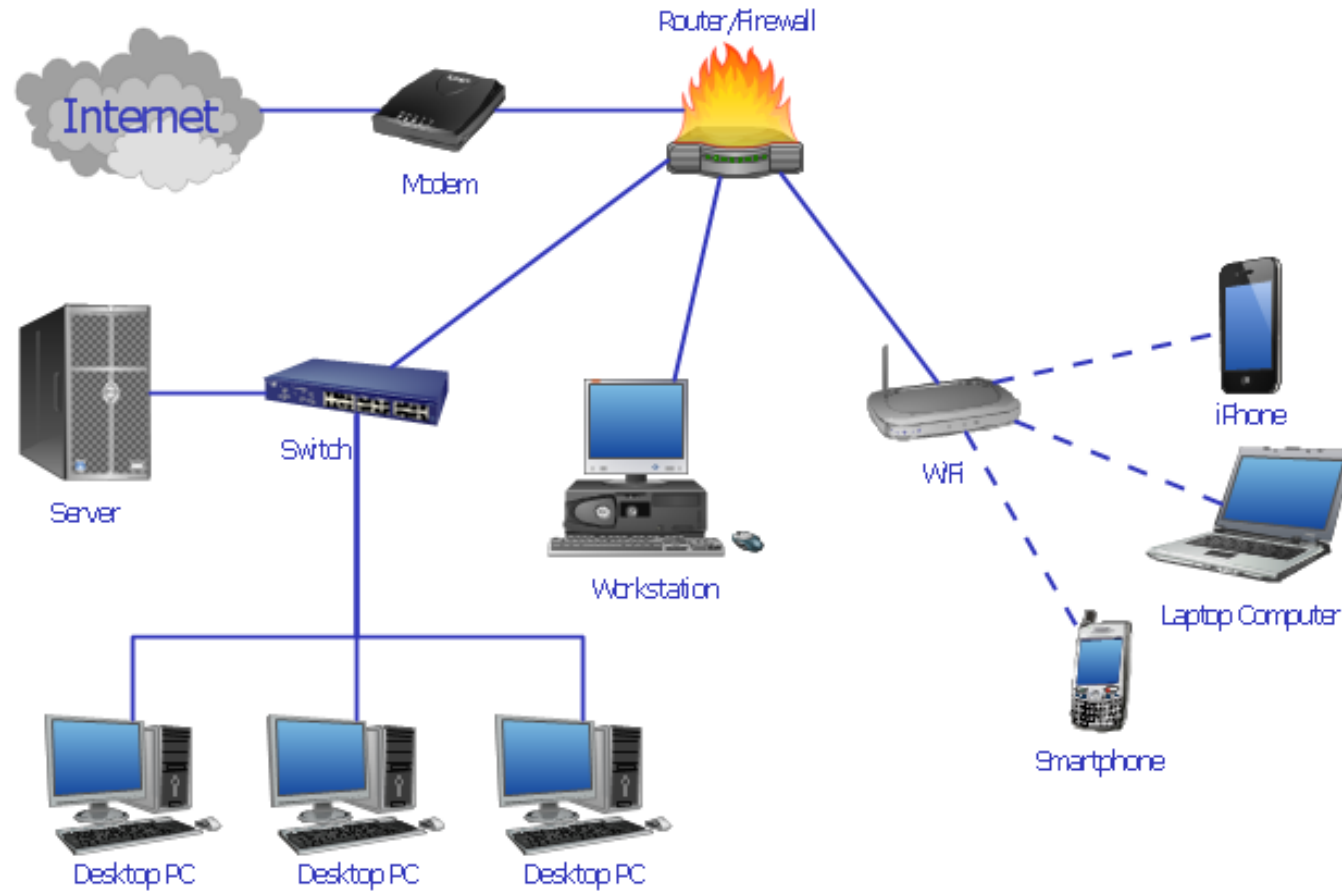
Device Drivers Support



Basic Computer Hardware



Computer Network



Summary

- **Computer** – a computing device that can take many forms
- **Computer system** – a complete computing system that users can interact through its software applications
- **Computer Architecture** – the basic building concept of a computer consists of main computer hardware
- **Computer Software** – sets of instructions to instruct the microprocessor how to carry out tasks
- **Basic Computer Hardware** – the hardware components that build a working computer
- **Computer Networks** – a communication network to allow interaction among computer systems