INFS 214:
Introduction to Computing

Session 9 – The System Unit

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Session Overview

- System Unit or System Cabinet typically consists of a metal or plastic enclosure containing components that are fragile or not meant to be handled very often.

- The system unit consists of the outer case and a number of components held inside it, including the power supply, motherboard, processor, hard drives, and DVD drives. System unit is a case that has electronic components of the computer used to process data.

- This session seeks to explain the components that are housed in the system unit and the functions they perform. It also explains the term buses, ports and eternal cards.

Session Overview

- At the end of the session, the student will
  - Be able to identify all the components housed in the system unit
  - Understand the functions of the components in the system unit
  - Understand the types of ports that are available in the system unit
  - Understand the differences and interrelationships between Buses lines
  - Be able to identify the various external cards and their usage

Session Outline

The key topics to be covered in the session are as follows:

- Introduction to System Unit
- Slots and Cards
- Ports
- Bus Lines

Reading List

- Hutchinson, S. E., & Sawyer, S. C. (2013). *Computers: The user perspective.* Boston: Irwin McGraw-Hill. (Chapter 1)

- O'Leary, T. J., & O'Leary, L. I. (2014). *Computer Today*. Boston: McGraw Hill. (Chapter 6)

Topic One

INTRODUCTION TO SYSTEM UNIT

Introduction to System Unit

- System Unit or System Cabinet typically consists of a metal or plastic enclosure containing components that are fragile or not meant to be handled very often. System unit is case that has electronic components of the computer used to process data.

- Those components that are placed in the system unit include: the motherboard, power supply, cooling fans, internal disk drives, memory modules, expansion cards that are plugged into the motherboard, such as video network cards etc.

Introduction to System Unit

- The system board connects all system components and allows input and output devices to communicate with the system unit. It is the main Switchboard of the system. They are also called main board or motherboards. The system board is the communications medium for the entire computer system.

Introduction to System Unit

- Every component of the system unit connects to the system board. It acts as a data path allowing the various components to communicate with one another.

- External devices such as keyboard, mouse, and monitor could not communicate with the system unit without the system board. Notebook and handheld system boards are smaller than desktop system boards. However, they perform the same functions as desktop system boards.

Introduction to System Unit

- On a desktop computer, the system board is located at the bottom of the systems unit or along one side. It is a large flat circuit board covered with a variety of different electronic components including: Sockets, Slots and Bus Lines.

Questions

- **Individual Assignment:**
  - Give examples of expansion cards

- **Forum Question:**
  - Discuss the various types of ports that are used to connect external devices to the system unit

Topic Two

SLOTS AND CARDS

Slots and Cards

- The expansion card (also expansion board, adapter card or accessory card) in computing is a printed circuit board that can be inserted into an electrical connector, or expansion slot on a computer motherboard, backplane or riser card to add functionality to a computer system via the expansion bus.

- Expansion slots provide an open architecture. There are other computers with close architecture . Expansion cards provide connections for video, computers, TV tuner cards, and others.

Slots and Cards

- Expansion cards are also called plug-in boards, controller cards, adapter cards, and interface cards. They are plugged into slots located on the system board.

- Ports on the cards allow cables to be connected from the expansion cards to devices outside the system unit.

- There are a wide range of different types of expansion cards. Some of the most commonly used expansion cards are:

Slots and Cards

- **Video cards**
- Also known as graphics cards, these cards connect the system board to the computer\ monitor. The cards convert the internal electronic signals so video signals so they can he displayed on the monitor

- **Modem cards**
- Also known as internal modems, these cards allow distant computers to communicate with one another by converting electronic signals from within the system unit into electronic signals that can travel over telephone lines and other types of connections.

Slots and Cards

- **Network interface cards (NIC)**
- These cards also known as network adapter cards, used to connect a computer to one or more other computers. This forms a communication network whereby Users can share data, programs, and hardware.

- **TV tuner cards**
- Now you can watch television, capture video, and surf the Internet at the same time. TV tuner cards also known as television boards, video recorder cards, and video capture cards, contain a TV tuner and a video converter that changes the TV signal into one that can be displayed on your monitor.

Slots and Cards

- **PC cards**
- To meet the size constraints of notebook and handheld computers, credit card-sized expansion cards have been developed. These cards can be easily inserted and removed. They are called PC cards or Personal Computer Memory Card International Association (PCMCIA) cards.

Slots and Cards

- **Plug and Play**
- Plug and Play is a set of hardware and software standards developed by Intel, Microsoft, and others. It is an effort by hardware and software vendors to create operating systems, processing units, and expansion boards, as well as other devices that are able to configure themselves. Ideally, to install a new expansion board all you have to do is insert the board and turn on the computer.

- As the computer starts up, it will search for these Plug and Play devices and automatically configure the devices.

Topic Three

PORTS

Ports

- A computer port is a connection point or interface between a computer and an external or internal device.

- Internal ports may connect such devices as hard drives and CD ROM or DVD drives; external ports may connect modems, printers, mice and other devices.

Ports

- A port is a socket for external devices to connect to the system unit. Some ports connect directly to the systems board. Others connect to cards that are inserted into slots on the systems board.

- Some ports are standard features of most computer systems and others are more specialised. Ports are connecting sockets on the systems unit. Serial, parallel, USB, and FireWire are standard ports. Cables connect external devices to ports.

Ports

- **Serial ports**
- Serial ports are used for a wide variety of purposes. They are often used to connect a mouse, keyboard, modem, and many other devices to the system unit. Serial ports send data one bit at a time and are very good for sending information over a long distance.

- **Parallel ports**
- Parallel ports are used to connect external devices that need to send or receive a lot of data at a short distance. These ports typically send eight bits of data simultaneously across eight parallel wires. Parallel ports are mostly used to connect printers to the system unit.

Ports

- **Universal serial bus** (USB)
- Universal serial bus (USB) ports are gradually replacing serial and parallel ports. They are faster, and one USB port can be used to connect several devices to the system unit.

- **FireWire ports**
- FireWire ports, also known as high performance serial bus (HPSB) ports, are as fast as USB ports and provide connections to specialized FireWire devices such as camcorders.

Topic Four

BUS LINES

Bus lines

- Computers comprise of many internal components and in order for these components to communicate with each other, a bus is used for that purpose.

- A bus is a common pathway through which information flows from one component to another. This pathway is used for communication purpose and can be established between two or more computer components

Bus lines

- Bus lines provide data pathways that connect various system components. A bus line, also known simply as a bus, connects the parts of the CPU to each other. Buses also link the CPU to various other components on the system board.

- A bus is a pathway for bits representing data and instructions. The number of bits that can travel simultaneously down a bus is known as the bus width.

Bus lines

- A bus is similar to a multilane highway that moves bits from one location to another. The number of traffic lanes determines the bus width.

- A highway (bus line) with more traffic lanes (bus width) can move traffic (data and instructions) faster. For example, a 64-bit bus is twice as fast as a 32-bit bus. Bus design or bus architecture is an important factor relating to the speed and power for a particular computer.

Bus lines

- **Types of Buses**
- Every computer system has two basic types of buses. One type, called **System Buses**, connects the CPU to memory on the system board.

- The other type, called **Expansion Buses**, connects the CPU to slots on the system board.

Bus lines

- Computer systems typically have a combination of different types of expansion buses. The principal types are; Industry standard architecture (ISA), Peripheral component interconnect (PCI), Accelerated graphics port (AGP), Universal Serial Bus (USB) and FireWire buses, also known as high performance serial bus (HPSB)

References

- Hutchinson, S. E., & Sawyer, S. C. (2013). *Computers: The user perspective.* Boston: Irwin McGraw-Hill.

- O'Leary, T. J., & O'Leary, L. I. (2014). *Computer Today*. Boston: McGraw Hill.

- Williams, B. K., & Sawyer, S. C. (2014). *Using Information Technology: A practical introduction to computers and communications (11th ed.).* McGraw-Hill Education.