ASSIGNMENT

SUBMITTED BY,

ASHTAMI PRASAD

MCA REGULAR

BATCH A

ROLL NO:29

COMPUTER HARDWARE:

Computer hardware refers to the physical elements of a computer.This is also sometime called the equipment of the computer.Hardware represent the physical and tangible components of a computer ,that is the component that can be seen and touched.It encompasses everything with a circuit board that operates within a pc or laptop.Computer hardware can be categorized as having either internal or external components.

- Internal component include items such as th motherboard,central processing unit(cpu),random access memory(RAM),hard drive,optical drive,heat sink,power supply,transistors,chips,graphics processing unit(GPU),network interface card(NIC) and universal serial bus(USB) ports.These components collectively process or store the instructions delivered by the program or operating system(OS).

- External components also called peripheral components, are those items that are often connected to the computer in order to control either its input or output. Common input component include a mouse,keyboard,microphone,camera,touchpad,stylus,joystick,scanner,USB flash drive or memory card.Monitors, printers,speakers,headphones and earphones/earbuds are all examples of output computer hardware.

Internal component:

- ✓ Motherboard

    The motherboard is at the center of what makes a PC work.It houses the CPU and is a hub that all other hardware runs through .The motherboard acts as a brain :allocating power where it's needed,communicating with and coordinating across all other components-making it one of the most important pieces of hardware in a computer.

    When choosing a motherboard,it's important to check what hardware ports the motherboard supplies.It's vital to check how many USB ports,and what grade they are,as well as what display ports are used and how many of each there are.

    Although the motherboard   is just one piece of circuitry,it is home to another one of the most important pieces of hardware :the processor.

- ✓ CPU(Central Processing Unit)

    The CPU(Central Processing Unit) is responsible for processing   all information from programs run by your computer.The clock speed or the speed at which the processor processes information,is measured in gigahertz(GHz).This means that a processor advertising a high GHz rating will likely perform faster than a similarly specified processor of the same brand and age.

- ✓ RAM(Random Access Memory)

    Random Access Memory or RAM is hardware found in the slots of the motherboard.The role of RAM is to temporarily store on the fly information created by programs and to do so in a way that makes this data immediately accessible.The tasks that require random memory could be rendering images for graphic design ,edited video or photographs ,multi tasking with multiple apps open.

- ✓ Hard Drive

    The hard drive is a storage device responsible for sorting permanent and temporary data.This data comes in many different forms,but is essentially anything saved or installed to a computer.There are two different types of storage device :traditional hard disk drive(HDD) and the newer solid state drives(SSD).Hard disk drive work by writing binary data on to spinning magnetic disks called platters that rotate at high speeds, while a solid state drive stores data by using static flash memory chips.

- ✓ Graphics Processing Unit(GPU)

    A programmable processor specialized for rendering all images on the computer's screen. A GPU provides the fastest graphics processing, and for gamers, the GPU is a stand-alone card plugged into the PCI Express bus. GPU circuitry can also be part of the motherboard chipset or on the CPU chip. A GPU performs parallel operations. Although it is used for 2D

data as well as for zooming and panning the screen, a GPU is essential for smooth decoding and rendering of 3D animations and video. The more sophisticated the GPU, the higher the resolution and the faster and smoother the motion. GPUs on stand-alone cards include their own memory, while GPUs built into the chipset or CPU chip share main memory with the CPU.

✓ Power Supply

The power supply converts the power from the outlet into usable power for the other components inside the computer.Typically ,more power is needed to run more complex system.

✓ Chip

A small piece of semiconducting material on which a integrated circuit is embedded.A typical chip is less than square inches and can contain millions of electronic components.Computer consist of many chips placed on electronic boards called printed circuit boards.

External components:

✓ Monitor

The computer's monitor or screen is the window into the workings of the computer.Its visual display allows for a visual interpretation of all that is happening.There are two major forms of computer monitor .The first is the CRT ,which projects the picture from behind the screen and is therefore very bulky and

heavy. The second is LCD,which uses liquid crystals and electronic triggers to display images,allowing for a much more sleek and lightweight unit.

- ✓ Keyboard

  The keyboard allows typed input into the computer.It has buttons for all the letters of the alphabet as well as numbers,symbols and special function keys.Some keyboards,especially on macintosh computers,have USB ports available on them for easy access.

- ✓ Mouse

  The mouse allows movement of the cursor on the sreen.It allows the selection of icons and links much more quickly and smoothly than keyboard.

- ✓ Printers and Scanners

  Printers and scanners although not necessary for the overall function of a computer, are helpful tool that allow for document management,whether that be uploading a document into the computer using the scanner and print a document using the printer.

HARDWARE VIRTUALIZATION

Hardware virtualization is the abstraction of physical computing resources from the software that uses the resources .This is made possible by a virtual machine (VM) manager called a hypervisor.Essentially the hypervisor creates virtual versions of internal hardware so that

resources can be shared and used more efficiently.In cloud computing ,hardware virtualization is often associated with infrastructure as a services(IaaS).

IaaS is a delivery model for providing hardware resources over high-speed internet.In the IaaS model,a cloud provider hosts hardware components that are traditionally present in an onpremises data center, including servers,storage and networking hardware,but unlike a hardware as a services(HaaS) provider ,an IaaS provider will also host the software that makes virtualizatiom possible.Typically,an IaaS provider also supplies a range of services to accompany infrastructure components.These can include detailed billing,monitoring,log access ,security,load balancing and clustering as well as storage resiliency such as back up,replication and recovery.

OPERATING SYSTEM:

An Operating System (OS) is an interface between a computer user and computer hardware.A operating system is a software which performs all the basic tasks like file managemet ,memory management ,process management,handling input and output , and controlling peripheral devices such as disk drives and printers.

Some polpular Operating Systems include Linux operating system,windows operating system,VMS,OS/400,AIX,z/OS,etc.

History Of OS

- Operating systems were first developed in the late 1950s to manage tape storage
- The General Motors Research Lab implemented the first OS in the early 1950s for their IBM 701
- In the mid-1960s, operating systems started to use disks
- In the late 1960s, the first version of the Unix OS was developed
- The first OS built by Microsoft was DOS. It was built in 1981 by purchasing the 86-DOS software from a Seattle company
- The present-day popular OS Windows first came to existence in 1985 when a GUI was created and paired with MS-DOS.

Types of Operating System:

- Batch Operating System
- Multitasking/Time Sharing OS
- Multiprocessing OS
- Real Time OS
- Distributed OS
- Network OS
- Mobile OS

Batch Operating System

Some computer processes are very lengthy and time-consuming. To speed the same process, a job with a similar type of needs are batched together and run as a group.

The user of a batch operating system never directly interacts with the computer. In this type of OS, every user prepares his or her job on an offline device like a punch card and submit it to the computer operator.

Multi-Tasking/Time-sharing Operating systems

Time-sharing operating system enables people located at a different terminal(shell) to use a single computer system at the same time. The processor time (CPU) which is shared among multiple users is termed as time sharing.

Real time OS

A real time operating system time interval to process and respond to inputs is very small. Examples: Military Software Systems, Space Software Systems are the Real time OS example.

Distributed Operating System

Distributed systems use many processors located in different machines to provide very fast computation to its users.

Network Operating System

Network Operating System runs on a server. It provides the capability to serve to manage data, user, groups, security, application, and other networking functions.

Mobile OS

Mobile operating systems are those OS which is especially that are designed to power smartphones, tablets, and wearables devices.

Some most famous mobile operating systems are Android and iOS, but others include BlackBerry, Web, and watchOS.

Some of important functions of an operating system

✓ **Memory management**

Memory management refers to management of Primary Memory or main memory.Main memory is a large array of words or bytes where each word or byte has its own address.

Main memory provides a fast storage that can be accessed directly by the CPU.For a program to be executed,it must in the main memory.An operating System does the following activities for memory management:-

- Keeps tracks of primary memory ,that is ,what part of it are in use by whom,whwt part are not in use.
- In multiprogramming ,the os decides which process will get memory which and how much.
- Allocate the memory when a process request it to do so.
- De allocate the memory when a process no longer needs it or has been terminated.

✓ **Processor Management**

In multiprogramming environment, the OS decides which process gets the processor when and for how much time.This function is called process scheduling.An operating system does the following activity for processor management system:-

- Keeps tracks of processor and status of process.The program responsible for this task is known as traffic controller.
- Allocates the processor(CPU)to a process.
- De-allocates processor when a process is no longer required.

✓ **Device Management**

An operating system manages device communication via their respective drivers.It does the following activities for device management:-

- Keeps tracks of all dvices .Program responsible for this task is known as the I/O controller.
- Decides which process gets the device when and for how much time.
- Allocates the device in the effient way.
- De-allocates devices.

✓ **File Management**

A file system is normally organized into directories for easy navigation and usage.These directories may contain files and other directions.

An operating system does the following activities for the file management:-

- Keeps track of information ,location,usage,status etc.The collective facilities are often known as file system.
- Decides who gets the resources.
- Allocate the resources.
- De-allocates the resources.

✓ **Other Important Activities**

Following are some of the important activities that an Operating System performs:-

- **Security**

By means of password and similar other techniques,it prevents unauthorized access to programs and data .

- **Control over system performance**

Recording delays between request for a service and response from the system.

Advantage of using Operating System

- Allows you to hide details of hardware by creating an abstraction
- Easy to use with a GUI
- Offers an environment in which a user may execute programs/applications
- The operating system must make sure that the computer system convenient to use

- Operating System acts as an intermediary among applications and the hardware components
- It provides the computer system resources with easy to use format
- Acts as an intermediator between all hardware's and software's of the system

Disadvantages of using Operating System

- If any issue occurs in OS, you may lose all the contents which have been stored in your system
- Operating system's software is quite expensive for small size organization which adds burden on them. Example Windows
- It is never entirely secure as a threat can occur at any time