**HND Unit - 8 : Computer Systems Architecture**

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**OPERATING SYSTEMS**

Technical Evaluation Report

horizontal line

# Image result for operating system

# Introduction

The purpose of this report is to judge the structure associated functions of an software system, as well as memory, processor, devices, file, security, performance a blunder management with regards to practicality, operation and dependency.

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## What is an Operating systems ?

Operating system is a software that allows users to communicate with the hardware. It is an essential software which is required to perform basic low level programming. It can also be used to perform tasks such as scheduling tasks and controlling peripherals.

***"An operating system (or 'OS') controls the general operation of a computer, and provides an easy way for us to interact with computers and run applications."***

**BBC Bitesize. (2018). *BBC Bitesize - GCSE Computer Science - Operating systems - Revision 1*. [online] Available at: https://www.bbc.com/bitesize/guides/ztcdtfr/revision/1 [Accessed 16 Nov. 2018].**

## Operating systems and its Structure & Functions with regards to functionality, operation and dependency.

An operating systems has to follow a specific structure and function, the functions for an operating system are listed below :

* **Memory -**

This is responsible for sharing the physical memory of the computer between processes and handling programs which require more memory than physically available.

* **Structure** -

**Primary Storage** -

This is the part of the system where the information is kept for immediate access by the system’s processor. It uses RAM which stands for Random Access Memory, which is regularly used by the hardware storage system.

**Secondary Storage** -

This is the part of the system where the softwares and programs information are stored for a long time and are essential for the system. For Example the main memory and optical drives, hard drives are stored within the system.

* **Function** - .

The memory is the systems primary memory in an operating system which makes sure that the memory is available or used in the memory location.

* **Functionality, Operation and dependency** -

Memory is that the practicality of associate degree software that handles or manages primary memory and moves processes back and forth between main memory and disk throughout execution.

* **Processor -**

The electronic equipment of a pc is additionally called the CPU, or “central process unit”. This processor handles all the essential system directions, like process mouse and keyboard input and running applications.

* **Structure -**

**Arithmetic Logic Unit (ALU) -** It also it the foundation of the CPU. It calculates by performing operations which are logical.

**Control Unit -**

It provides directions to the processor by giving directions to the arithmetic unit and other input devices and output devices on what has to be done.

**Registers -**

The register is a part of the processor which contains a set of data which calculates processors. It can contain any amount of data or instructions which mentions the registers as a form of instruction.

* **Function** -

The functions of a processor are write-back , execute, decode and fetch. The main component of a processor is the ALU which holds the logical and mathematical calculations in the form of instructions

* **Functionality, Operation and dependency** -

The primary works is done by the system in the back end. The input data is taken by the control unit and produces the output data. This is the CPU where instructions is stored and executed with complex calculations and makes the decisions for the system.

* **Devices -** Five most common operating systems are Microsoft Windows , Apple mac OS, Linux, Android and Apple OS.
* **Structure -**

**One task operating systems -**

It makes the user do a single task at once. For example , for it is the operating system in a PDA (Personal digital assistants) which is a handheld system.

**Real-time operating systems (RTOS) -** This is an operating system which controls machines, instruments which are scientific, systems in the industry. There is no control by the user as the RTOS has the majority functions promed by it.

**Multi-tasking operating systems -**

This can perform multiple tasks on a system, by an individual user. These are usually common in every households such as PCs, Laptops, having Windows OS , Mackintosh OS, Linux OS, etc, are well known operating systems have this features.

**Multi-user operating systems** -

This can be used by several individuals at the same time which use data on the current system itself. For example the operating system, Unix has this kind of feature.

* **Function -**

The operating system interacts with the device drivers for peripheral control. In very small embedded systems, the device management routines may be included within the OS.

* **Functionality, Operation and dependency** -

The device management has the following functions :

* It installs devices and their drivers which are linked with other softwares
* It allows devices to be compatible with other hardware devices by configuring them.
* The device manager also provides security and process which protects the devices in the system.
* **File -**

The file is a data structure that is used in the operating system to make sure all the files are in order on the system. It also means that the files which are in the disk partition also store files in the system files.

* **Structure -**

The operating system can be used to arrange the data in the system into categories for all the files datas, the folders for the files, devices and drives, and helps locate them easily.

* **Function -**
* **Read -** It reads permission to allow a user to open and read a file or directory.
* **Write -** It writes permission to allow you to open the file or directory, make changes, and save those changes.
* **Delete -** It deletes permission to allow you to delete the file or directory.
* **Execute -** It executes permission to allows you to run an executable file are executable files, usually ending in .exe or .com which starts an application on your computer.
* **Functionality, Operation and dependency** -
* **File Creation -**

The first step is to create a file, if there is no file created then there can’t be any operation to be performed.

* **File Deletion operation -**

If a file is not required then it should be deleted to increase storage. This is the final step of a file, thereafter, it no longer exists.

* **File Opening operation -**

This is the process where the file before it opens must initialise to make to file usable.

* **File Closing Operation -**

In this process the file closes to make space in the internal storage, the details of the file address and the attributes will not be required.

* **File Reading Operation -**

This process is performed to read the information stored in the system data which are required.

* **File Writing Operation -**

This process is used to write the information into the file, which is located in the same folder.

* **File Appending Operation -**

This process is similar to the file writing but this operation inserts an additional data which is at the end of the file as an extension.

* **File Seeking Operation -**

This process for searches any files requires a method which shows how to get the data from, so this process performs the task for it.

* **File Getting attribute Operation -**

This process is required when the system needs to read file’s attributes which allows them to get on with their work.

* **File Setting Attribute Operation -**

This process is used to set attributes after when the file is created.

* **File Renaming Operation -**

This operating is used to change the name of the file of the current file, this is the renaming operation.

* **Security -**

Security is that the type of protective the pc which incorporates softwares, memory, hardware and necessary information that is needed to perform tasks, from malicious programs to keep up a stable system by eliminating errors.

* **Structure -**
* The initial stage of a security system starts when the operating system is installed.
* An essential system is created on a secure network to avoid being hacked.
* When an operating system is first installed it should contain files which are required for the system, with software which are only essential for the system to function.
* The booting process should be protected from any malicious programs and errors.
* While installing drivers which are usually issued by third party suppliers, which must be carefully selected as this is initialised with access .
* **Functionality, Operation and dependency** -
* The planning of a system must recognise the requirements of a system to support the functions given, by removing unnecessary softwares which are not beneficial in improving security.
* While installing the operating system it is not recommended to select the default installation , instead it should be personalised to the requirements of the user and the necessary files to be installed.
* There are lots of guides regarding files, protocols, services and applications, and protocols which should not be installed when they are not necessary for the system.
* Before installing unnecessary softwares it is better to read the preferences and then deleting the software if it is not required in the future but by doing so partially uninstalling the software and not removing it fully from the system.
* If the system is hacked and has access to the system, the hacker might change setting to their liking to harm or steal crucial data from the system.
* By not giving access for unnecessary softwares to other users can be effective if it is not accessible by everyone.

* **Performance -**

Performance monitoring of operating systems and process is essential for debugging processes and systems, effectively manage system resources making system decisions, and evaluating and examining systems.

* **Structure -**

**Real Time operating system -**

It is where the data is taken in real time and processes within the system when an input is given within seconds. It calculates the amount of time required after the input is given and then displayed by updating the data on the display.

* **Hard real-time systems -**

It makes sure that the important tasks are done on time, in these systems the information is stored in the ROM, and the backup storage may not be available or in limited quantities. These systems may not have virtual memory.

* **Soft real-time systems -**

It is a bit flexible as more important tasks gets importance first and holds it till it gets completed. These systems have less equipments than hard real time systems. For eg. Virtual reality.

* **Functionality, Operation and dependency** -
* The codes necessary for the software program is located on the system hard drive.
* A part of the memory RAM is kept aside for the software program and other information space is reserved.
* The area in the memory is kept aside in the storage for the code of the program.
* The instructions for the program is initialised within the memory of the CPU and the process begins.
* **Error management -**

It is the process of resolving issues by performing maintenance to fix those issues in the system softwares on the system.

* **Structure -**

The different types of errors are :

* Logical errors
* Generated errors
* Compile-time errors
* Runtime errors
* **Functionality, Operation and dependency** -

The error management in hardwares and softwares issues swiftly, it clears interrupts and continues the activities. The programmer develops a program to take care of the error issues and directs the software to overcome the issues.

### Conclusion

An operating system can include memory, processor, devices, file, security, performance, and error management.

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