

CHAPTER FIVE (5)

INTRODUCTION TO COMPUTER SOFTWARE

LESSON OBJECTIVES

The student will be able to:

- Distinguish among the various types of computer software
- Discuss the types of Operating System
- Explain the functions of the Operating System (OS)
- Identify and state the uses of Utility Programs.
- Distinguish among the different types of Application software.
- Discuss the functions of the Application software

COMPUTER SOFTWARE

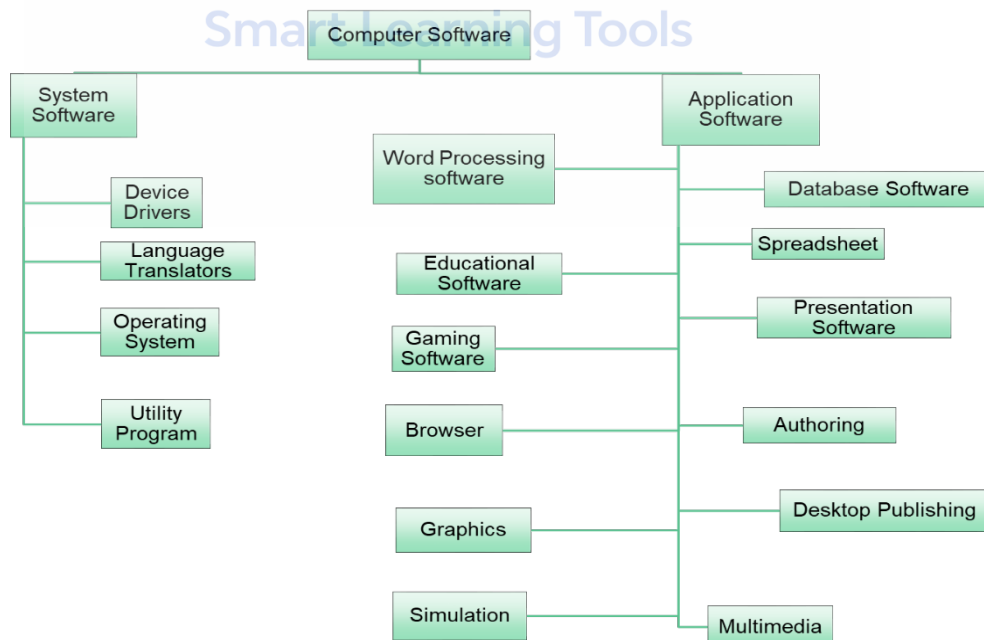
Computer software (otherwise, software) is a collection of computer instructions and related data that tells the computer how to perform a task.

Computer software is also a collection of instructions that enable the user to interact with a computer, its hardware, or perform tasks.

Software is the general name given to all the programs (sets of instructions) that computers use to perform different task.

CLASSIFICATION (TYPES) OF COMPUTER SOFTWARE

1. System Software
2. Application Software



SYSTEM SOFTWARE

System Software is a set of programs that help run the computer and coordinate instructions between application software and the computer's hardware devices.

System Software is designed to provide a platform to other software. Examples of System Software are:

- Operating Systems
- Utility Programs
- Device Drivers
- Language Translators

Operating System (OS)

OS is the main software that controls how a computer system functions and manages the computer's hardware including processor, memory, and storage devices as well as peripheral devices.

OS provides a consistent means for applications software to work with the CPU and it is responsible for the management, scheduling, and coordination of tasks as well as system maintenance.

Without a computer operating system, a computer and software programs would be useless.

Examples of Operating Systems

- Windows Vista, Windows 7, Windows 8, Windows 10
- macOS
- Ubuntu Linux
- Google android (phones & tablet)
- iOS (for iPhone & iPad)
- Chromium (Chromebook), etc.

Types of Operating Systems

a. Single user (Personal user) Operating System

It is an operating system designed for one user to use a computer at a time and that works on desktop computer, notebook computer, or mobile computing device. E.g., Windows 7,8,10, MacOS, Linux, etc. It allows multi-tasking means can run more programs simultaneously that is same time. For instance, a user can launch and work on Word application and at same time work on PowerPoint or even play game.

b. Multi-user Operating System

Multi-user O.S allows multiple users on different computers or terminals to access a single system with one OS on it. It ensures that the requirement of various users is balanced and that each of the programs they are using has sufficient and separate resources so that a problem with one user doesn't affect the entire community of users. E.g., UNIX, PC-MOS (Multi-User Operating System), Linux.

c. Network Operating System (N.O.S)

N.O.S runs on a server and provides the server the capability to manage data, users, groups, security, applications, and other networking functions. N.O.S primary purpose is allow communicating and sharing resources such as files, printers, etc. among multiple computers. E.g., NetWare, Windows Server 2003/2008, Solaris, UNIX, Linux, Mac OS X, etc.

d. Single programming O.S

SPOS allows only one program to run at a time.

e. Multi-programming O.S

MPOS execute multiple programs on the system at a time. The CPU in MPOS never get idle, because multiple programs. It executes on the system and users can interact with the system.

f. Distributed O.S

Distributed OS manages a group of distinct computers and makes them appear to be a single computer. The development of networked computers that could be linked and communicate with each other gave rise to distributed computing.

g. Real-Time O.S

RTOS is defined as data processing system in which the time interval required to process and respond to inputs is so small that it controls the environment. RTOS must have well-defined, fixed time constraints, otherwise the system will fail. E.g., scientific experiments, medical imaging systems, industrial control systems, robots, air traffic control, etc.

Functions of the Operating System

The functions of an operating system depend on the size and complexity of the computer system.

It may also depend on whether the system is a single user system such as a PC or a Multi-Access System such as mainframe or network.

A multi-access system is one where the terminals and the computer are linked interactively.

Roles or functions of the Operating System

a. Management of the Processor

Operating System is responsible for managing allocation of the processor between the different programs using a scheduling algorithm. The type of scheduler is totally dependent on the operating system, according to the desired objective.

b. Management of the Random Access Memory

The operating system is responsible for managing the memory space allocated to each application and, where relevant, to each user. If there is insufficient physical memory, the operating system can create a

memory zone on the hard drive, known as "**virtual memory**". The virtual memory lets you run applications requiring more memory than there is available RAM on the system. However, this memory is a great deal slower.

c. Management of Input/Output

The operating system allows unification and control of access of programs to material resources via drivers (also known as peripheral devices or input/output devices). Or helping to coordinates and manipulates computer hardware, such as computer memory, printers, disks, keyboard, mouse, etc.

d. Management of Execution of Applications

The operating system is responsible for smooth execution of applications by allocating the resources required for them to operate. This means an application that is not responding correctly can be "killed".

e. Management of authorizations

The operating system is responsible for security relating to execution of programs by guaranteeing that the resources are used only by programs and users with the relevant authorizations.

f. File Management

An operating system contains file management programs that provide the ability to create, delete, enter, change, ask, and access of files of data. They also produce reports on a file. It monitors and organizes files on a variety of storage media, such as floppy disk, hard drive, compact disc, digital video disc, and tape.

g. Information Management

The operating system provides a certain number of indicators that can be used to diagnose the correct operation of the machine. That is by managing hardware errors and the loss of data.

h. User Interface

It is a function of an operating system that allows users to interact with a computer. A user interface program may include a combination of menus, screen design, keyboard commands. A well-designed user interface is essential for an operating system to be popular. Because of the function, users can load programs, access files, and accomplish other tasks.

Overview functions of the Operating System

- a.** Starting a computer
- b.** Providing a User Interface
- c.** Managing Programs (Computer Resources)
- d.** Managing Files and Memory
- e.** Scheduling Jobs
- f.** Configuring Devices
- g.** Establishing an Internet Connection
- h.** Monitoring Performance

Utility Software

Utility software is a kind of system software designed to help analyse, configure, optimize and maintain the computer.

A single piece of utility software is usually called a **utility or tool**. Utility software has long been integrated into most major operating systems. Utility Programs are used for the management of computer systems and also perform maintenance types tasks.

Examples of Utility Programs and their Uses

Utility Program	Uses
File Viewer	It used for viewing and managing files in a computer system. Example Windows Explorer.
File Compressor	It used to shrink the size of files. The compressed file is sometimes called a zipped file.
Diagnostic Utilities	It used to detect problems of hardware and software.
Disk Scanner	It used to detect the physical and logical problems of a disk.
Antivirus	It used to prevent, identify and eliminate viruses from the computer. Examples McAfee, AVG Antivirus, Norton Antivirus, and Doctor Solomon's Antivirus
Disk Defragmenter	It used to recognize the files on the disk. It also manages the unused space on the disk so that the OS may use data more quickly.
Backup Utility	It used to make the backup of data and files.
Data Recovery Utility	It used to restore the data that has been damaged or corrupted.

Device Driver

A **device driver** is a software or program that links a peripheral device (hardware) to the operating system. It acts like a translator between a device and the applications that use it. In other words, **device driver** is a program that controls a particular type of device that is attached to your computer. There are device drivers for printers, displays, CD-ROM readers, diskette drives, video adapters, network cards, sound cards and modems, etc.

NB: OS can include device drivers for basic components, like the mouse and keyboard, while peripheral manufacturers often provide discs with drivers for users to install with their hardware.

Language Translator

It is another system software which **convert the high-level language to machine level language for the purpose of machine understanding**.

The Machine can only understand the machine level language or binary language 0's & 1's. The language translator rectifies the errors within the program through different ways.

There are 3 types of language translator:

- a. **Compiler** - a computer program that converts another program from a high-level language into machine language.
- b. **Interpreter** - a computer program that translates instructions in a program written in a high-level computer language into machine language and executes them.
- c. **Assembler** - a computer program that converts assembly language into machine language.

APPLICATION SOFTWARE

An **application software** (app or application for short) is a computer software designed to perform a group of coordinated functions tasks, or activities for the benefit of the user.

Application software is also known as end user software. They are normally designed to solve a particular problem, to perform useful work on specific tasks or to provide entertainment.

Examples include

- Word processing software like Microsoft Word, WordPad, etc.
- Spreadsheets like Excel or Lotus 123,
- Presentation Software
- Educational application,
- web browser
- Desktop publishing, etc.

Types of Application Software

1. Productivity – Word Processing, Spreadsheet etc.
2. Education/Reference – e-books, e-libraries etc.

Functions of Application Software

a. **Word Processing Software**

This software enables the users to create, manipulate text and edit documents. The most popular examples are MS-Word, WordPad, Notepad and some other text editors.

b. **Database Software**

Database is a structured collection of data organized in such a way that a program can quickly select piece of data. A computer database relies on database software to organize the data and enable the database users to achieve database operations. Database software allows the users to store and retrieve data from databases. Examples are Oracle, MS Access, etc.

c. **Spreadsheet Software**

Spreadsheet software is application in which data is arranged in the rows and columns of a grid and perform calculations. They simulate paper worksheets by displaying multiple cells that make up a grid. Examples are Excel, Lotus 1-2-3 and Apple Numbers, etc.

d. Educational Software

These are software designed for educational purposes.

- It has the capabilities of running tests and tracking progress.
- It also has the capabilities of collaborative software.
- It is often used in teaching and self-learning

Examples are Encarta Encyclopaedia, Mavis Beacon Teaches Typing, Longman multimedia dictionary, Typing Tutor, etc.

e. Presentations Software

The software that is used to display information in the form of a slide show is known as presentation software. This type of software includes three functions, namely, editing that allows insertion and formatting of text, methods to include graphics in the text and a functionality of executing the slide shows. **Examples** are Microsoft PowerPoint, Impress, etc.

f. Entertainment Software

These are software designed for playing games (Solitaire, Pinball, Grand Theft, FIFA, etc.), video (VLC, Cyberlink Media Player, Windows Media Player, etc.), music (AIMP, Virtual DJ, Windows Media Player, etc.), etc.

g. Web Browsers

They are software that enable you to browse (surf) or go through the internet and view websites. Some common browsers include Opera, Internet Explorer, Netscape and Mozilla Firefox.

h. Authoring Software

Authoring software are special programs used to create multimedia presentations. Some of the common authoring software include Dreamweaver and FrontPage.

i. Graphic Design Software

Include Corel Draw, Freehand and Adobe Illustrator. These can be used to create graphics and colourful designs.

j. Desktop Publishing Software

Include Adobe PageMaker or QuarkXPress. These are used for making and designing books.

LESSON ASSESSMENT

OBJECTIVES

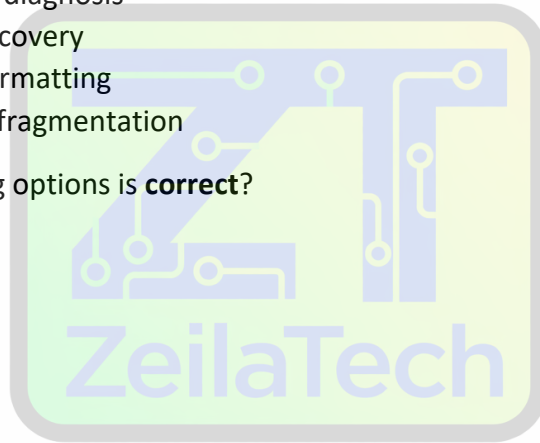
1. The following are examples of utility programs **except**
 - A. Antivirus
 - B. File maintenance

- C. Operating System
 - D. Tracing and Debugging
2. Which of the following is true of customized software?
- A. They are inexpensive
 - B. They are not fully documented
 - C. They meet the exact needs of the user
 - D. They are designed to meet the needs of many different users
3. Application software interact with the computer through the
- A. Linker
 - B. Translator
 - C. System software
 - D. User interface
4. Which of the following is **not** an example of utility program?
- A. File copying
 - B. File organization
 - C. File sourcing
 - D. Merge routine
5. Every operating system must be able to perform the following functions **except**
- A. Control resources
 - B. Reclaim resources
 - C. Distribute resources
 - D. Put resources into use
6. Tasks undertaken by system software include:
- I. Allocating system resources
 - II. Completing specific tasks
 - III. Monitoring system activities
 - IV. Disk and File management
- A. I, II, III and IV only
 - B. I, II and IV only
 - C. III and IV only
 - D. I, III and IV only
7. Which of the following utility programs is used in freeing space on hard disk?
- A. Backup
 - B. Check disk
 - C. Disk clean-up
 - D. Encryption
8. The function of disk defragmenter is to
- A. Optimize disk space
 - B. Increase space on disk
 - C. Report on status of tracks
 - D. Examine the surface of disk
9. Computer Software can be divided into
- A. Icons and folders

- B. Software and utility
 - C. Algorithm and compiler
 - D. System and application
10. Which of the following software does a computer user use to accomplish specific task?
- A. Application software
 - B. Driver software
 - C. System software
 - D. Utility software
11. Which of the following applications uses cells?
- A. QBasic
 - B. Spreadsheet
 - C. Presentation package
 - D. Communication software
12. The functions of utility software include:
- I. Slide cropping
 - II. System diagnosis
 - III. Data recovery
 - IV. Page formatting
 - V. Disk defragmentation

Which of the following options is **correct**?

- A. I, II and III only
- B. II, III and V only
- C. III, IV and V only
- D. I, IV and V only



Smart Learning Tools

SUBJECTS

1. A) Explain system software.
 - B) What is an operating system?
 - C) State two functions of an operating system.
 - D) List three examples of an operating system.
2. A) Define the following;
 - i. Device drivers
 - ii. Language Translator
 - iii. Utility Programs
- B) Differentiate between System Software & Application Software.