COMPUTER STUDIES NOTES

COMPUTER SOFTWARE
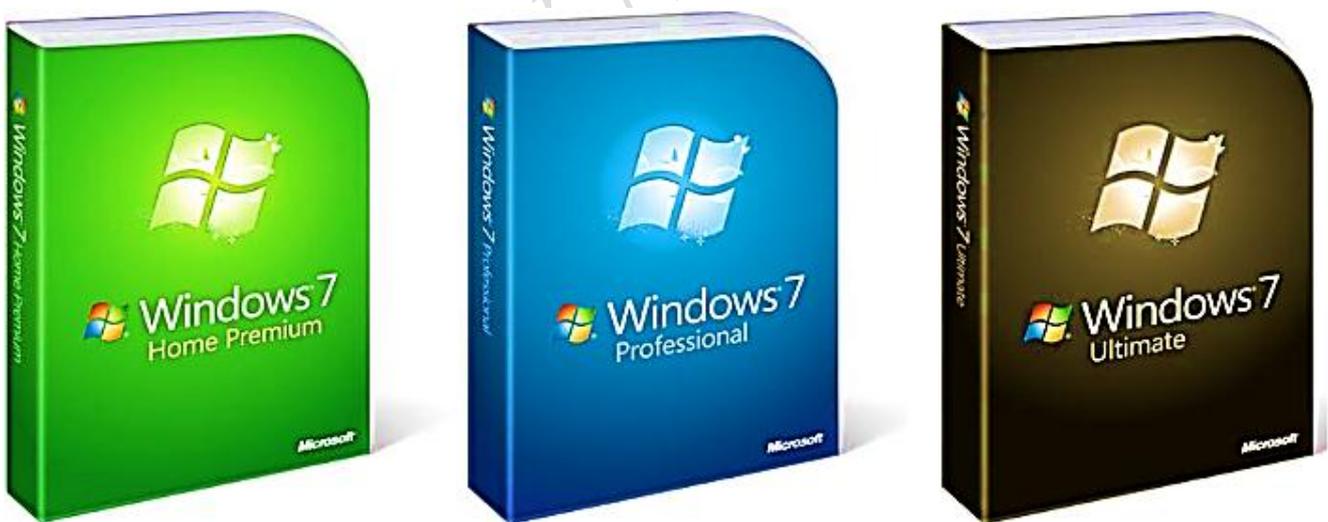
CLASSIFICATION OF SOFTWARE.

1. PURPOSE
    a. SYSTEM SOFTWARE
    b. APPLICATION SOFTWARE
2. ACQUISTION
    a. STANDARD SOFTWARE
    b. IN-HOUSE DEVELOPED SOFTWARE
3. CRITERIA FOR SELECTING A COMPUTER SYSTEM (SPECIFICATIONS)
4. SOFTWARE CONSIDERATIONS

LESSON OBJECTIVES

By the end of this lesson, the learner should be able to:-

a) Classify computer software
b) State the criteria for selecting a computer system
c) State software considerations

"If you know how to make software, then you can create big things."
~ Xavier Niel

Definition of the term Software

Software can be described as a set of computer instructions designed to handle a computer and accomplish specific tasks with the computer.

Software does nothing more than tell the computer how to accept some type of input, manipulate that input, and spit it back out again in some form that humans find useful.

Computer users (liveware) can only communicate to the hardware through a software interface as shown below;
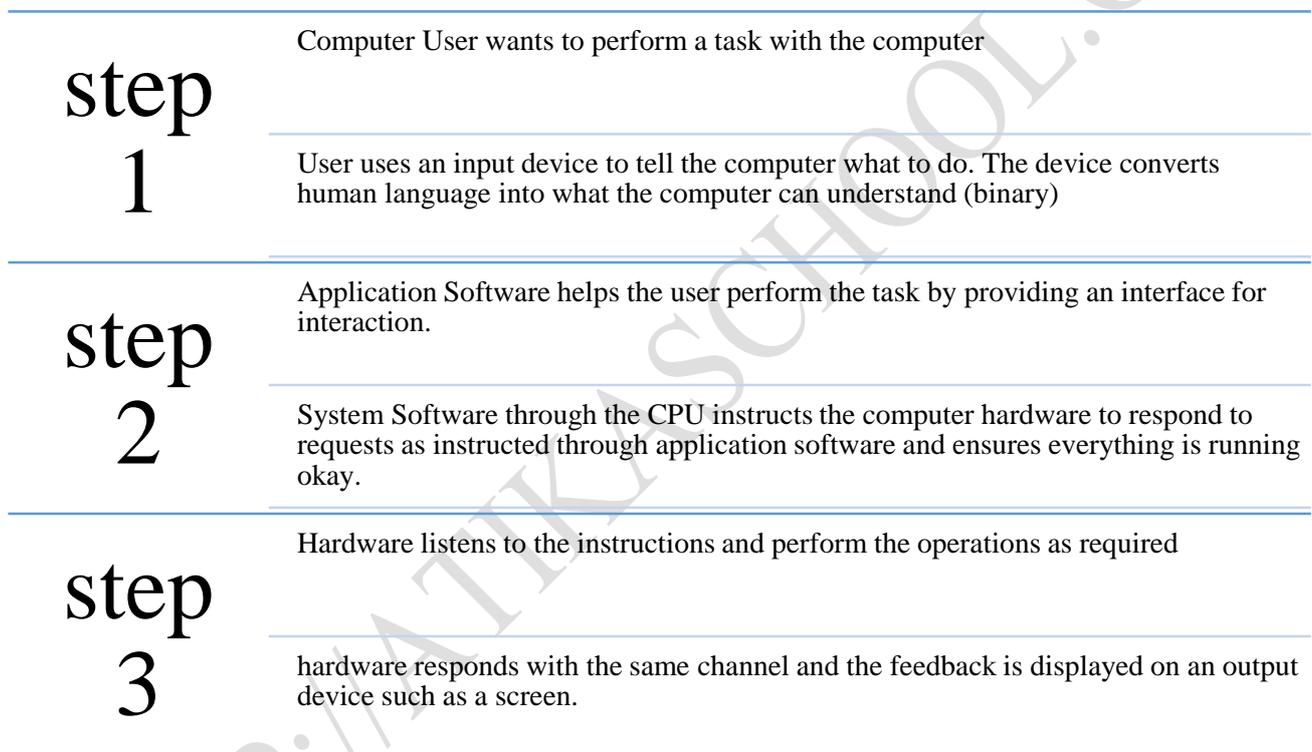
step 1	Computer User wants to perform a task with the computer
	User uses an input device to tell the computer what to do. The device converts human language into what the computer can understand (binary)
step 2	Application Software helps the user perform the task by providing an interface for interaction.
	System Software through the CPU instructs the computer hardware to respond to requests as instructed through application software and ensures everything is running okay.
step 3	Hardware listens to the instructions and perform the operations as required
	hardware responds with the same channel and the feedback is displayed on an output device such as a screen.

FIGURE 1: HOW HUMANS INTERACT WITH COMPUTERS

Classification of Computer Software

Classification of computer software is done with two major categories namely:

1. Classification according to purpose

2. Classification according to Acquisition

1) Classification according to purpose

Software can be classified in regard to what they are used for such as;

a) System software

b) Application software

System Software

System software is a program that manages and supports the computer resources and operations of a computer system while it executes various tasks such as instructing the CPU to process data and information, controlling hardware components, and facilitating users to use application software. That is, systems software functions as a bridge between computer system hardware and the application software. System software also ensures that the computer works efficiently.

Functions of System Software

a) Facilitating of the booting process.

b) Ensures that other programs are working properly.

c) Controlling of hardware devices

d) Facilitating transfer of data from one device to another.

Categories of the system software

a) Operating system

b) Firmware

c) Utility Software

d) Networking Software

Operating System

An operating system is a collection of integrated computer programs that provide recurring services to other programs or to the user of a computer. These services consist of disk and file management, memory management, and device management. In other words, it manages CPU operations, input/output activities, storage resources, diverse support services, and controls various devices.

Microsoft Windows, Android, Ubuntu, Unix, Linux, MacOS

Firmware/Stored Logic

This is the combination of persistent memory and program code and data stored permanently on electronic chips. The firmware contained in these devices provides the control program for the device. Firmware is held in non-volatile memory devices such as ROM, EPROM, or flash memory. They hold operating systems, utility programs, language processors etc.

Utility software

Utility software is designed to help analyze, configure, optimize or maintain a computer. A single piece of utility software is usually called a utility or tool. Utility software usually focuses on how the computer infrastructure (including the computer hardware, operating system, data storage and application software operates)

Networking software

This software is used to establish communication between two or more computers by linking them using a communication channel like cables to create a computer network. It enables the exchange of data in a network as well as providing data security. Networking software may come as independent software or integrated in an operating system. *Examples include:* novel Netware, windows NT etc.

Application Software

This is computer software designed to help the user perform a specific task. *Examples include* enterprise software, accounting software, office suites, and graphics software and media players.
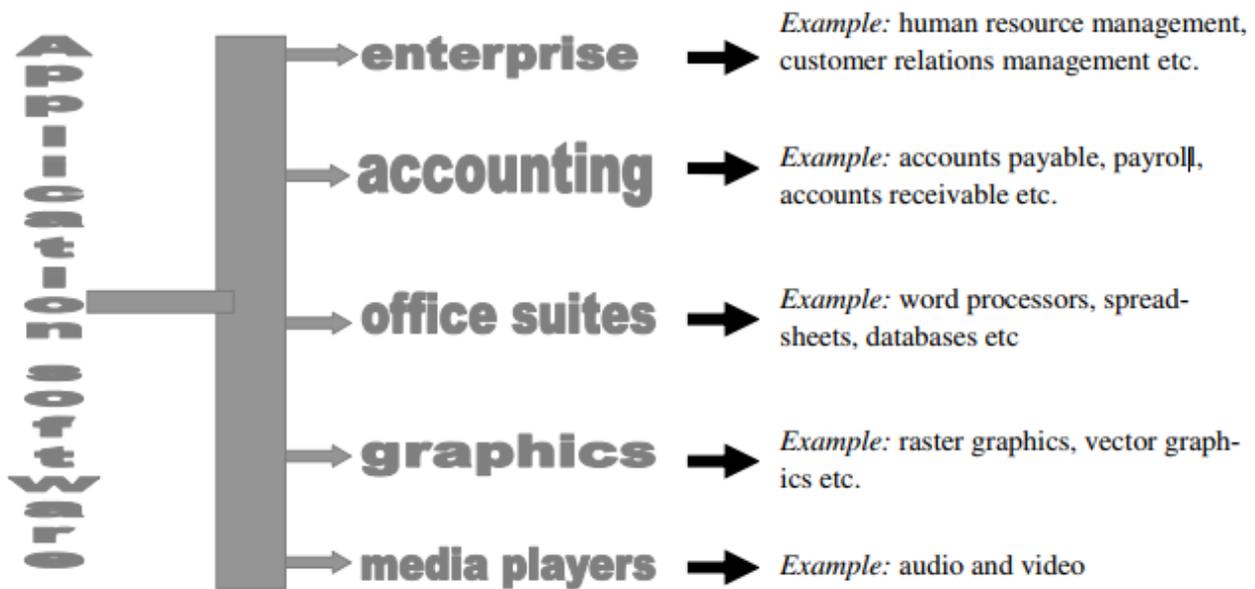
FIGURE 2: CATEGORIES OF APPLICATION SOFTWARE

Office suites

Existing office suites contain wide range of various components. Most typically, the base components include:

Word processor-allows users to create edit and save documents. Examples: Microsoft Word, open office.org, lotus word pro, word pad, libre office writer etc.

Spreadsheet- allows users to create documents and perform calculations. Examples: Microsoft Excel, Lotus 1-2-3, open office.org, VisiCalc etc.

Computer Aided Design- is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design or he process of creating a technical drawing with the use of computer software. It can also be classified as a vector graphic under graphics suite. Example: AutoCAD, PLaSM, NCLab etc.

Presentation program-allows users to create visual presentations. Example: Ms Power Point, Corel Presentations, Google Docs etc.

Database-allows users to store and retrieve vast amount of data. Example: Ms Access, MySQL, Oracle etc.

Graphics suite (raster graphics editor, vector graphics editor, image viewer- allows users to manipulate visual images on a computer. Example: Corel Draw, Photoshop, Graphic Art, Xnview, Picasa, Microsoft Movie maker etc.

Desktop publishing software-allows users to create printed materials using page layout on a personal computer. Example: Ms Publisher, Adobe PageMaker, Adobe InDesign, Corel Ventura, Adobe FrameMaker etc.

Formula editor- allows users to typeset mathematical works or formulae. Example: Aurora, Microsoft Equation Editor, MathMagic, EqualX etc.

Email client-allows users to access and manage their Email accounts. Example: GNUmail, Opera mail, Ms Outlook, Apple mail etc.

Web browsers- used for retrieving, presenting, and traversing information resources on the World Wide Web. Examples: Firefox, Opera, Google Chrome, Safari, Internet explorer etc.

Personal information manager (PIM) - used to organize personal information. A PIM tool's purpose is to facilitate the recording, tracking, and management of certain types of "personal information". Example: Windows calendar, windows contacts, Chandler, OpenIRIS etc.

2) Classification according to acquisition

Classification according to acquisition means categorizing software according to how software consumers acquire software from the market. Classification according to acquisition therefore can be done in the following ways:

In-house developed software

These are programs designed to meet a specific user's needs. In this situation, a system analyst studies an existing system (most likely manual) and together with a programmer, they make a new computerized system to fit the needs of their client.

> *For example, a school can hire a computer analyst to design a program that can be used to produce report cards.*

Vendor off-the-shelf software

This kind of software is developed by software engineers, packaged and then made available for purchase through a vendor, a distributor or directly from the developer. Several applications may be bundled together to form a suite e.g. Microsoft office, Lotus suite, Corel word perfect, quick books etc.

Advantages of standard software over in-house developed programs are:

a) They can easily be installed and run.

b) They are cheaper.

c) They can do a variety of tasks

d) They are reliable because they have minor errors in them.

e) They can easily be modified or customized to fit user needs.

f) They are compatible to a large variety of computer hardware60

Disadvantages of Off-the-Shelf software

a) Are expensive

b) Not compatible to a variety of hardware setup

c) Require large computer memories to run

d) Require extra training from basic training

e) Prone to errors

f) Have a limited number of controls therefore not so user friendly.

Other Classifications

Classification according to End-User-License:

Freeware

This is software that is available for use at no cost or for an optional fee, but usually with one or more restricted usage rights.

Shareware (also termed trialware or demoware) is proprietary software that is provided to users without payment on a trial basis and is often limited by any combination of functionality, availability (it may be functional for a limited time period only), or convenience (the software may present a dialog at startup or during usage, reminding the user to purchase it; "nagging dialogs"). Shareware is often offered as a download from an Internet website or as a compact disc included with a periodical such as a newspaper or magazine. The rationale behind shareware is to give buyers the opportunity to use the program and judge its usefulness before purchasing a license for the full version of the software. Firms with superior software thus have an incentive to offer samples, except if their product is already well known, or if they do not want to be listed in direct competition with other products on shareware repositories.

Proprietary software is computer software licensed under exclusive legal right of the copyright holder. The licensee is given the right to use the software under certain conditions, while restricted from other uses, such as modification, further distribution, or reverse engineering.

Free and open-source software (FOSS) or free/libre/open-source software

(FLOSS) is software that is both free software and open source. It is liberally licensed to grant users the right to use, copy, study, change, and improve its design through the availability of its source code.

This approach has gained both momentum and acceptance as the potential benefits have been increasingly recognized by both individuals and corporations.

Open-source software (OSS) is computer software that is available in source code form: the source code and certain other rights normally reserved for copyright holders are provided under an open-source license that permits users to study, change, improve and at times also to distribute the software.

Example: Linux

Criteria for selecting a computer system

When purchasing a computer hardware or software, consider a number of requirements necessary to fit your needs and costs.

Hardware considerations

1) **Microprocessor type and speed**- the speed and processing power of a computer depends on the type of CPU and its clock speed. Consider microprocessors with high cache memory and faster clock speeds since they can be able to run a variety of tasks without strain. Intel Duo Core and AMD Duron are the latest for PCs.

2) **Memory capacity**- Consider the capacity of your memory since higher memories creates good performance of your computer. Check whether it's static or dynamic, DDR or SDR, empty memory slots on the motherboard and whether they are up gradable with other installed modules.

3) **Warranty**- A warranty is an agreement between the buyer and the seller that spells terms and conditions of, after selling a product in case of failure or malfunction. A good warranty should cover the following:

   ✓ Scope of cover i.e. one year

   ✓ Callout response and liability agreement

   ✓ Preventive performance.

4) **Cost**- The cost of a computer system depends on:

   ✓ Processing power

   ✓ Whether it's a Branded or a clone- a clone is a hardware or software system that is designed to mimic another system whilst a branded computer is a computer whose parts are made by one company copyrighted and standardized, they are more expensive than clones but are of high quality. Examples: Dell, Acer, Compaq, HP, Apple etc.

   ✓ Size- Portable computers are more expensive than desktops because of the complexity of technology used to make them.

5) **Upgradeability and Compatibility**- Upgradeability is the ability of a system to embrace to new forms of technology available in the market and Compatibility is the ability of a system to run in more than one different system families. For example: a computer that can run on windows, MAC, Ubuntu, etc. operating systems.

6) **Portability**- Consider your user needs and decide whether you need a computer that you can easily carry from one place to another or fixed in one place. In this case, a palmtop or a laptop and a desktop are convenient respectively.

7) **User Needs**- Value your user needs and any other needs you will use this computer for. If you want a variety of tasks, then try a general purpose computer.

8) **Monitors**- Check for video adaptors, resolution, power consumption and saving, technology used to manufacture them (TFT, Gas Plasma, CRT etc.)

9) **Multimedia Capabilities** – This is the ability to support multimedia functions like: sound card, TV card, SVGA monitor, CD/DVD drives etc.

10) **Cabling**- check whether the ports are user friendly, wireless or bound and strategically positioned on the system unit which might be a tower or a desktop type.

Software considerations

a) **Authenticity** –this is the genuineness, validity and legitimacy of an item.

b) **Documentation-** Availability of user manuals prepared by the developer with details on how to install, use and maintain the software. I.e. installation guide, maintenance guide and a user guide.

c) **User needs-** User needs dictates the type of software to purchase. For example: if the user wants to type letters, memos, CVs etc. the word processors are valid.

d) **Portability-** This is the ability of the acquired software to be installed in more than one family of computer hardware. For example: if it can accept MAC computers, 32-bit, 64-bit computers etc.

e) **Compatibility and system configuration-** A software product should be compatible with the existing hardware, operating system or application programs and should be readily upgradeable.

f) **User friendliness-** this is the measure of how easily the users can be able to operate the computer.

g) **User friendly software should have WIMP**- Windows Icons Menus and pointing devices.

h) **Cost-** Consider cost effective software, i.e. the benefits should outweigh the costs.

Questions on Topic

1) Distinguish between system software and application software.

2) A firm intends to purchase new software. List three items that should accompany the software.

3) Define the term application software

4) Give **one** example of application software

5) Give **two** examples of computer aided design software.

6) Give **three** examples of network software

7) What meant by the term user-friendly as used in software development?

8) An employee in a business company is charged with the responsibility of putting the company advertisements on the Internet.

9) State the professional title of the employee.

10) Give an example of software used by this employee to carry out the above task.

11) Explain the following software terms:

    a. Portability

    b. Modularity

12) State **two** application areas of a desktop publishing software.

13) Describe the following categories of software:

    a. Firmware

    b. Proprietary software

14) Define authenticity as used in software selection

15) List **four** ways of acquiring software in an organization

16) What is meant by freeware?

17) State **two** ways of acquiring freeware

18) What is spyware?

19) State **two** reasons why an organisation may use other strategies of software acquisition other than developing their own.

20) Differentiate between hardware and software portability.

21) State **three** reasons why an organisation may opt to develop its own software in-house rather than buy off-the-shelf software.

22) State one advantage of having free suite provided with a laptop.

23) State the meaning of the term computer software.

24) List **three** factors that should be considered when developing application and give reasons why each should be considered.

25) An engineering company requires a computer system to design roads and bridges. Explain one suitable choice for software

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