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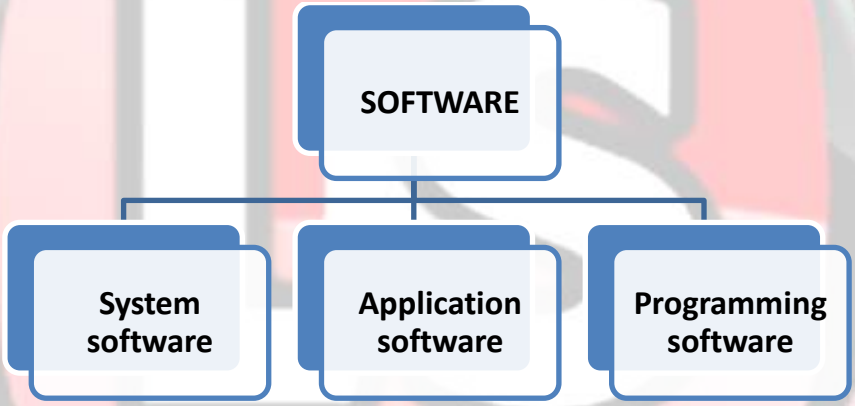
INTRODUCTION TO SOFTWARE

COMPUTER SOFTWARE

- Software is a **set of instructions, data or programs** used to **operate computers and execute specific tasks.**
- In computers, software is **loaded into RAM and executed in the central processing unit.**



SYSTEM SOFTWARE

- These software programs are **designed to run a computer's application programs and hardware**.
- It controls the **operations of the computer hardware** and provides an environment or **platform** for all the **other types of software to work in.**
- It coordinates the activities and **functions of the hardware and software.**

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COMPONENTS OF SYSTEM SOFTWARE

Operating System

- An operating system is a collection of programs **that controls the running of programs and organizes the resources** of a computer system.
- Common operating systems are **Microsoft Windows, Google's Android, Apple's iOS, Linux and Apple's macOS.**

Device Drivers

- A device driver is a special kind of software program that **controls a specific hardware device attached to a computer.**
- Device drivers help application programs and the operating system do their tasks.

Language translators

- The translator is a programming language processor that **converts a high-level or assembly language program to machine-understandable low-level** machine language without sacrificing the code's functionality.
- Language translators **allow computer programmers** to write sets of instructions in **specific programming languages**

Utility Software

- The Utility Software is system software that **helps to maintain the proper and smooth functioning of a Computer System**.
- It assists the **Operating System to manage, organize, maintain, and optimize the functioning** of the computer system.

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APPLICATION SOFTWARE

- An application program is a computer program designed to carry out a specific task.
- It includes business **software, educational software**, medical software, databases, and computer games.

PROGRAMMING SOFTWARE

- Programming software usually provides **tools to assist a programmer in writing computer programs** and software using different programming languages in a more convenient way.
- The tools include **text editors' compilers, interpreters, linkers**, debuggers, and so on.

PROGRAMMING LANGUAGES

First Generation Programming Languages

- In the computer's first generation, **programmers had to use machine language.**
- Machine language **refers to the "ones and zeroes"(11001001)** that digital processors use as instructions.
- **Machine language** is the only language that can be **understood by computer without translation.**

Second Generation Programming Languages

- Assembly languages use mnemonic **operation codes and symbolic addresses** to represent the operation codes.
- In assembly languages programmer can **use abbreviation (such as MOV A, B)** instead of having to remember lengthy binary instruction codes.

- Before they can be used by the computer, assembly languages must be translated into machine language.

Third Generation Programming Languages

- Third generation languages, also known as **high-level languages**, are very much **like everyday text and mathematical formulas** in appearance.
- It includes **ALGOL, BASIC, C, COBOL, Fortran, Java, and Pasca**.

Fourth Generation Programming Languages

- They are non-procedural languages, so named because **they allow programmers and users to specify what the computer is supposed** to do without having to specify how the computer is supposed to do it.
- It includes **Oracle Forms, Oracle Designer, PL/SQL**, Clipper, Power Builder, SAS, SPSS, SQL

Fifth Generation programming languages

- It is designed to make the computer solve a **given problem without the programmer.**
- The programmer only needs to worry about what problems need to be solved and what conditions need to be met, without worrying about how to implement a routine or **algorithm to solve them.**

CATEGORIES OF SOFTWARE

DATA BACKUP AND RECOVERY SOFTWARE

This software often supports user needs of **specifying what is to be backed up and when**.

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ORIGINAL EQUIPMENT MANUFACTURER SOFTWARE

it is a type of software that is produced by a company to be sold to **another company for use on its own products or service**s.

SHAREWARE

- This software is **downloadable from the Internet** but commonly the user is allowed to try the program for free, for a period stipulated in the license, usually thirty days.
- At the end of the trial period, the **software must be purchased or uninstalled.**

DEMO SOFTWARE

- Demo software is **not intended to be a fully functioning program**, though it may allow partial functioning.
- It is mainly designed to **demonstrate what a purchased version** is capable of doing, and often works more like an automated tutorial

FREEWARE

Freeware is also downloadable off the Internet and free of charge. freeware is only **free for personal use**, while **commercial use requires a paid license.**

PUBLIC DOMAIN SOFTWARE

This is It is the only free software that can be **legally modified by the user for his or her own purposes.**

LEARNING SESSIONS
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OPEN SOURCE SOFTWARE

- Open source software (OSS) is **software that is distributed with its source code,** making it **available for use, modification, and distribution with its original rights.**
- it includes **LibreOffice, Mozilla Thunderbird, Mozilla Firefox, VLC** Media Player.

DRIVERS OF OPEN-SOURCE SOFTWARE

- The advent of the Internet.
- Software license cost
- Flexibility
- Customer involvement
- Control

STRENGTHS OF OPEN-SOURCE SOFTWARE

- Free source code; no seat license fees; Flexible, adaptable, extensible code;
- Agility gives open-source deployments a **competitive advantage** in the **marketplace**;
- **Potential for code reuse reduces inefficiencies**; Open source typically achieves a high degree.

OPPORTUNITIES OPEN-SOURCE SOFTWARE

- Potentially **reduce project costs by building** commercial software on top of **open-source platforms**.
- Using open source can make it easier to take advantage of **external expertise, applications and code components.**

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WEAKNESSES OPEN-SOURCE SOFTWARE

- Dependency **on in-house expertise or overpriced open-source consultants**
- New versions must be **integrated and compatible rapid release** rates make this an ongoing challenge.
- **In-house staff must stay up to date** with open-source platform issues, fixes and bugs;
- Open-source **quality can vary dramatically**.

THREATS OPEN-SOURCE SOFTWARE

- In-house **experts may leave organization,** along with their intellectual capital;
- Ensuring **open-source distributions are legally licensed**.
- Spiraling **costs often** associated with **open-source maintenance**

SOFTWARE LICENSING

A software license is a document that provides **legally binding guidelines for the use and distribution of software**.

GENERAL PUBLIC LICENSE (GPL)

- It is a software copyright license **formulated and maintained** by the **Free Software Foundation**.
- It applies to some **open-source software and imposes several conditions** on both the licensor and licensee of the covered software.
- The GPL covers software that is developed and then **freely provided for use, copying, study, modification, or distribution.**

SOFTWARE ESCROW ARRANGEMENT

- A software escrow arrangement is where the **licensor of a software product agrees to place the source code** and **certain materials** relating to that software product with an **independent third party (the escrow agent).**
- The escrow agent will **only release the source code** and materials to a licensee of that software product upon the **occurrence of a release event.**

WEB BROWSERS

- A web browser **is a software application** that lets us visit web pages and access information on the **World Wide on the Internet**.
- When a **user requests some information**, the web browser fetches the data from a web server and then displays the webpage on the user's screen.
- It includes Chrome, Mozilla Firefox, Microsoft Internet Explorer and Microsoft Edge, Apple Safari and the Opera browser.

FUNCTIONS OF WEB BROWSER

- The main function is to **retrieve information from the World Wide Web** and making **it available for users**.
- When a **URL is entered in a browser**, the web server takes us to that website.
- It makes Internet surfing easy as once we **reach a website,** we can easily **check the hyperlinks** and get more and **more useful data online.**
- Browsers user internal cache which gets stored and the user can open the **same webpage time and again without losing extra data**.

- Multiple webpages can be opened at the same time **on a web browser.**

WEB APPLICATIONS

- An application program interface (API) is a piece of code that enables two software programs to communicate.
- An API specifies **how a developer should request services from an operating system (OS) or other program**, as well as how data should be exposed in various contexts and over many channels.

WORKING OF API

- To retrieve information, a **client application makes an API call**, also known as a request.
- The API makes a call to the **external program or web server** after receiving a valid request.
- The **server responds to the API** with the data that was requested.