Computer Fundamentals and Ethics
Course No: CSE 1100

Topic: Software (Part-2)

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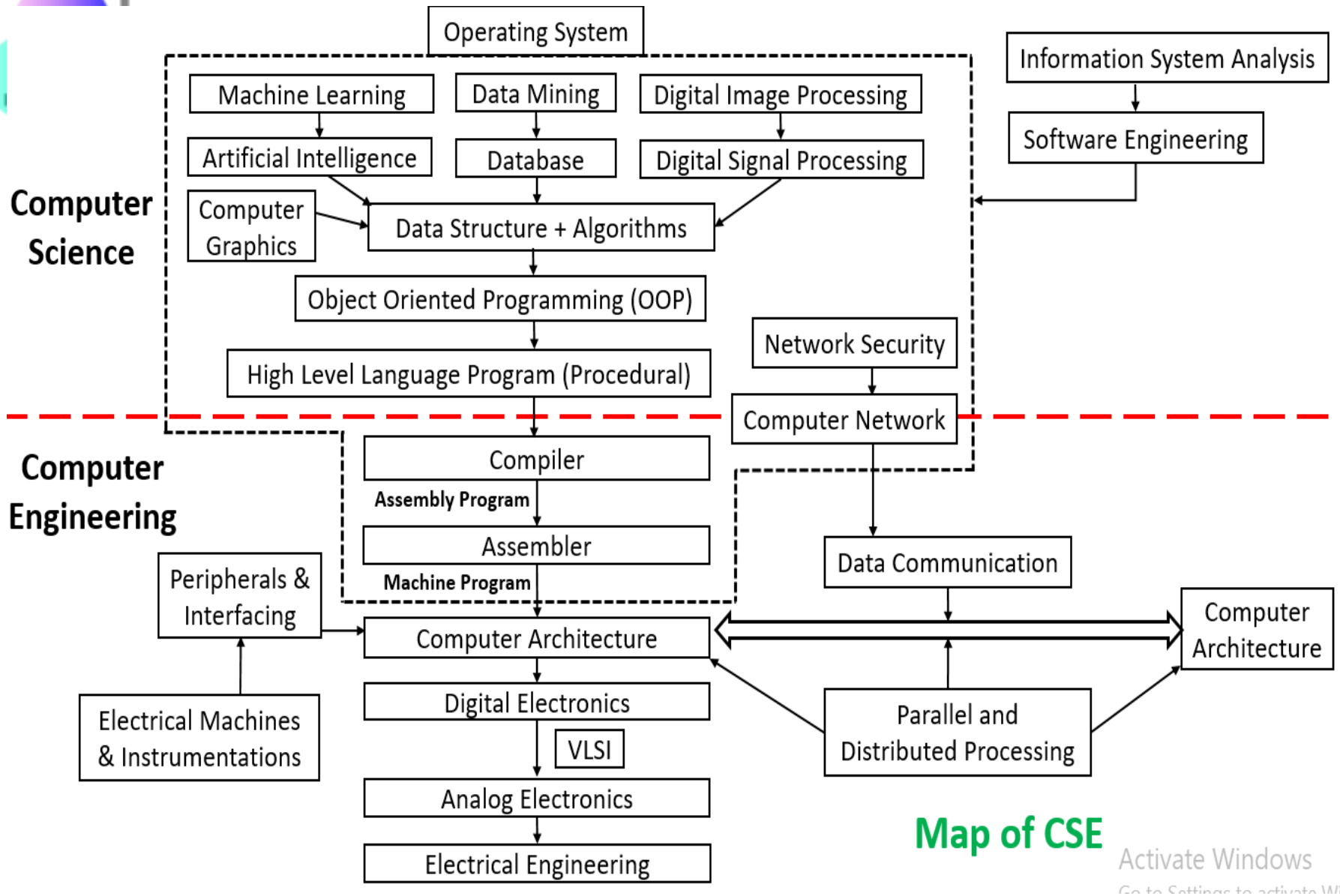


Activate Windows

Software

Software

Software:

- The programs (instructions) that tell the computer what to do.
- Computer hardware is useless without software.
- Computer software is the set of programs that makes the hardware perform a set of tasks in particular order.
- Software is developed by writing instructions in programming language.
- Software is affected by computer viruses.
- It is loaded into a computer's storage (such as a hard drive, a memory, or RAM). Once the software is loaded, the computer is able to execute the software in the Central Processing Unit.

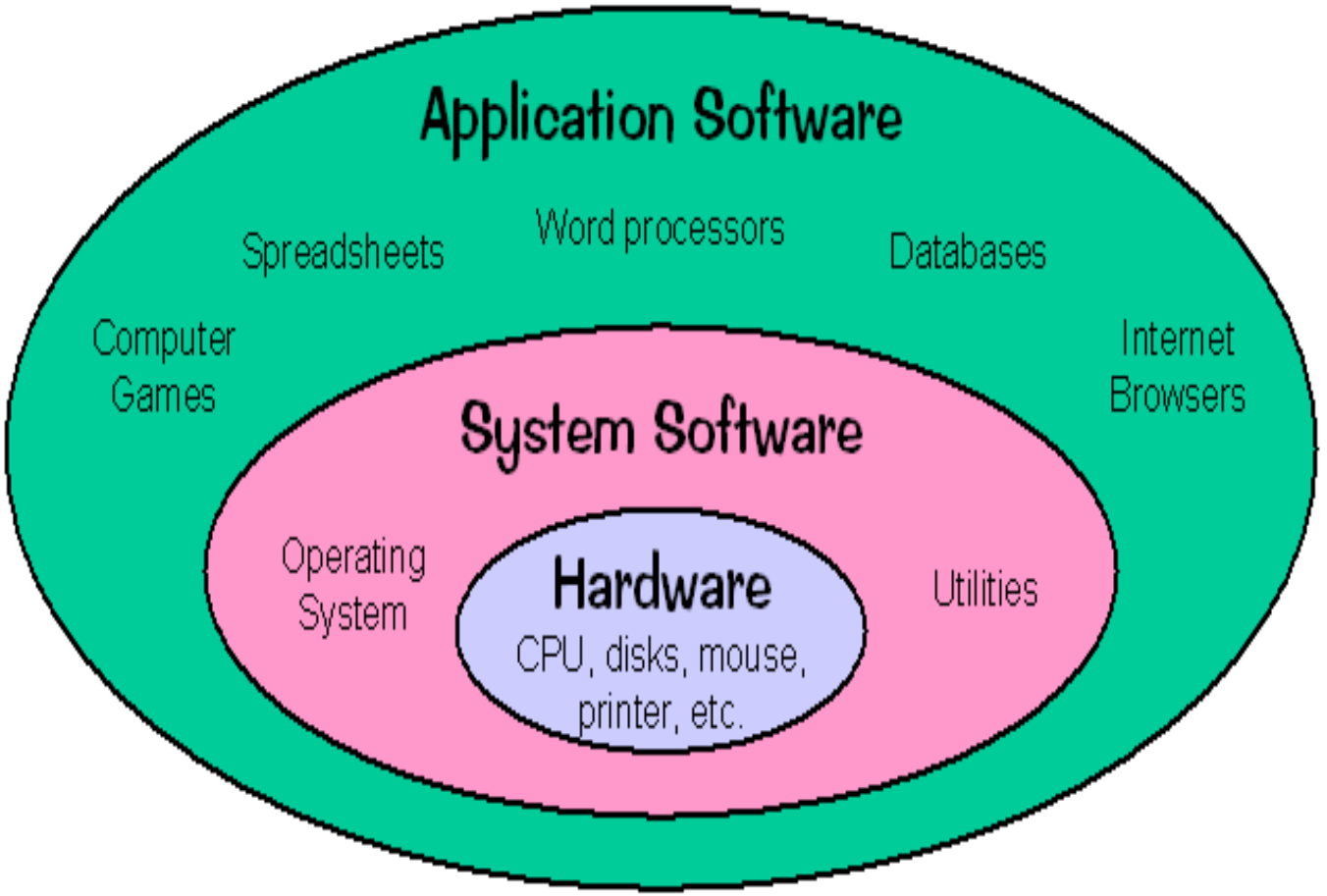
Hardware vs Software

	Hardware	Software
Definition	Devices that are required to store and execute the software.	Collection of instructions that enables a user to interact with the computer.
Types	Input, storage, processing, control, and output devices.	System software, Programming software, and Application software.
Examples	CD-ROM, monitor, printer, video card, scanners , label makers, routers , and modems.	Quickbooks, Adobe Acrobat, Winoms-Cs, Internet Explorer , Microsoft Word , Microsoft Excel
Inter dependency	Hardware starts functioning once software is loaded.	To deliver its set of instructions, Software is installed on hardware.

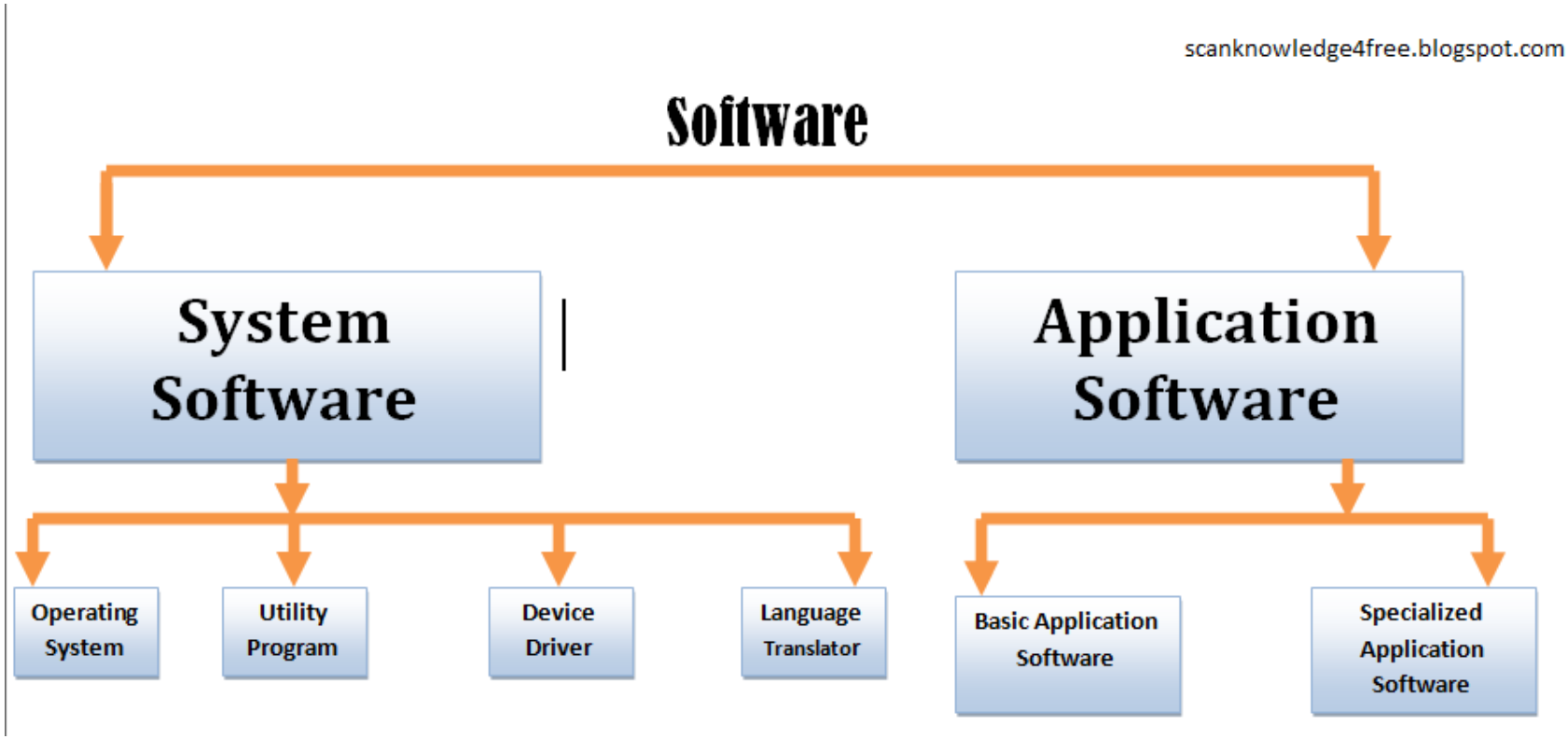
Hardware vs Software

	Hardware	Software
Function	Hardware serve as the delivery system for software solutions. The hardware of a computer is infrequently changed, in comparison with software and data, which are “soft” in the sense that they are readily created, modified, or erased on the compute	To perform the specific task you need to complete. Software is generally not needed to for the hardware to perform its basic level tasks such as turning on and responding to input.
Failure	Hardware failure is random. Hardware does have increasing failure at the last stage.	Software failure is systematic. Software does not have an increasing failure rate.
Durability	Hardware wears out over time.	Software does not wear out over time.
Nature	Hardware is physical in nature.	Software is logical in nature.

Types of Software



Types of Software



System Software

- System software is a term referring to any computer software which manages and controls the hardware so that application software can perform a task.
- Manages the fundamental operations of the computer, such as
  - loading programs and data into memory,
  - executing programs,
  - saving data to disks,
  - displaying information on the monitor, and
  - transmitting data through a port to a peripheral device.
- Without systems software installed in our computers we would have to type the instructions for everything we wanted the computer to do!

System Software

Examples of System Software:

- Utility software
- System servers
- Device drivers
- Operating system (OS)
- Windows/graphical user interface (GUI) systems
- Microsoft Windows
- Linux
- Unix
- Mac OSX
- DOS
- BIOS Software
- HD Sector Boot Software
- Device Driver Software i.e Graphics Driver
- Linker Software
- Assembler and Compiler Software

System Software

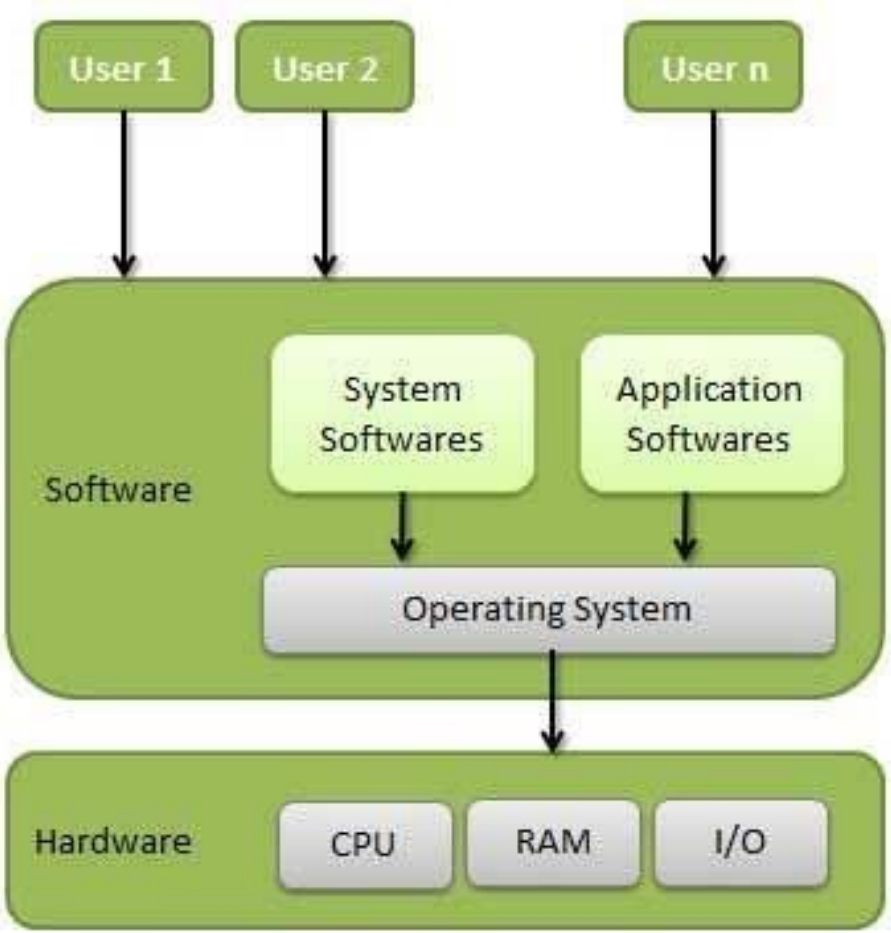
Features of System Software

- Close to system
- Fast in speed
- Difficult to design
- Difficult to understand
- Less interactive
- Smaller in size
- Difficult to manipulate
- Generally written in low level language

Operating Systems

- Operating System is a software, which makes a computer to actually work.
- Collection of computer programs that control the interaction of the user and the computer hardware.
- Responsible for directing all computer operations and managing all computer resources.
- Controls basic input and output, allocates system resources, manages storage space, maintains security, and detects equipment failure.
- A part of the operating system code is stored in a ROM and the rest of it resides on a disk.

Operating Systems



Operating Systems

- Examples: Windows, Linux, Unix and Mac OS, etc.,

Operating Systems

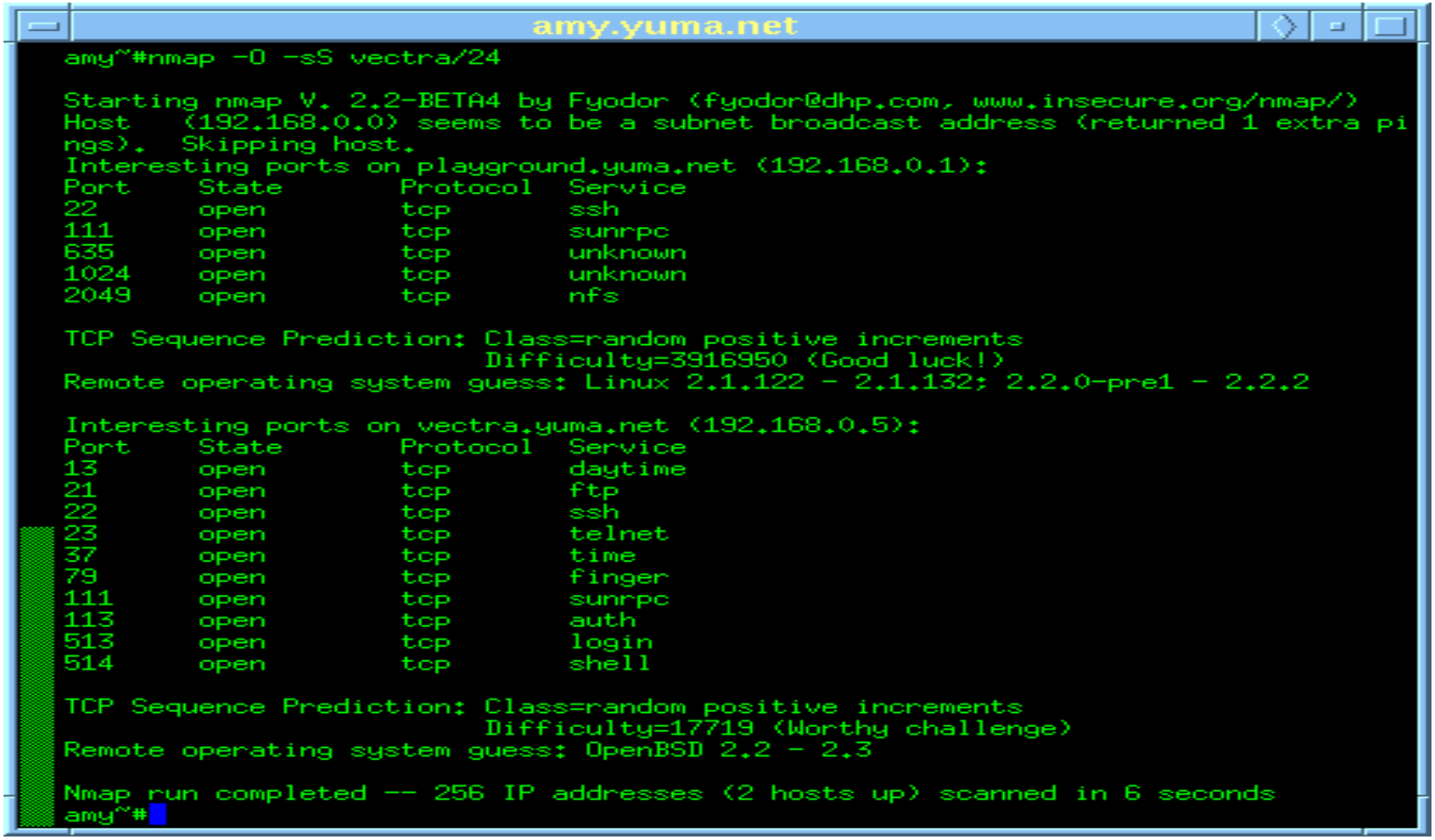
Microsoft Windows XP

Operating Systems

Apple Mac OS X

Operating Systems

Linux command-mode

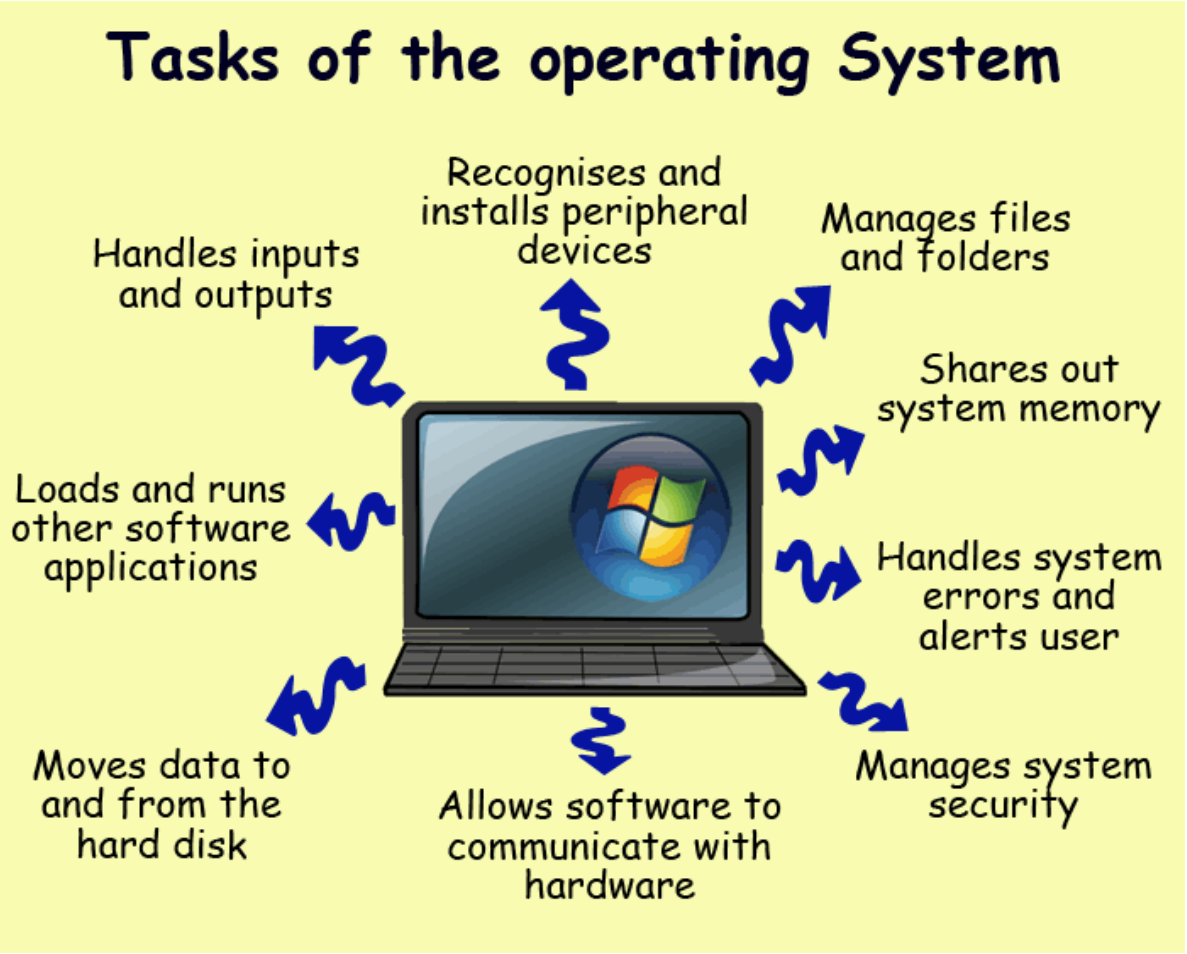


Operating Systems

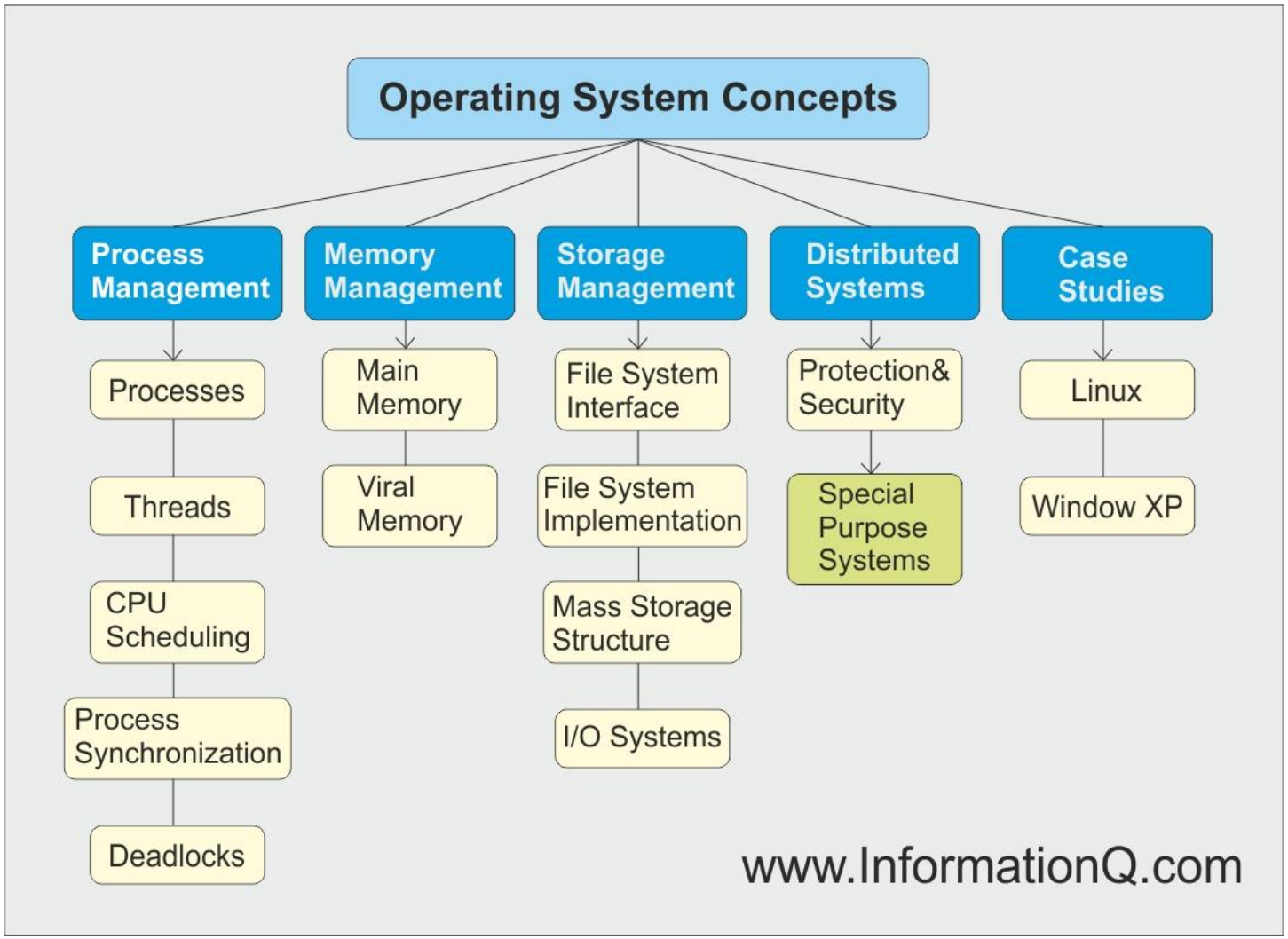
Responsibilities of an Operating System

- Communicate with user, receive and execute commands, show error messages.
- Manage allocation of memory, processor time and other resources.
- Collect input from keyboard, mouse, and provide data to running programs.
- Convey program output to screen, printer, or other output device.
- Access data from secondary storage.
- Write data to secondary storage.
- Maintains security (checks user-name , password, virus infection)

Operating Systems



Operating Systems

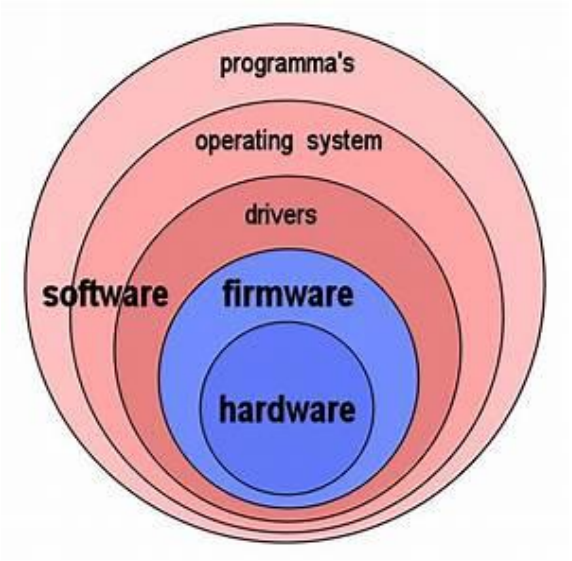


Gadget Drivers

- This kind of software controls specific hardware which is basically connected to system.
- A driver provides a software interface to hardware devices, enabling operating systems and other computer programs to access hardware functions without needing to know precise details about the hardware being used.
- Profiles Driver
- Motherboard Drivers
- Show Drivers
- ROM Drivers
- Printer Drivers
- USB Drivers
- Sound Card Driver
- VGA Drivers

Firmware

- Firmware is a software program permanently etched into a hardware device such as a keyboards, hard drive, BIOS, or video cards. It is programmed to give permanent instructions to communicate with other devices and perform functions like basic input/output tasks.
- The firmware is a special type of software that helps to a control device's hardware.
- Inserted Systems
- UEFI (Unified Extensible Firmware Interface)
- Profiles
- PC Peripherals



Utility

- Utility software is software designed to help to analyze, configure, optimize or maintain a computer.
- It is used to support the computer infrastructure - in contrast to application software, which is aimed at directly performing tasks that benefit ordinary users.
- McAfee Antivirus
- WinRAR
- WinZip
- Piriform CCleaner
- Windows File Explorer
- Registry Opus
- Razer Cortex
- Norton Antivirus

Application Software

- Application software, or simply applications, are often called productivity programs or end-user programs because they enable the user to complete tasks.
- Application software is specific to the task it is designed for and can be as simple as a calculator application or as complex as a word processing application.
- Software that can perform a specific task for the user, such as word processing, accounting, budgeting or payroll, fall under the category of application software.

Application Software

Example of Application Software:

- **Word processing software:** The main purpose of this software is to produce documents.
- MS Word
- Apple iWork-Pages
- Corel WordPerfect
- Google Docs
- **Presentation software:** This software is used to display the information in the form of slide show. The three main functions of presentation software is
  - Allows insertion and formatting of text,
  - Including graphics in the text and
  - Executing the slide shows.

  The best example for this type of application software is Microsoft PowerPoint.

Application Software

- **Multimedia software:** Media players and real players are the examples of multimedia software. This software will allow the user to create audio and videos.
- **Sight and sound Software :**
  This is software which can play, make just as record pictures, sound or even video documents. These software are used for liveliness, video altering, illustrations just as picture altering. Because of popularity for such software, each software item improvement organization has huge roads in creating them. A portion of instances of such software are :
  - Adobe Photoshop
  - Picasa
  - VLC Media Player
  - Windows Media Player
  - Windows Movie Maker

Application Software

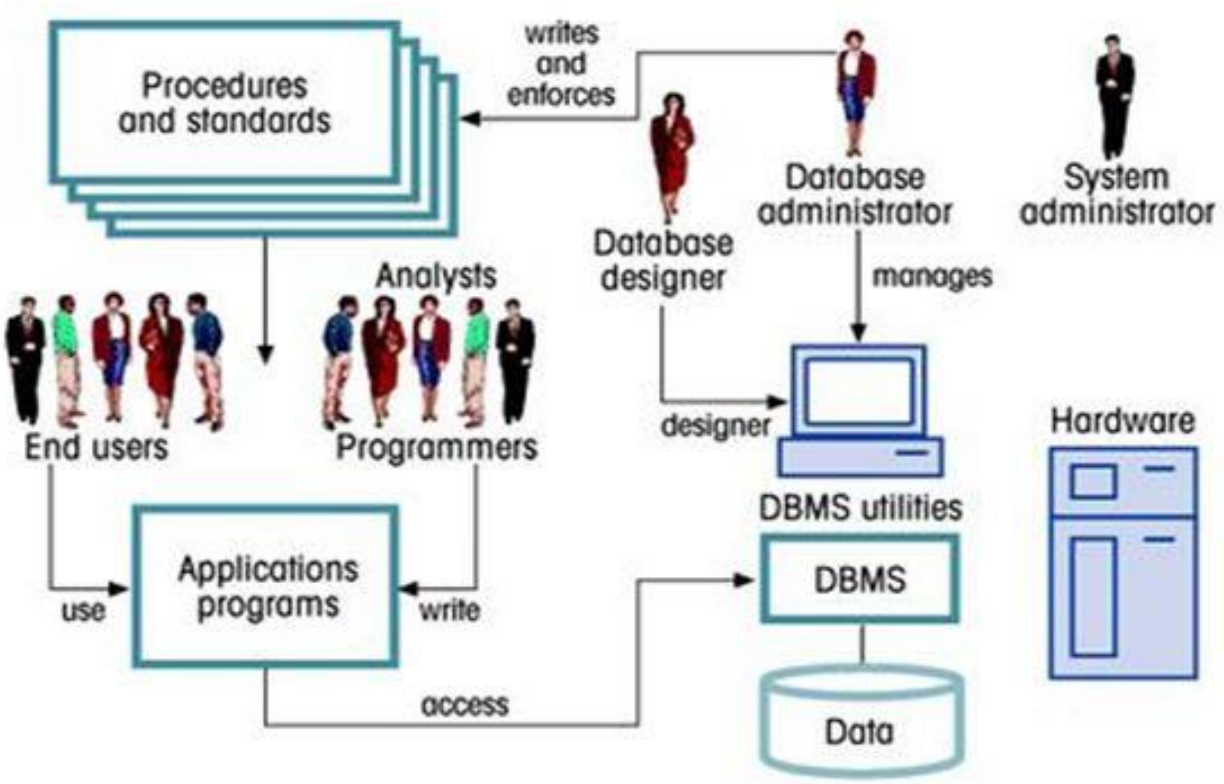
- **Spread sheet software:** The spread sheet software is used to maintain budget, financial statements, grade sheets, and sales records.
- **Internet Browsers :**
  These software are used to peruse web. Internet browsers help clients in situating just as recovering information well over web.
  - Google Chrome
  - Mozilla Firefox
  - Web Explorer
  - Drama
  - UC Browser
  - Safari

Application Software

Database Management System (DBMS):

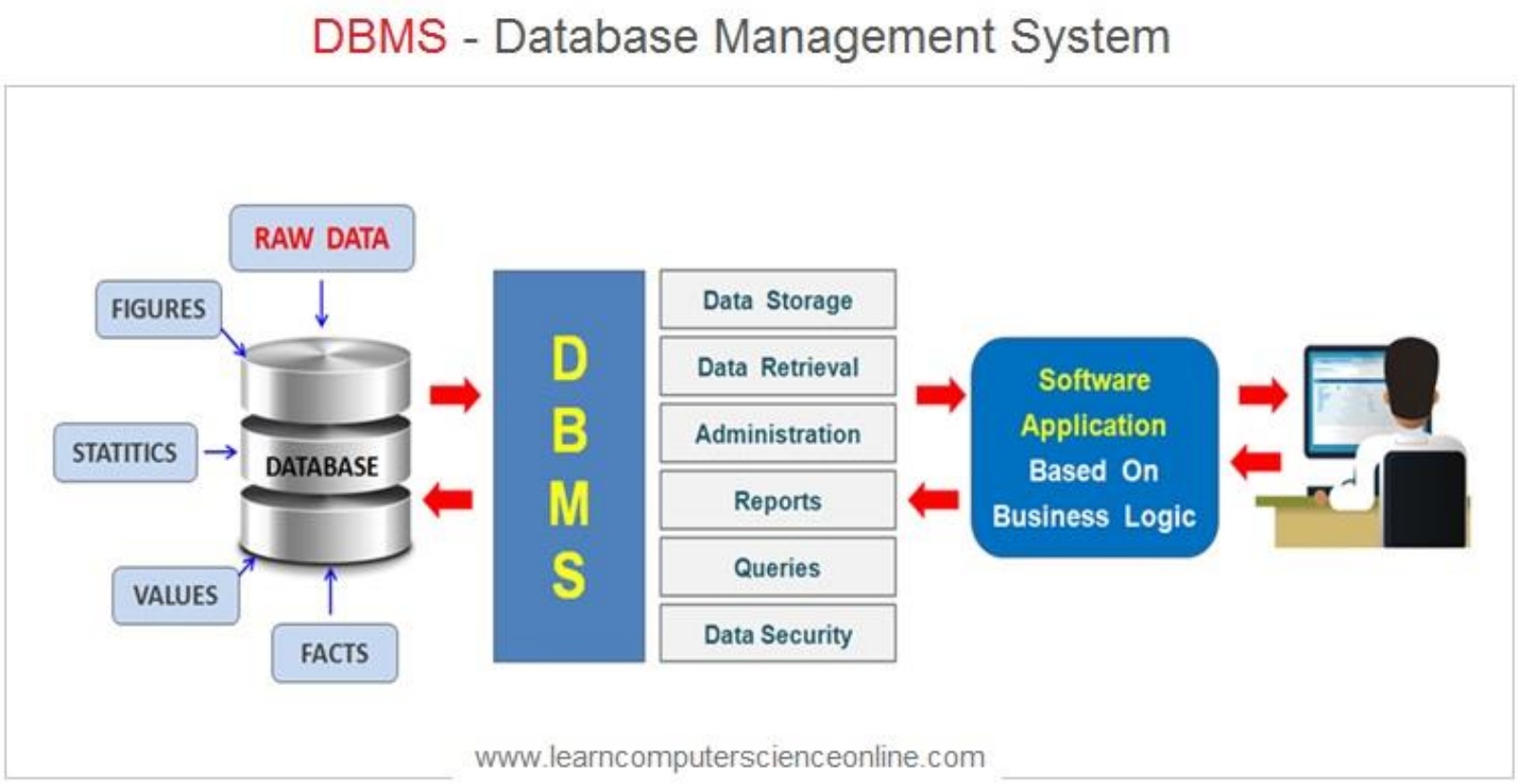
- A DBMS is a software tool that allows multiple users to store, access, and process data into useful information.
  - The purpose of this software is to organize and manage data.
  - The advantage of this software is that you can change the way data is stored and displayed.
- Database programs are designed for these types of applications:
  - Membership lists
  - Student lists
  - Grade reports
  - Instructor schedules
- All of these have to be maintained so you can find what you need quickly and accurately.
- Example:
  - MS Access
  - FileMaker
  - dBase
  - Scissors
  - MySQL
  - FoxPro

Database Systems



The Database System Environment

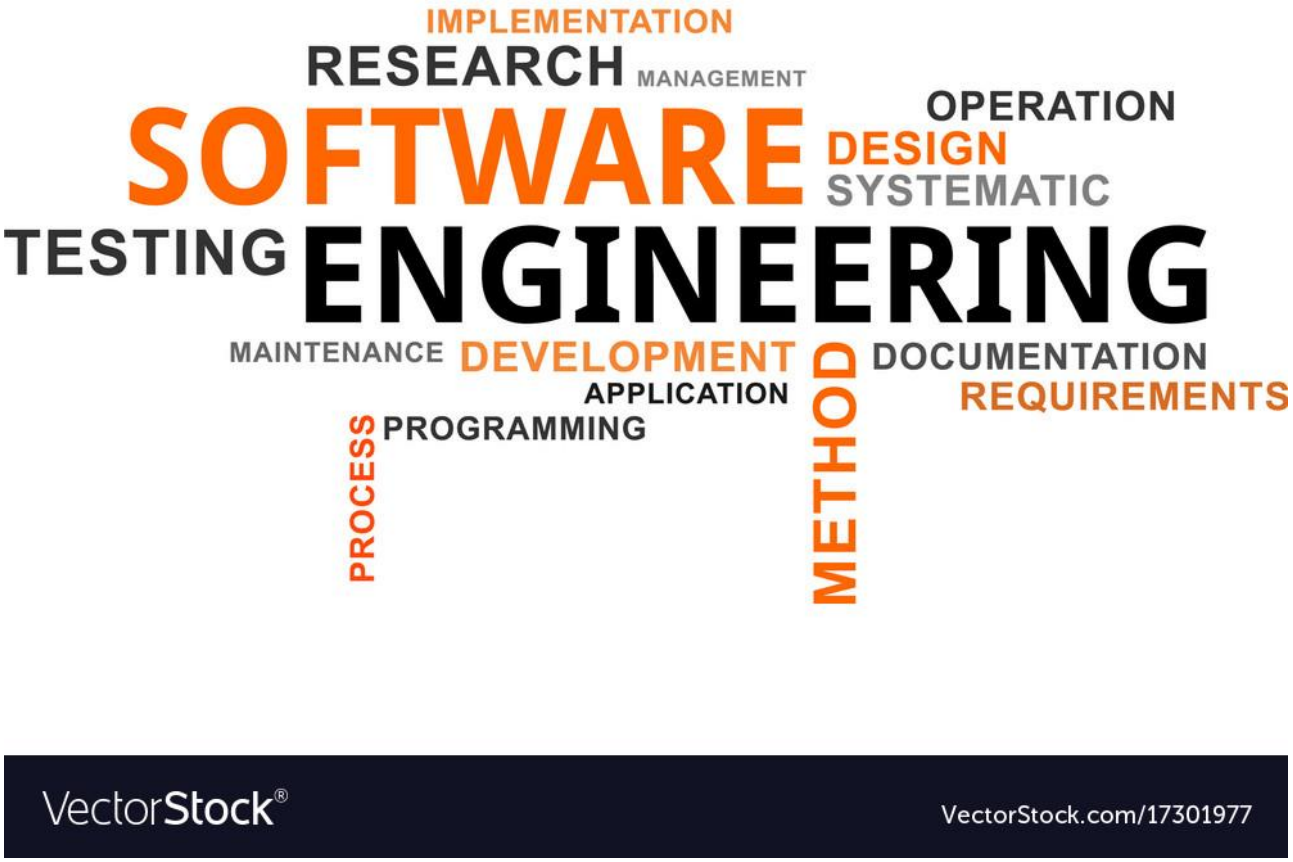
Database Systems



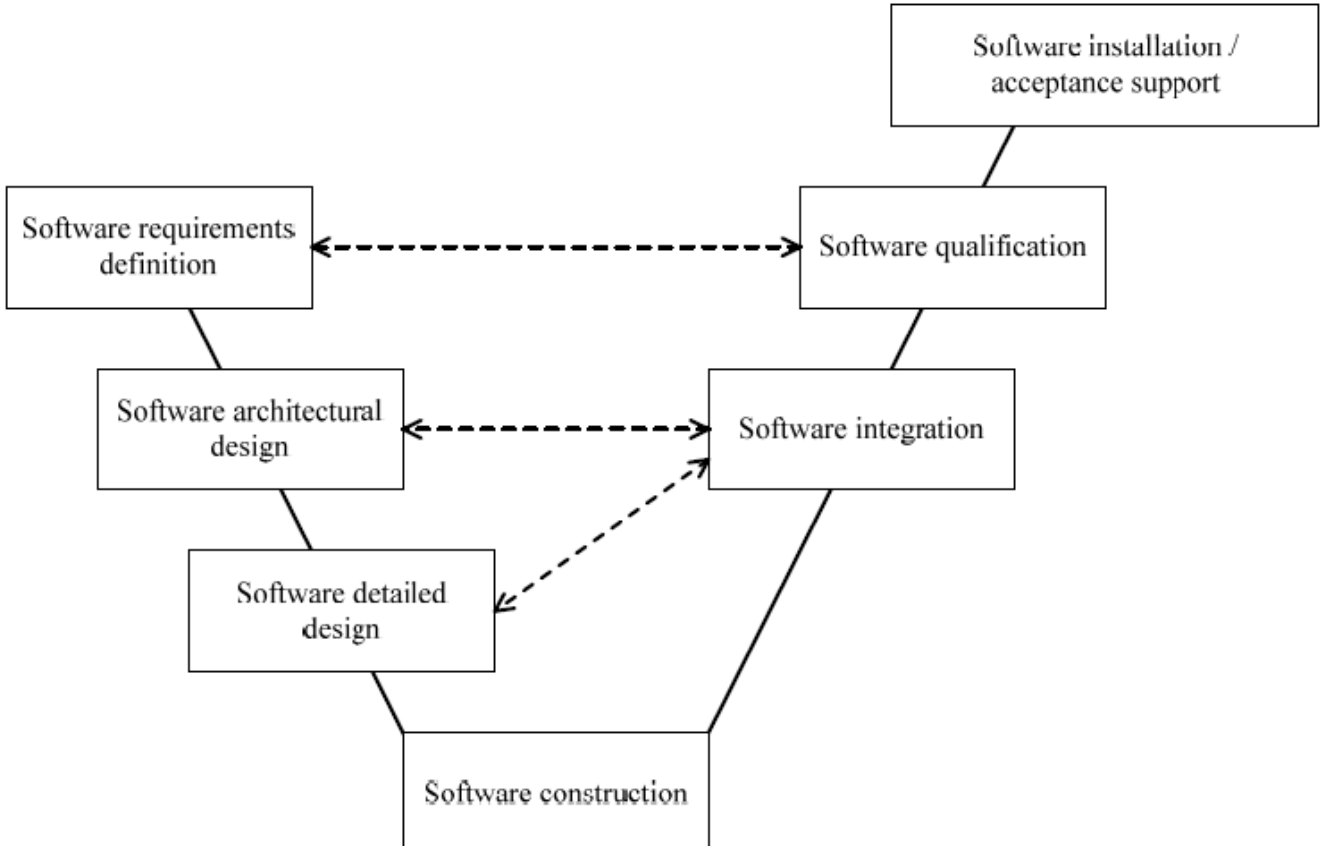
Software Engineering

- Software engineering is a detailed study of engineering to the design, development and maintenance of software. Software engineering was introduced to address the issues of low-quality software projects.
- Problems arise when a software generally exceeds timelines, budgets, and reduced levels of quality. It ensures that the application is built consistently, correctly, on time and on budget and within requirements.

Software Engineering



Software Implementation Process



Software Engineering

- Software Development Lifecycle or SDLC is a series of stages in software engineering to develop proposed software application, such as:

  1) Communication
  2) Requirement Gathering
  3) Feasibility Study
  4) System Analysis
  5) Software Design
  6) Coding
  7) Testing
  8) Integration
  9) Implementation
  10) Operations and maintenance
  11) Disposition

Information Systems Analysis and Design

- Systems Analysis and Design (SAD) is a broad term for describing methodologies for developing high quality Information System which combines Information Technology, people and Data to support business requirement.

Systems Analysis

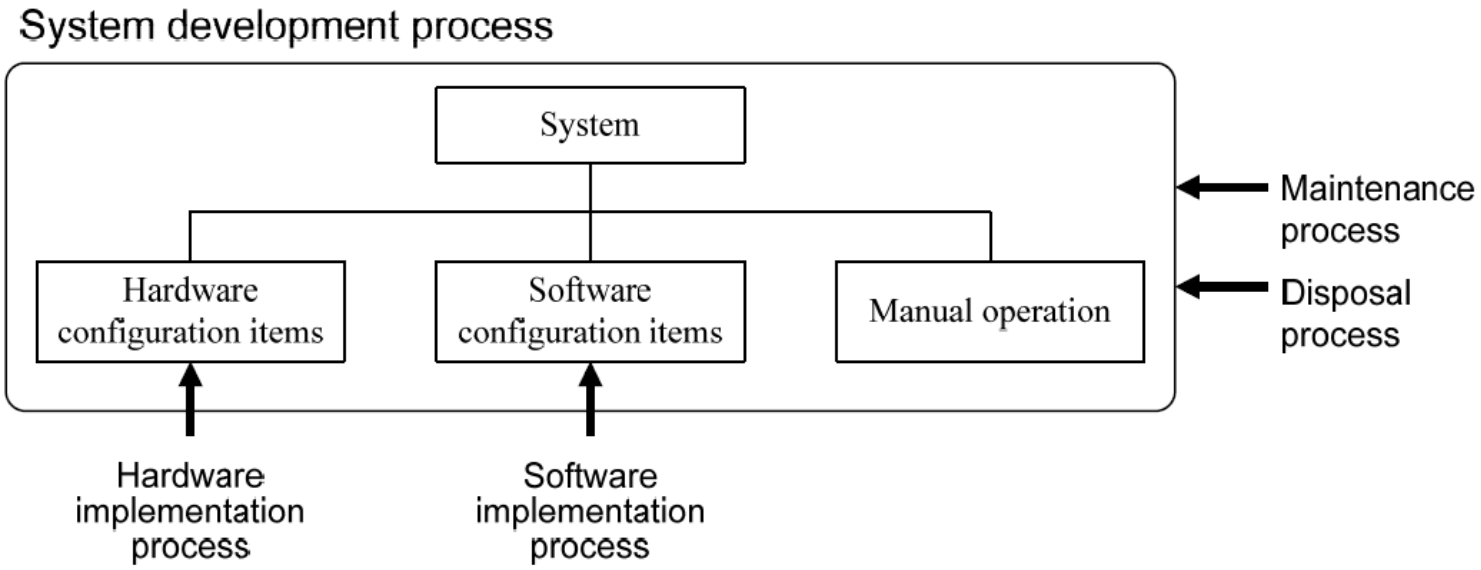
- It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components.

Systems Design

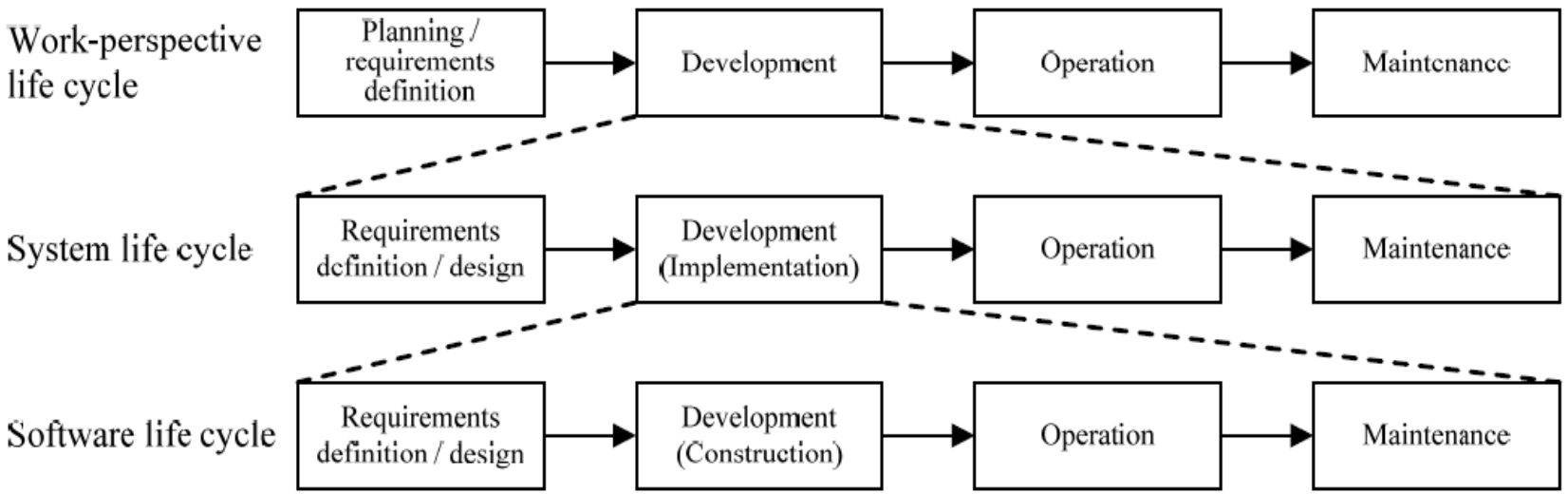
- It is a process of planning a new business system or replacing an existing system by defining its components or modules to satisfy the specific requirements. Before planning, you need to understand the old system thoroughly and determine how computers can best be used in order to operate efficiently.

System Development Technology

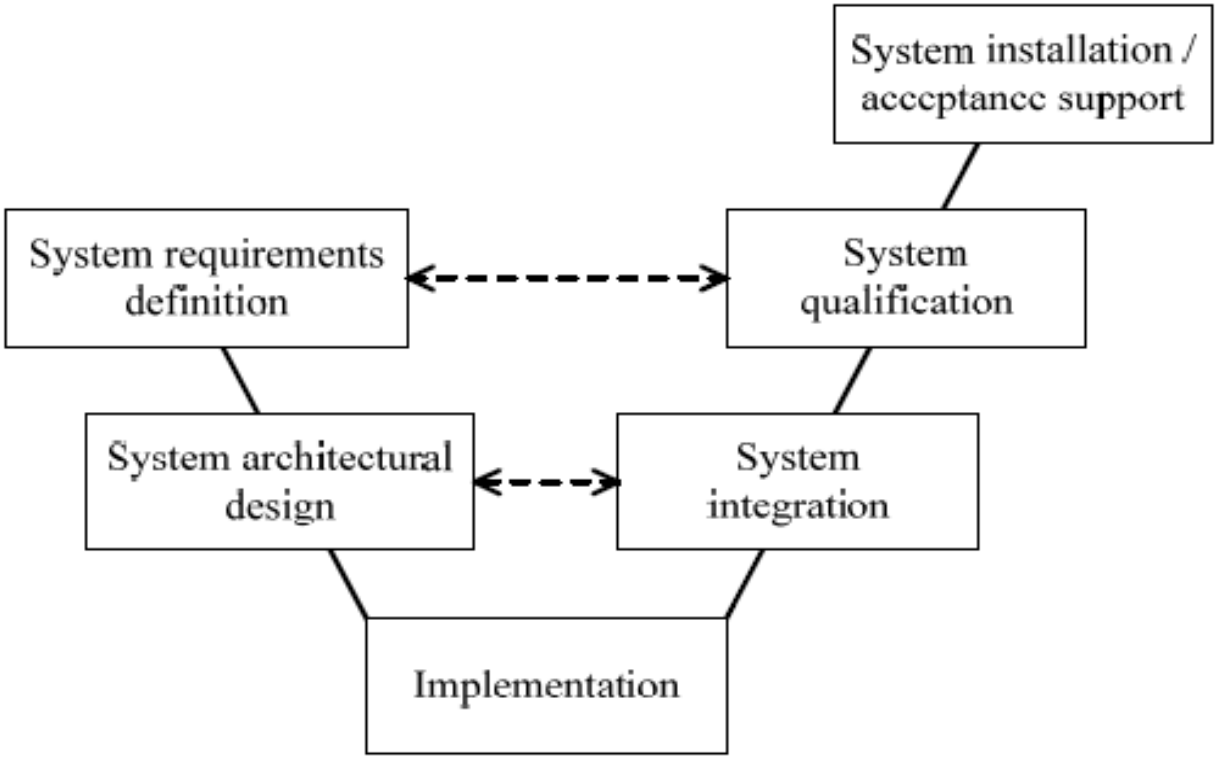
- **Definition**:
  - To develop the individual information systems clarified in information system planning.
  - **Systems development** is the process of defining, designing, testing, and implementing a new software application or program.



System Development Technology



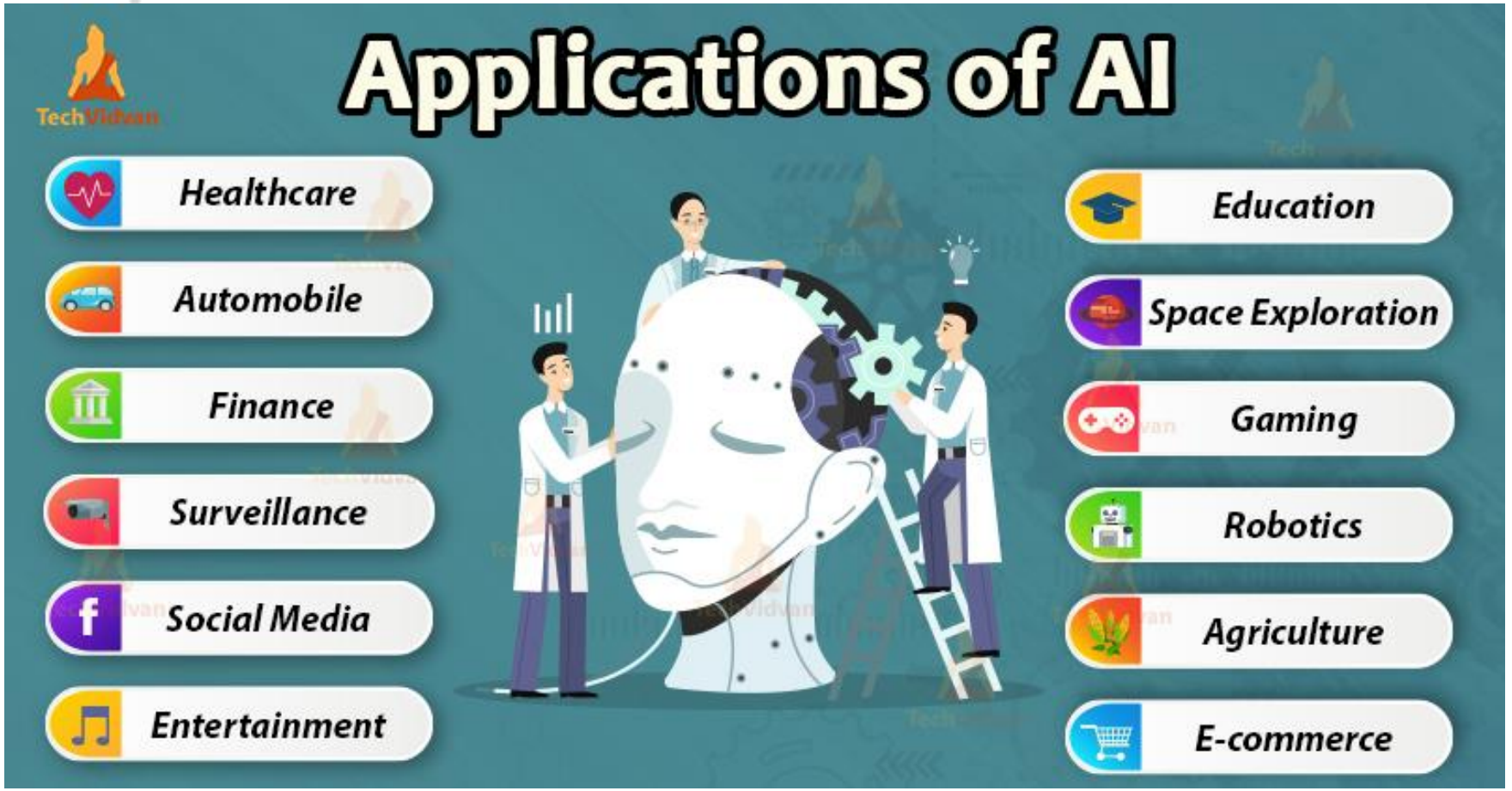
System Development Process



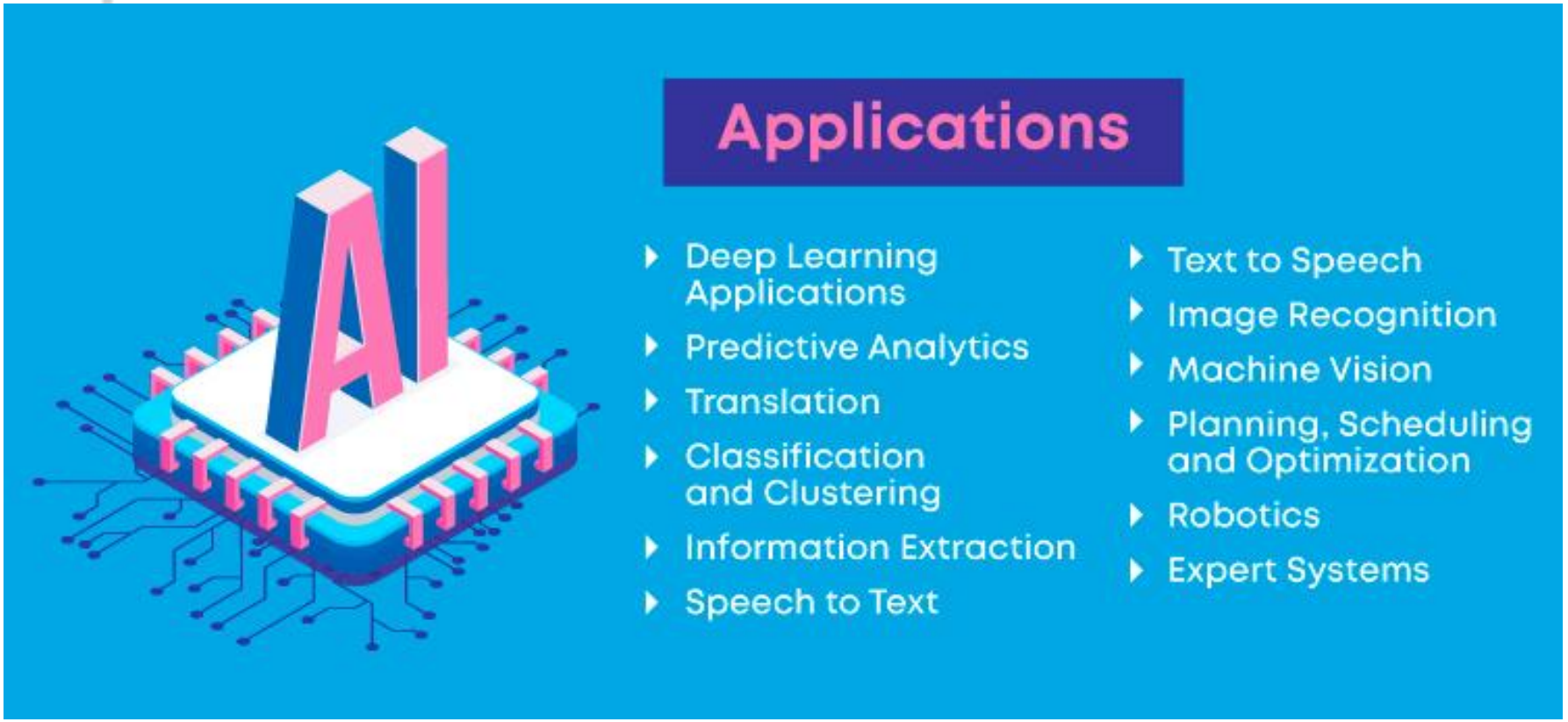
Artificial Intelligence

- Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions.
- The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.
- The ideal characteristic of artificial intelligence is its ability to rationalize and take actions that have the best chance of achieving a specific goal.

Artificial Intelligence



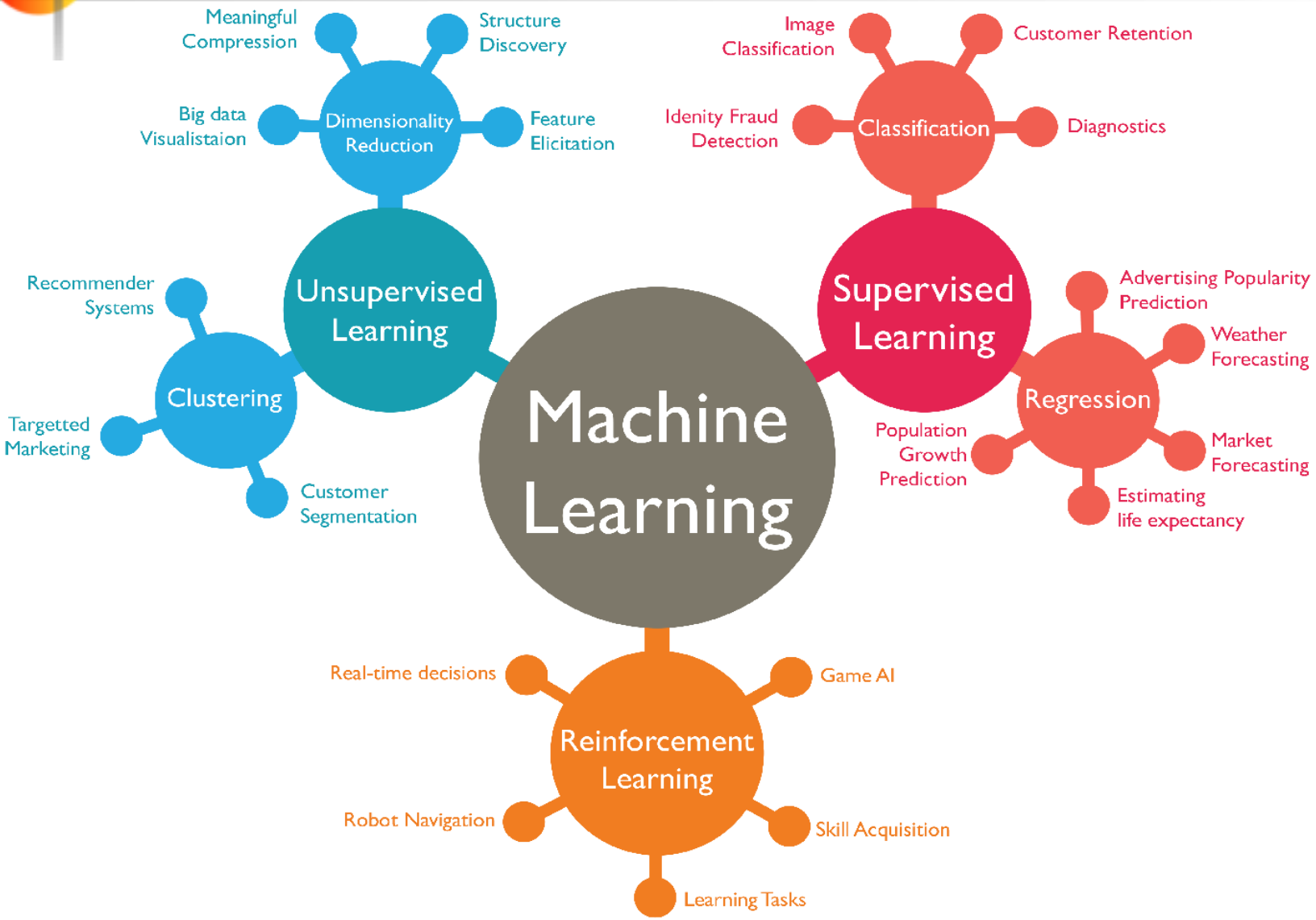
Artificial Intelligence



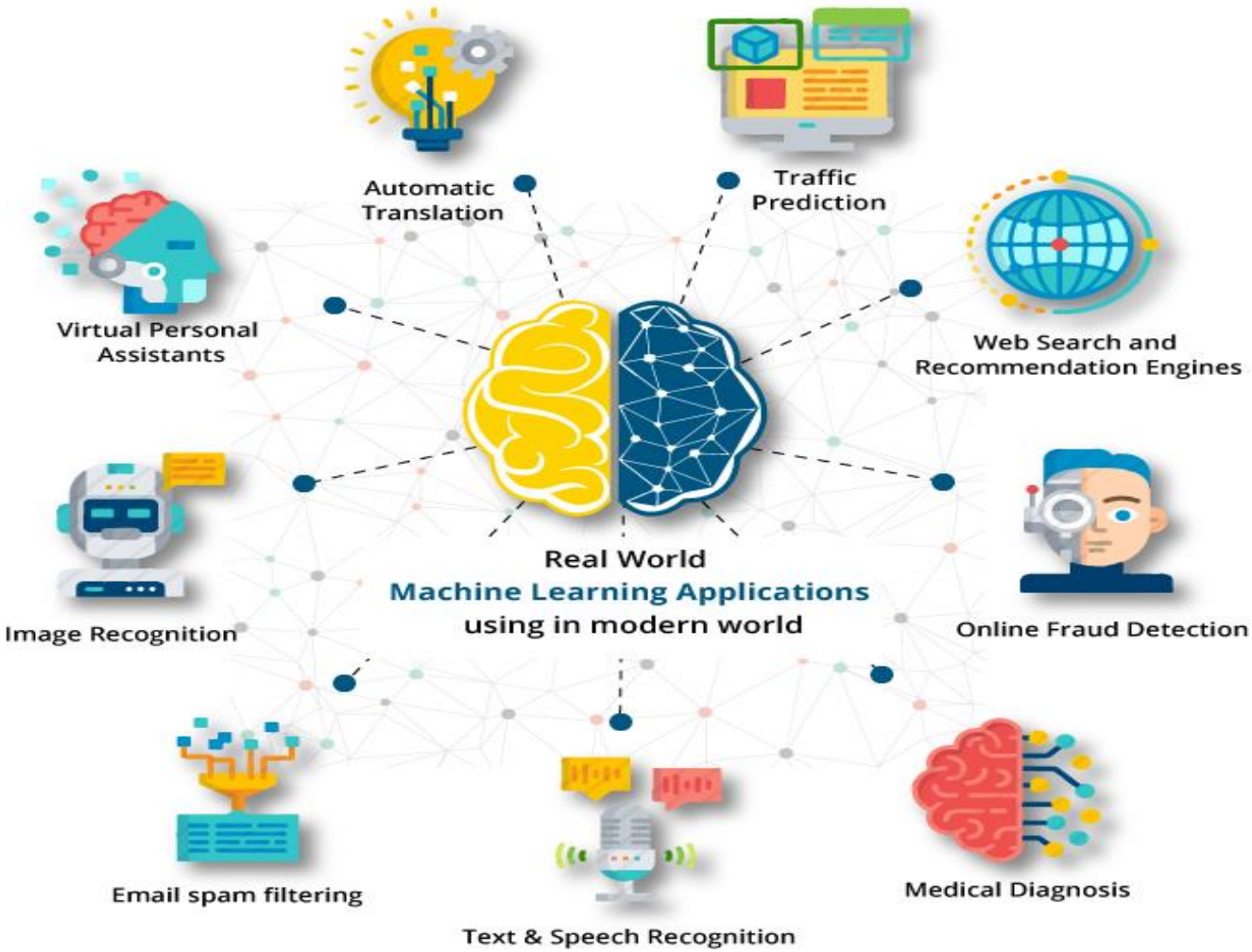
Machine learning

- **Machine learning** is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. **Machine learning focuses on the development of computer programs** that can access data and use it learn for themselves.
- **The primary aim is to allow the computers learn automatically** without human intervention or assistance and adjust actions accordingly.

Machine learning



Machine learning



Thank You