

PORTFOLIO 4

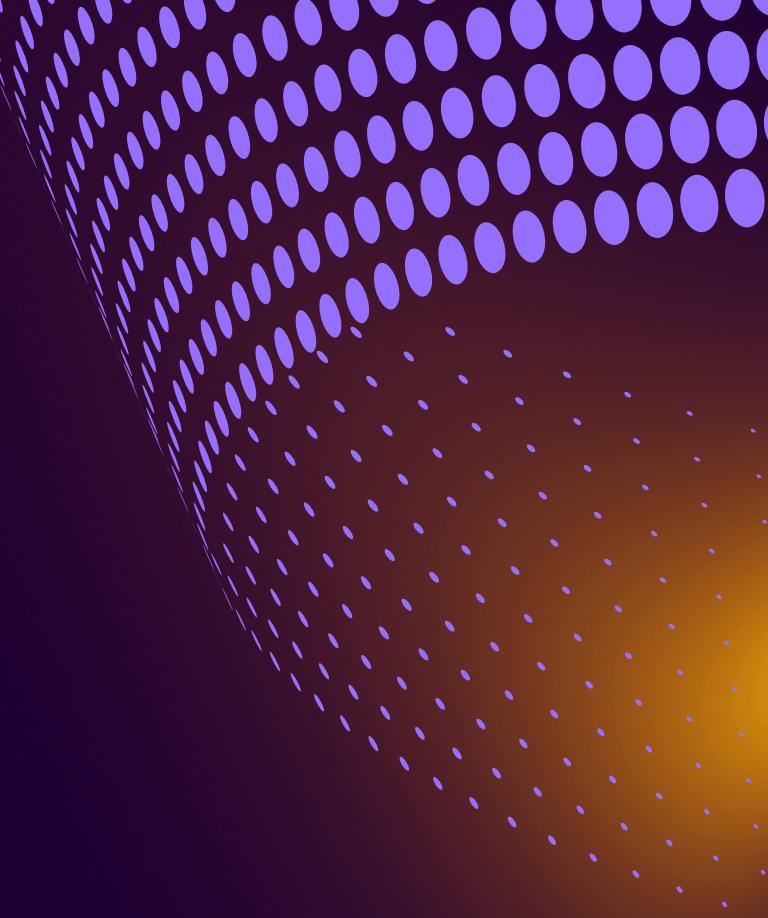
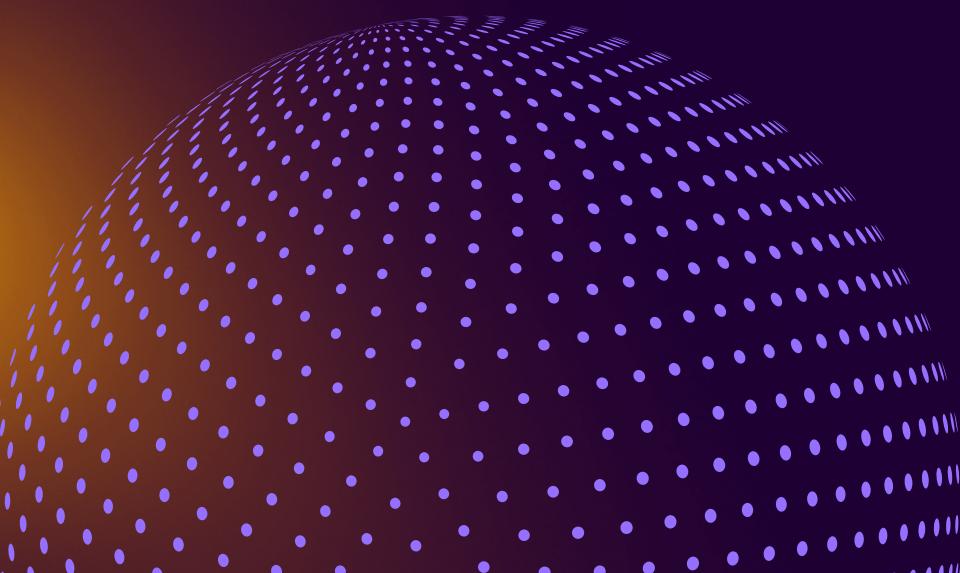
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TOPICS:

01 Computer Hardware

02 Computer Software

03 Their implementation in
the different institutions
in the community



COMPUTER HARDWARE

refers to the **external** and **internal** devices and equipment that enable you to perform major functions such as input, output, storage, communication, processing, and more.

INTERNAL

INTERNAL COMPONENTS COLLECTIVELY PROCESS OR STORE THE INSTRUCTIONS DELIVERED BY THE PROGRAM OR OPERATING SYSTEM (OS).

EXTERNAL

EXTERNAL HARDWARE PERIPHERALS ARE DEVICES THAT CONNECT TO A COMPUTER SYSTEM BUT ARE NOT ESSENTIAL FOR BASIC OPERATIONS. THESE DEVICES ENHANCE THE USER EXPERIENCE AND ENABLE VARIOUS FORMS OF INTERACTION WITH THE COMPUTER.

INTERNAL HARDWARE

Internal components collectively process or store the instructions delivered by the program or operating system (OS).

MOTHERBOARD

This is a printed circuit board that holds the central processing unit ([CPU](#)) and other essential internal hardware and functions as the central hub that all other hardware components run through.

CPU

The CPU is the brain of the computer that processes and executes digital instructions from various programs; its [clock speed](#) determines the computer's performance and efficiency in processing data.

RAM

RAM -- or dynamic RAM -- is temporary [memory](#) storage that makes information immediately accessible to programs; RAM is volatile memory, so stored data is cleared when the computer powers off.

INTERNAL HARDWARE

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HARD DRIVE

A hard drive is a physical storage device that keeps permanent and temporary data, like programs, the operating system, and files such as photos and documents.

SSD

A Solid State Drive (SSD) is a storage device that uses flash memory to store data. Unlike hard drives, SSDs have no moving parts and are faster. They are non-volatile, meaning they keep data safe even when the computer is turned off.

OPTICAL DRIVE

An optical drive is found in a computer's drive bay and allows the computer to read CDs, DVDs, and similar discs. These drives use laser technology to read or write data to the discs.

INTERNAL HARDWARE

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HEAT SINK

A heat sink is a piece of hardware that helps cool down computer components by drawing heat away from them. It is often placed on top of the CPU, which generates a lot of heat during operation.

GPU

The Graphics Processing Unit (GPU) is a chip that handles processing for images and video. It works alongside the CPU to make visual tasks smoother and more efficient.

NIC

A Network Interface Card (NIC) is a chip or circuit board that allows a computer to connect to a network, such as the internet or a local network. It's also called a network adapter and often connects through an Ethernet cable.

EXTERNAL HARDWARE

Internal components collectively process or store the instructions delivered by the program or operating system (OS).

MOUSE

The mouse is a pointing device that allows users to navigate and interact with the computer interface.

KEYBOARD

Keyboards are used for typing and inputting commands into the computer.

MONITOR

Monitors display visual output from the computer, enabling users to see and interact with their applications and data.

EXTERNAL HARDWARE

Internal components collectively process or store the instructions delivered by the program or operating system (OS).

WEBCAM

Webcams capture video and images, essential for video calls and creating multimedia content.

MICROPHONES

Microphones allow users to input audio, useful for communication, recording, and voice commands.

SCANNERS

Scanners convert physical documents into digital format for easy storage and editing.

INTERNAL HARDWARE

Internal components collectively process or store the instructions delivered by the program or operating system (OS).

PRINTER

Printers produce hard copies of digital documents, photos, and other files.

SPEAKERS

Speakers output sound, enhancing multimedia experiences such as music, movies, and video conferencing.

EXTERNAL STORAGE DEVICES

External hard drives and USB flash drives provide additional storage space and make it easy to transfer files between devices.

HARDWARE AND SOFTWARE

are essential parts of any computer system, and knowing how they differ and work together helps us understand how computers operate.

HARDWARE

- The physical parts of a computer system.
- Tangible components that store data and execute instructions provided by the software.
- Acts as the machine that carries out tasks directed by the software.

SOFTWARE

- The non-physical parts of an electronic device, such as programs, apps, and operating systems.
- Provides instructions to hardware, enabling the device to perform specific tasks.
- Includes everything from operating systems (e.g., Windows, macOS) to applications like Microsoft Office and web browsers.
- On devices like laptops and phones, virtual keyboards are considered software as they are part of the device's interface, not physical keys.

COMPUTER SOFTWARE

The two main categories of software are **application** software and **system** software.

Software is a set of instructions, data or programs used to operate computers and execute specific tasks.

It is the opposite of hardware, which describes the physical aspects of a computer.

Software is a generic term used to refer to applications, scripts and programs that run on a device. It can be thought of as the variable part of a computer, while hardware is the invariable part.

APPLICATION

- DESIGNED TO HELP USERS PERFORM SPECIFIC TASKS OR ACTIVITIES.
- USED FOR PERSONAL OR PRODUCTIVITY PURPOSES, LIKE CREATING DOCUMENTS, BROWSING THE INTERNET, OR MANAGING DATA.
- WORD PROCESSORS (E.G., MICROSOFT WORD), WEB BROWSERS (E.G., GOOGLE CHROME), MEDIA PLAYERS, GAMES, AND BUSINESS SOFTWARE.

SYSTEM

- MANAGES AND CONTROLS THE HARDWARE AND PROVIDES A PLATFORM FOR RUNNING APPLICATION SOFTWARE.
- USED TO MAINTAIN AND MANAGE THE CORE OPERATIONS OF A COMPUTER SYSTEM, SUCH AS MANAGING MEMORY, HARDWARE, AND PROCESSES.
- OPERATING SYSTEMS (E.G., WINDOWS, MACOS, LINUX), DEVICE DRIVERS, UTILITY PROGRAMS, AND FIRMWARE.

COMPUTER SOFTWARE

Other types of software include the following:

- Programming software
- Middleware
- Driver software

PROGRAMMING SOFTWARE

- PROGRAMMING SOFTWARE IS A SUB-CATEGORY OF SYSTEM SOFTWARE
- A TYPE OF SOFTWARE THAT ASSISTS PROGRAMMERS IN DEVELOPING, DEBUGGING, AND MAINTAINING OTHER SOFTWARE AND APPLICATIONS.
- COMBINES COMPILERS, DEBUGGERS, AND OTHER TOOLS IN A UNIFIED USER INTERFACE (E.G., VISUAL STUDIO, ECLIPSE).

MIDDLEWARE

- SOFTWARE THAT ALLOWS DIFFERENT APPLICATIONS TO COMMUNICATE AND WORK TOGETHER.
- USED TO CONNECT NEW PROGRAMS TO OLDER SYSTEMS WITHOUT REWRITING THE ORIGINAL CODE.
- EX: A WINDOWS-BASED APPLICATION COMMUNICATING WITH A LINUX SERVER WITHOUT USERS NOTICING THE DIFFERENCE.

DRIVER SOFTWARE

- DRIVER SOFTWARE IS A TYPE OF SYSTEM SOFTWARE THAT ACTS AS AN INTERMEDIARY BETWEEN THE COMPUTER'S OPERATING SYSTEM AND HARDWARE DEVICES.
- TRANSLATES GENERAL OPERATING SYSTEM COMMANDS INTO DEVICE-SPECIFIC INSTRUCTIONS, ENABLING THE OPERATING SYSTEM TO COMMUNICATE WITH HARDWARE PERIPHERALS.
- ALLOW THE COMPUTER TO SEND PRINT COMMANDS TO A CONNECTED PRINTER.

EDUCATIONAL USES OF COMPUTERS IN TERMS OF HARDWARE AND SOFTWARE

HARDWARE

- Computers (Desktops and Laptops) are the most basic hardware for accessing educational materials, conducting research, writing assignments, and using educational software.
- Projectors and Interactive Whiteboards are used in classrooms to display lessons, presentations, and interactive content, fostering collaboration and visual learning.
- Printers and Scanners: Enable students to print assignments or scan documents, making it easier to submit work or review materials.

SOFTWARE

- Word Processors (Microsoft Word, Google Docs): Help students create written assignments, reports, and essays with features like spell check, formatting, and citation management.
- Presentation Software (Microsoft PowerPoint, Google Slides): Students and educators use these to create visually engaging presentations, enhancing the delivery of lessons or projects.
- Research Tools (Google Scholar, Microsoft Academic): Assist students in gathering research materials and references for assignments or projects.

COMPUTER HARDWARE AND SOFTWARE IN HEALTHCARE FACILITIES

HARDWARE

- Computers are embedded in devices such as MRI machines, CT scanners, and X-ray machines, which help in diagnosing and monitoring patients' health.
- Workstations and Servers: These are used by healthcare providers for accessing and storing electronic health records (EHRs) and other patient data.
- Wearable Devices: Devices like fitness trackers, smartwatches, and medical wearables (e.g., continuous glucose monitors) help monitor patients' vital signs in real time.
- Robotics: Surgical robots, powered by computers, assist doctors in performing precise surgeries with minimal invasiveness, leading to quicker recovery times.

SOFTWARE

- Electronic Health Records (EHRs): Software systems like Epic, Cerner, and Allscripts store patient data, such as medical history, diagnoses, prescriptions, and treatment plans, allowing healthcare providers to access and update information easily.
- Telemedicine Platforms: These software applications (e.g., Teladoc, Zoom for Healthcare) enable remote consultations, allowing patients to receive care without visiting healthcare facilities.

ANALYSIS

The term "computer hardware" refers to the actual hardware—both internal and external that comprises a computer system. To store, process, and execute data, internal components such as a motherboard, CPU (central processing unit), RAM (random access memory), hard disk drives, and solid-state drives collaborate. These parts are powered by the motherboard, which acts as a hub, and the CPU, which is the computer's brain and receives commands to perform computations and analyze data. A keyboard, monitor, printer, scanner, and other external hardware elements give users a way to communicate with the system and expand a computer's capabilities.

In some way, the software means the opposite of hardware, as it refers to the intangible part of the computer: specific instructions or code for the hardware for carrying out several functions. System software consists of operating systems, device drivers and any other kind of software that has core tasks of a computer and allows different hardware and applications to communicate and work properly in a coordinated manner. Application software consists of programs that allow users to perform specific tasks like, word processing, web browsing and presentation making, for example, Ms Word, Google Chrome, and PowerPoint respectively.

ANALYSIS

Combining hardware and software improves learning in education by making it more adaptable, interesting, and accessible.

Teachers can use computers and projectors to display the material with diagrams and graphics, which helps pupils grasp the more complex concepts. Students can create and manage assignments and presentations more efficiently by using programs like Google Slides and Microsoft Word. These technologies enable collective effort and facilitate learning for the pupils regardless of their location, which makes it easy to meet different learning requirements.

In healthcare, hardware and software systems work together to contribute to the delivery of patient care accurately and efficiently. Many medical diagnostic tools such as the MRI and CT scanners use powerful hardware to create diagnostic images and patient information is organized and stored in software systems that utilize electronic health records (EHR). Now with telemedicine patients can see a doctor without being in the same location, which increases the number of people who have access to health services. All this technology promotes time efficiency, improves accuracy of diagnosis, and consolidates patient data to support efficient decision-making by the healthcare providers.

The combination of hardware and software leads to positive changes in terms of productivity, efficiency and availability of services across several industries. Nevertheless, as technology shifts more into the focus, it is important to address the issue of data privacy and security in order to secure sensitive data, especially in education and health care setting.

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