

## Chapter 3

# The Hardware And Software Puzzle

### Story of Alice and Her Grandfather

Alice and her **grandfather** loved playing with computers.

Alice had learned about the different parts of a computer, like the screen, keyboard, and mouse.

One day, her grandfather explained to her that there were two types of computer parts, called **hardware and software**.

**Hardware** is the parts of the computer that you can **touch**, like the **screen, keyboard, and mouse**.

**Software** is the programs and apps that you **use** on the computer. Everything in a computer is either **“Hardware”** or **“Software”** !



To help Alice understand, her grandfather used the example of a video game. The hardware is like the controller, console, and TV, while the software is like the game itself.

Just like how you need a controller and console to play a video game, you need hardware to run software.

### Hardware vs Software -

Broadly speaking, **Hardware** refers to all the **physical components** of the computer and **Software** refers to all the **programs (or Instructions)** that tell these physical components to do something.

**Hardware = Hard + Ware**

**Hardware** is derived from the words **“Hard”** and **“Ware”**. Hard means the physical and Ware means a product. So, a **physical product of a computer is Hardware**. These physical components **can be seen and touched**.

## Software = Soft + Ware

**Software** is derived from the words “**Soft**” and “**Ware**”. It is called soft because you **cannot touch** them. They are not present in any physical form.

These are a set of **instructions** that tell the hardware to do specific tasks.

### *Alice video game is not working*

Alice loved playing her favourite video game on her computer. She would use the mouse and keyboard to control the game and see the game's images on the screen.

One day, she noticed that her game wasn't working properly.

- The images on the screen were glitchy,
- And her character wasn't moving correctly.
- She tried to play the game again, but it still wasn't working.



Alice was confused and didn't know what to do. She asked her grandfather for help.

Her grandfather told her that the **problem** might be **because** of the **hardware** or **software**.

- ❖ To check if it was a hardware problem, her grandfather inspected the computer and found that the **monitor's cable was not plugged in correctly**. He connected the cable but the game was still not working.
- ❖ Then, her grandfather checked the software. He found out that the **game software is not updated**. He then updated the games software.

After this, Alice started the game, and this time, it worked correctly. She was able to control her character with the mouse and keyboard, and the images on the screen were smooth.

Her grandfather explained to her that

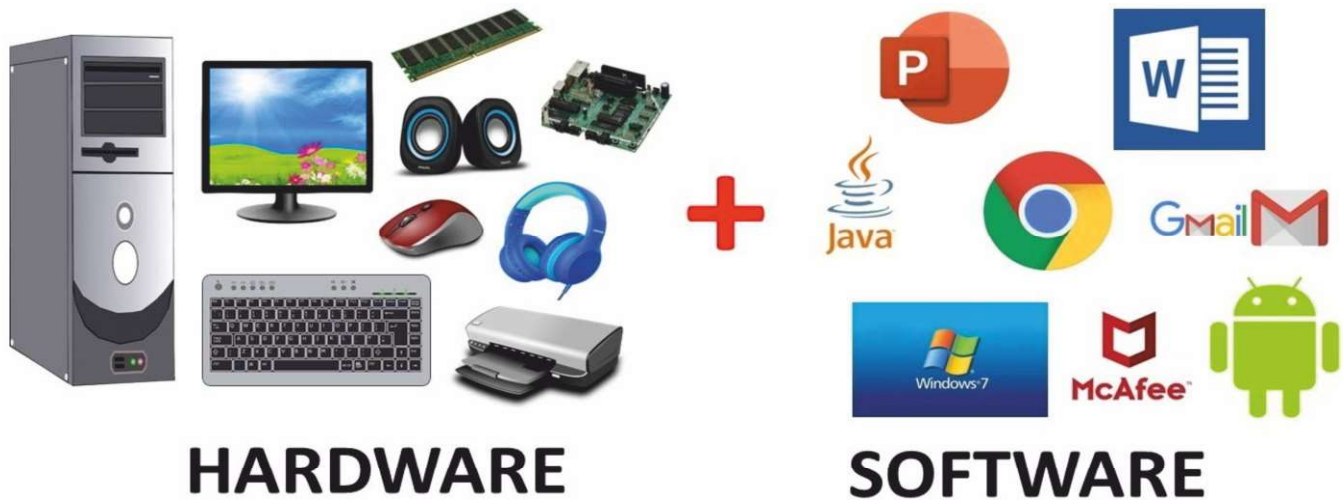
### Hardware and Software are dependent on each other

Just like how a car won't run without petrol, a computer's software won't work without hardware. The hardware is the physical parts of the computer, and the software is the programs and apps that run on the hardware.

Alice learned the importance of keeping both the hardware and software up to date and in good condition to have a smooth experience while using her computer.

### *Let's Compare:*

| Hardware                                                                           | Software                                                                                                       |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| It is abbreviated as <b>HW</b>                                                     | It is abbreviated as <b>SW</b>                                                                                 |
| Physical components of computer system                                             | Set of programs or instructions that enables the hardware to perform specific task                             |
| It is <b>manufactured</b> (Factory-made)                                           | It is <b>developed</b> or <b>engineered</b> (Created by software engineers)                                    |
| It can be seen and touched                                                         | It can be seen and used but cannot be touched                                                                  |
| Hardware cannot perform any task on its own. It needs software to tell what to do. | Software cannot perform any task on its own. It needs hardware where the program will execute a specific task. |
| It is not affected by computer virus                                               | It is affected by computer virus                                                                               |
| <b>Example:</b> Keyboard, Mouse, Monitor                                           | <b>Example:</b> iCodeT, Computer Paint, Computer Calculator                                                    |



## HARDWARE COMPONENTS

We learnt about Hardware and Software in our last topic. We also know the computer with respect to Input, Process and Output actions.

These actions are result of Hardware and Software Communication.

Thus, the hardware components can also be classified into

- Input Devices
- Output Devices
- Process Devices

### Definition

**Input** - *The devices that enable users to send input to the computer are called Input Devices. This input can be a form of data, information or signals.*

**Process** - *The device that is responsible for processing the received input and to produce the desired output is called CPU.*

**Output** - *The devices that enable the computer to send output for the user are called Output Devices.*

In other words, output is a result of processed input available at the output device.

| <i>Input Devices</i> | <i>Output Devices</i> | <i>Process Devices</i> |
|----------------------|-----------------------|------------------------|
| Keyboard             | Monitor               | CPU                    |
| Mouse                | Printer               |                        |
| Touchpad             | Projector             |                        |
| Microphone           |                       |                        |
| Scanner              |                       |                        |
| Webcam               |                       |                        |
|                      |                       |                        |

## ***Let's know them in brief:***



### **Keyboard**

- A keyboard is like a set of magical buttons that helps us talk to the computer.
- When we press the keys on the keyboard, we tell the computer what we want it to do, like typing letters or playing games.



### **Mouse**

- We use mouse to point at things on the screen and click to tell the computer what we want to do, like opening games or drawing pictures.



### **Touchpad**

- A Touchpad is just like a mouse, we use the touchpad to do things on the computer like playing games, scrolling and watching videos.



### **Microphone**

- Picture the microphone as a translator. When we talk, the microphone changes those sounds into a language computer understands.



## Scanner

- A scanner is like a digital copy machine for the computer. It helps us bring pictures or drawings into the computer so we can see and use them.



## Webcam

- A webcam is like a tiny camera that's built into your computer or can be attached to it. It helps you see and talk to friends, family, or even play games with people far away.

## Monitor

- A monitor is like a big TV screen for the computer that shows us everything that is happening.
- We look at the monitor to see our favorite games, movies, or pictures. It's like a window into the computer world.



## Printer

- A printer is like a magical machine that can make paper copies of pictures or documents from the computer.



## Projector

- A projector is like a magic lantern that shows the computer's pictures on a big screen or wall.
- We use a projector when we want to share videos or pictures with a whole group of friends in a bigger way.



## CPU (Central Processing Unit)

- The CPU is like the brain of the computer; it helps the computer think and do all its tasks.
- When we play games or do homework, the CPU is working hard to make sure everything happens the way we want it to.

