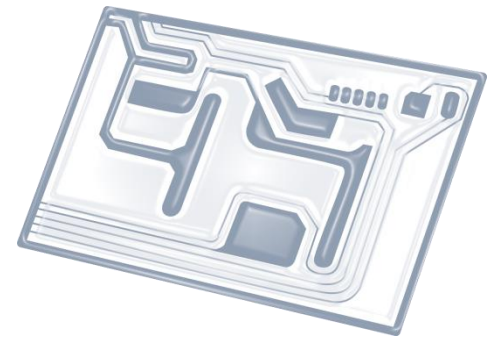# *System Design basics*

IB Computer Science

Content developed by
Dartford Grammar School
Computer Science Department

HL Topics 1-7, D1-4

1: System design

2: Computer Organisation

3: Networks

4: Computational thinking

5: Abstract data structures

6: Resource management

7: Control

D: OOP

HL & SL 1.2 Overview

Components of a computer system

1.2.1 Define the terms: hardware, software, peripheral, network, human resources

1.2.2 Describe the roles that a computer can take in a networked world

1.2.3 Discuss the social and ethical issues associated with a networked world

System design and analysis

1.2.4 Identify the relevant stakeholders when planning a new system

1.2.5 Describe methods of obtaining requirements from stakeholders

1.2.6 Describe appropriate techniques for gathering the information needed to arrive at a workable solution

1.2.7 Construct suitable representations to illustrate system requirements

1.2.8 Describe the purpose of prototypes to demonstrate the proposed system to the client

1.2.9 Discuss the importance of iteration during the design process

1.2.10 Explain the possible consequences of failing to involve the end-user in the design process

1.2.11 Discuss the social and ethical issues associated with the introduction of new IT systems

Human interaction with the system

1.2.12 Define the term usability

1.2.13 Identify a range of usability problems with commonly used digital devices

1.2.14 Identify methods that can be used to improve the accessibility of systems

1.2.15 Identify a range of usability problems that can occur in a system

1.2.16 Discuss the moral, ethical, social, economic and environmental implications of the interaction between humans and machines

1: System design

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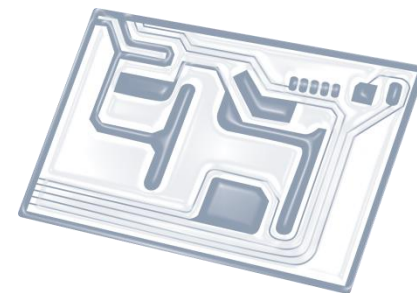
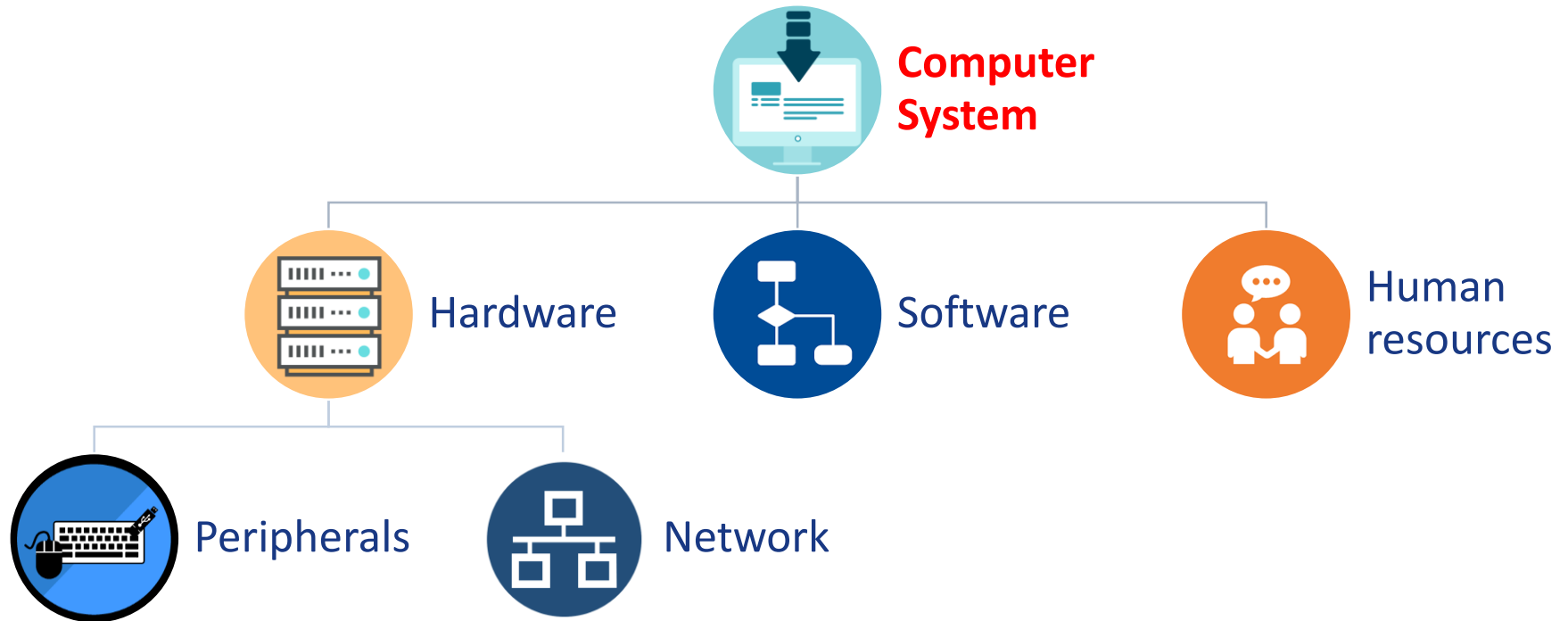6: Resource management

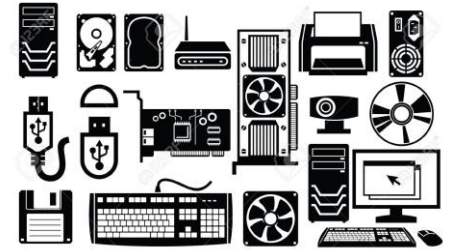7: Control

D: OOP

Topic 1.2.1

Define the terms: **hardware**, **software**, **peripheral**, **network**, **human resources**

5 components of a ' computer system'

Computer System

Hardware

Software

Human resources

Peripherals

Network

Hardware

- Computer hardware refers to the **physical parts** of a computer and related devices.

- **Internal hardware devices** include motherboards, hard drives, and RAM.

- **External hardware devices** include monitors, keyboards, mice, printers, and scanners.

- The internal hardware parts of a computer are often referred to as **components**, while external hardware devices are usually called **peripherals**.

Peripherals

- A computer peripheral is any **external device** that provides input and output for the computer.

- For example, a keyboard and mouse are **input peripherals**, while a monitor and printer are **output peripherals**.

- Computer peripherals, or peripheral devices, are sometimes called **I/O devices** because they provide input and output for the computer.

Network

- A network consists of **multiple devices** that **communicate** with one another using a **transmission medium**.

- It can be as small as two computers or as large as billions of devices.

- While a traditional network is comprised of desktop computers, modern networks may include laptops, tablets, smartphones, televisions, gaming consoles, smart appliances, and other electronics.

- Many types of networks exist, but they fall under two primary categories: **LANs** and **WANs** *(see Topic 3)*

Software

- Computer software is a general term that describes computer programs or **sets of instructions**.

- Related terms such as software programs, applications, scripts, and instruction sets all fall under the category of computer software.

- Software can be difficult to describe because it is "**virtual**," or not physical like computer hardware.

- Instead, software consists of **lines of code** written by computer programmers that have been compiled into a computer program.

- Software programs are stored as **binary**.

Human resources

- Human resources is used to describe both the **people** who work for a company or organization and the department responsible for managing resources related to employees.

- They are often referred to as the **end-users** of a system.