



System Design *basics*

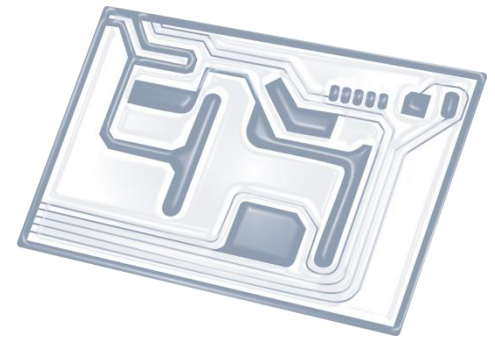
IB Computer Science



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



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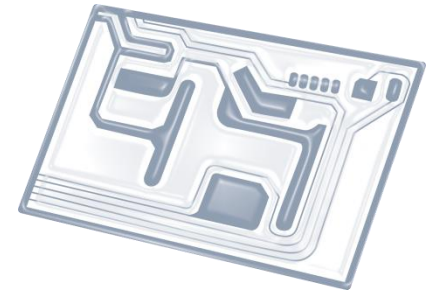


7: Control

D: OOP



Topic 1.2.6



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



Steps in designing a new system

Determine stakeholders

Obtain requirements



Gather information for new system

Start designing/building new system

Before you start ...

- Before you start making a new system, you need to make sure you know exactly **what's going on** at the moment and what **other information** you might need.
- There are four techniques we can use to gather these bits of information:
 - Examining current systems
 - Looking at competing products
 - Organizational capabilities
 - Literature searches (web/books)

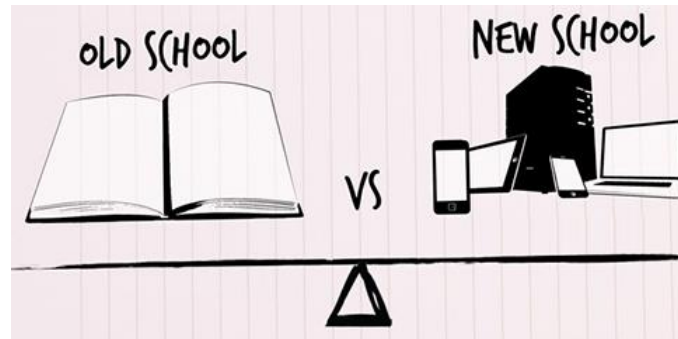


Examining current system

Before you do anything new, see what is currently being done.

- *Who does what?*
- *How do they do that?*

Think about the 5 components of a **computer system**:
hardware, software, network, peripherals, human resources...



Competing products

Next, have a look at what the **competitors** are doing.
The aim is not copy them, but to get an idea of what is possible/being done at the moment.





Warning! Intellectual property

Intellectual property is something unique that you physically create. An idea alone is not intellectual property.

For example, an idea for an app doesn't count, but the lines of code you've written do.

You own intellectual property if you:

- **created** it (and it meets the requirements for copyright, a patent or a design)
- **bought** intellectual property rights from the creator or a previous owner
- have a **brand** that could be a trade mark, e.g. a well-known product name

Don't accidentally break the law!

Organisational abilities

A big consideration before creating a new system is determining what the organisation would be capable of.

- ***Can they afford a new system/new equipment?***
- ***Can the staff use the new system? Training needed?***
- ***Can they have any 'downtime' to upgrade?***



Literature search

Finally, have you **consulted literature** to see what else might be out there?

In IB terms, the term “**literature**” refers to book, magazines, web sites, journals, videos, academic papers...

