



System Design *basics*

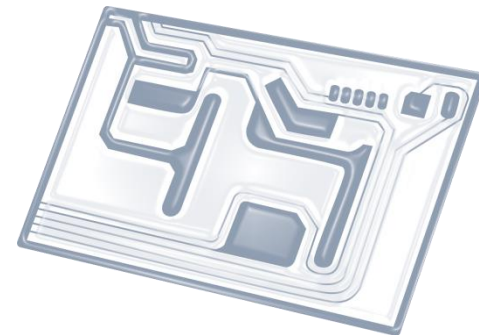
IB Computer Science



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



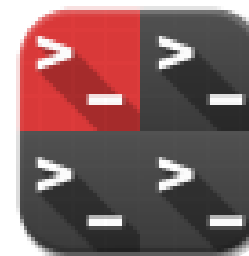
5: Abstract data structures



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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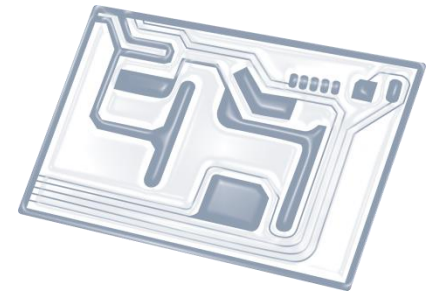
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Topic 1.2.12

Define the term **usability**

A USER INTERFACE IS LIKE A JOKE.
IF YOU HAVE TO EXPLAIN IT,
IT'S NOT THAT GOOD.

How do you *know* how to use a **mobile**?



Did you read an instruction booklet? Did you attend a course on how to use a mobile phone? Did you take an exam?....

If not, why not?

Ergonomics

The scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.

Simply put: ***How well the form fits the function***





Accessibility

Refers to the design of products, devices, services, or environments for people with disabilities or specific needs.

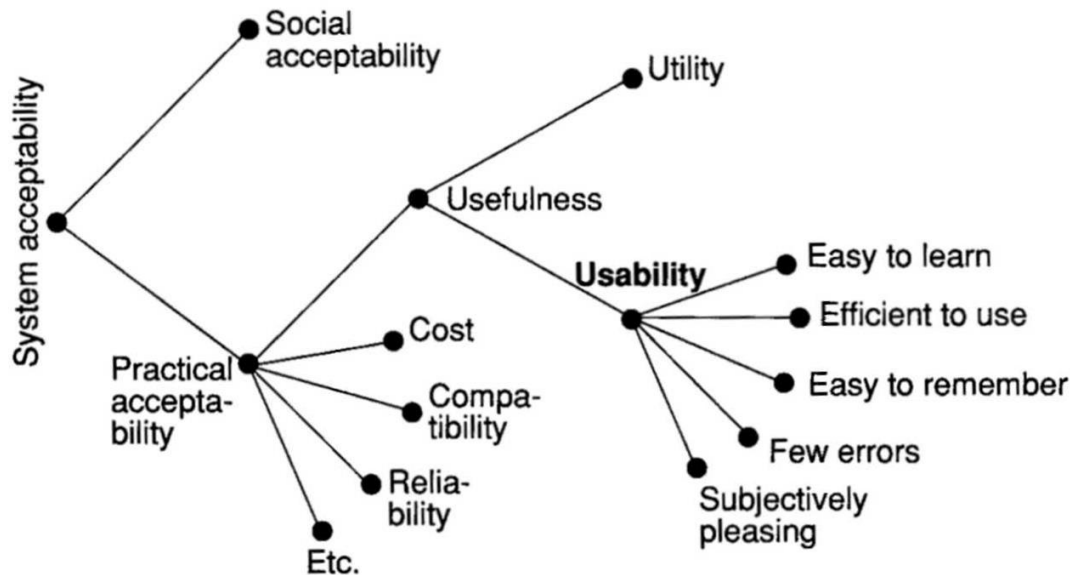
Includes specialist peripherals/software like:

- Braille keyboards
- Eye-typers
- Accessible controllers
- Screen readers
- Voice synthesizers



Usability

The ease of use and learnability of a human-made object. The object of use can be a software application, website, machine, process, or anything a human interacts with





key attribute - **UTILITY** refers to the design's functionality:

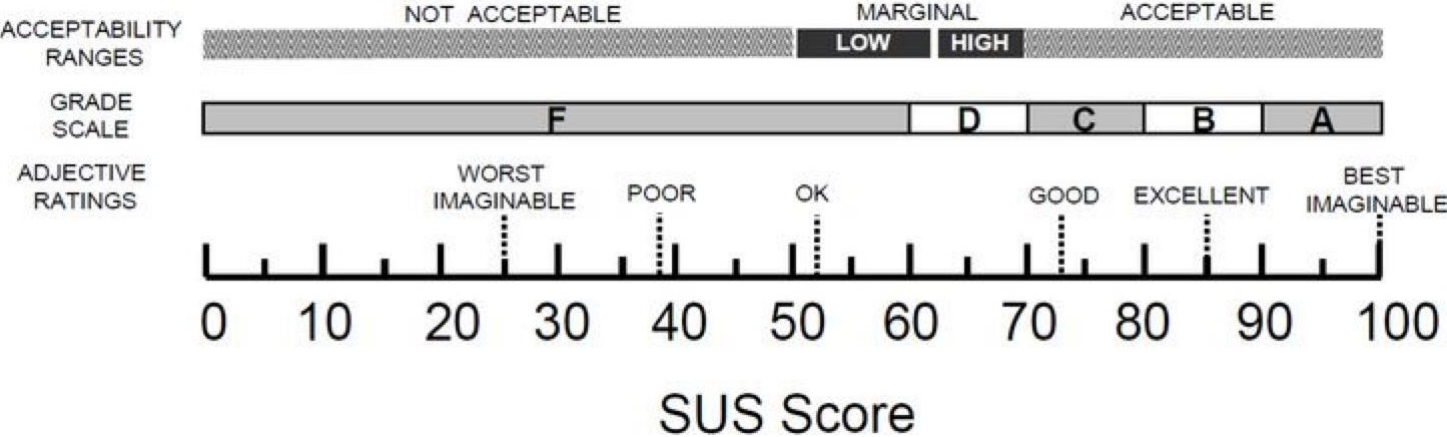
Does it do what users need?

It matters little that something **IS EASY** if it's **NOT WHAT YOU WANT**.

It's also no good if the system can hypothetically **DO WHAT YOU WANT**, but you **CAN'T MAKE IT** happen because the user interface is **TOO DIFFICULT**.

SUS (System Usability Scale)

In systems engineering, the system usability scale (SUS) is a simple, ten-item attitude scale giving a global view of subjective assessments of usability. It was developed by John Brooke at DEC in the UK in 1986 as a tool to be used in usability engineering of electronic office systems.



Although this is **not part of the IB CS curriculum**, it does give a fascinating insight into how usability is judged.