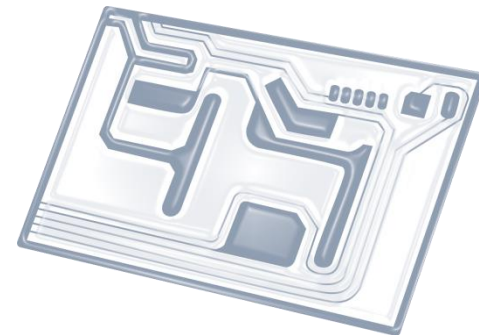# *System Design basics*

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
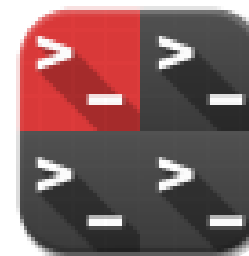
4: Computational thinking

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

2: Computer Organisation

3: Networks

4: Computational thinking

5: Abstract data structures
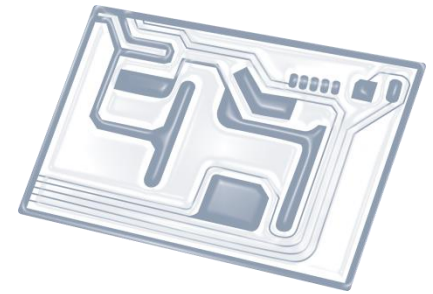
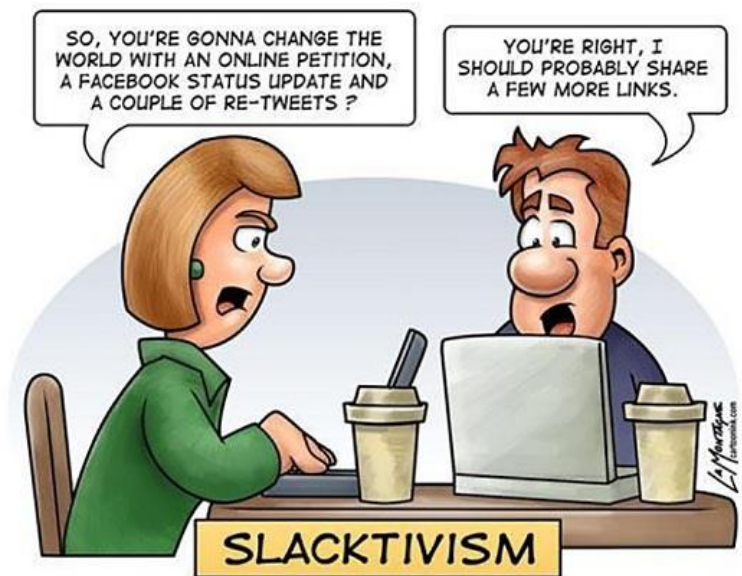6: Resource management

7: Control

D: OOP

Topic 1.2.11

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

What is a social issue?

- A **social issue** is a problem that influences a considerable number of the individuals within a society.

- Examples of social issues are:
    - Crime
    - Health
    - Education
    - Media & Propaganda
   - Poverty
    - Terrorism

SO, YOU'RE GONNA CHANGE THE WORLD WITH AN ONLINE PETITION, A FACEBOOK STATUS UPDATE AND A COUPLE OF RE-TWEETS ?

YOU'RE RIGHT, I SHOULD PROBABLY SHARE A FEW MORE LINKS.

SLACKTIVISM

What is an ethical issue?

- A problem or situation that requires a person or organization to choose between alternatives that must be evaluated as **right** (ethical) or **wrong** (unethical).

- Examples of ethical issues are:
  - Computer crime
  - Responsibility for computer failure
  - Protection of computer property, records and software
  - Privacy

THOU SHALT NOT USE A COMPUTER TO HARM OTHER PEOPLE.

Buzzle.com
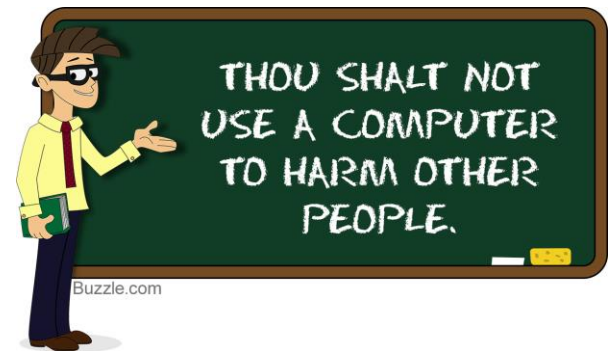
Possible topics for discussion

- Robots replacing humans

- AI algorithms replacing human workers

- New systems being addictive/frustrating/less efficient

- New systems prompting new markets (mPesa/Amazon)

- Accessibility changing work-patterns

- Software changes driving hardware changes and vice versa
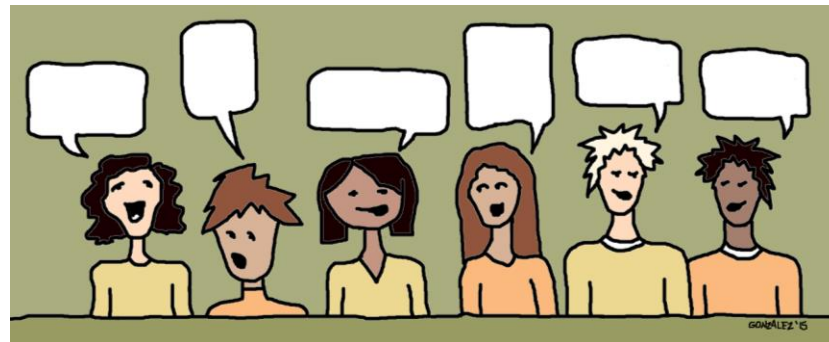
Five videos about new systems

- YouTube: TED Talk - the jobs we'll lose to machines and the ones we won't

- YouTube: TED Talk - Robotics, AI, the end of human work

- YouTube: CGP Grey - Humans need not apply

- YouTube: Intel - The effect of technology

- YouTube: Corning - A day made of glass

You missed a spot over there. Carbon-based units are so useless, I can never understamd why the Motherboard keeps you around!

Exam note!

This curriculum point requires you to **discuss** a social or ethical issue.

That is exam speak for being able to discuss how the introduction of a new system might **change** an organisation for the better/worse.