



J276 1.8 Ethical, legal, cultural and environmental concerns



Stakeholders

A stakeholder is anyone who has an interest in or concern about a product or organisation. The whole population of the world are stakeholders in computer science technologies.

All stakeholders have **responsibilities** to:

- Use computer equipment ethically and not use it to harm others
- Protect the environment and dispose of equipment in the correct way

Stakeholders have **rights** to share in the benefits of using computer equipment but not all of them do.

Environmental Impact

Positives	Negatives
Reductions in the use of paper	Increased energy consumption of digital devices.
Replacement of physical media with downloads reduces material costs	Increased greenhouse gas emissions to meet additional power needs.
Mobile and home working reduces transportation costs	Cost of the transportation of raw and synthetic materials for the production of smart devices.
Smarter devices control their energy usage to meet our needs - this reduces wastage	It is difficult to recycle waste materials from outdated or unwanted technology.
The development of increasingly efficient renewable energy sources.	Devices often include toxic materials.

Cultural implications

- Communication now includes text, pictures and video messaging from any location in the world.
- Social media and blogs allow the publication of our thoughts worldwide and politicians and entertainment stars can be contacted directly.
- Medical advances (full body scanners, smart watches) monitor our body and transmit the data online. Computer simulations analyse biological viruses and new medicines.
- Educational content can be accessed anywhere and resources shared.

Digital Divide: the increased access to technology is not consistent across the world or even within countries. Many countries/areas are limited by financial or geographical constraints and broadband internet connections are not yet available everywhere. This lack of access can then expand the divide further. For example: some jobs are advertised initially only online and customers can usually find cheaper products and household devices through the internet.

Ethical implications

The ethical use of computer technology means that trying to cause no harm to others and acting in a morally responsible way to improve society. This applies to our own use of technology and how others treat us.

Robots and automated devices are ideal for situations that may be dangerous to humans or for jobs that are extremely repetitive, but what happens to those who are being replaced?

Privacy Implications

Our increased use of technology, for example smartphones, social networking and internet-connected devices means that our actions are often recorded without us knowing it .e.g. GPS technology, cookies, social networks asking for personal information, search histories on internet browsers, streaming services logging our music and video choices.

Computing Legislation

Data Protection Act 1998	Computer Misuse Act 1990	Copyright, Designs and Patents Act 1988	Creative Commons Licensing	Freedom of Information Act 2000
<p>Created to protect the personal information held about individuals within organisations.</p> <p>The main principles are:</p> <ul style="list-style-type: none"> • Data should be fairly and lawfully processed • Data must be obtained and used only for specified purposes • Data shall be adequate, relevant and not excessive • Data should be accurate and kept up to date • Data should not be kept for longer than necessary • Access must be granted to data subjects to enable them to check and correct their entries • Data must be kept safe and secure • Data should not be transferred outside the EEA (European Economic Area) to another country without adequate protection legislation 	<p>Designed specifically to prevent hacking and the damage of computer systems by the following means:</p> <ul style="list-style-type: none"> ○ Intentional unauthorised access to programs or data that are not normally accessible ○ Unauthorised access to material that could be used for further criminal activities ○ Intentional damage to data or software using malware 	<p>Provides the creators of music, books, films and games with the right to control how their products are accessed and sold. This means that no one else has the right to copy or sell their work without permission.</p> <p>Using the internet to access and downloaded free copies of such copyrighted material is therefore illegal, as no money or credit will have passed to the original creator.</p>	<p>The Creative Commons organisation provides licences that allow people to use, share or edit pieces of work, depending on the licence given.</p> <p>The licences include:</p> <ul style="list-style-type: none"> • Public domain - no restrictions on use for any purpose • Attribution - the original creator must be credited if the work is copied or used. • Attribution-non-commercial - work can be used only for non-commercial purposes. 	<p>This act provides the public with a right to access information held by central and local governments.</p> <p>All request must be considered but can be refused under certain circumstances.</p>

Open Source vs Proprietary Software

Open Source

- Created to be shared openly online at no cost, with no limits on how it can be edited, copied or distributed.
- Examples include: Linux, GIMP (GNU Image Manipulation Programme) and Audacity.

Proprietary Software

- Owned by the individual or company who created it.
- Permission to use the software is usually purchased through a licence, and the software cannot be edited or shared in any way.

How 1.8 Exam Questions are marked:

	AO2.1a	AO2.1b
High (thorough) (6 – 8 marks)	Precision in the use of terminology. Knowledge shown is consistent and well-developed. Clear appreciation of the question from a range of different perspectives making extensive use of acquired knowledge and principles of computer science.	Understanding of concepts is consistently applied to context enabling a logical and sustained argument to develop. Examples used enhance rather than detract from response.
Middle (reasonable) (3 – 5 marks)	Awareness of the meaning of the terms in the question. Knowledge is sound and effectively demonstrated. Demands of question understood although at times opportunities to make use of acquired knowledge and concepts are not always taken	Understanding of concepts is shown and is applied to context. There is clear evidence that an argument builds and develops through the response but there are times when opportunities are missed to use an example or relate an aspect of understanding to the context provided.
Low (basic) (1 – 2 marks)	Confusion and inability to deconstruct terminology as used in the question. Knowledge partial and superficial. Focus on question narrow and often one-dimensional.	Inability to apply understanding of key concepts in any sustained way to context resulting in tenuous and unsupported statements being made. Examples if used are for the most part irrelevant and unsubstantiated.
0 marks	No response or no response worthy of credit.	No response or no response worthy of credit.