AQA Computer Science A-Level

4.8 Consequences of uses of computing

Notes

Specification:

4.8.1 Individual (moral), social (ethical), legal and cultural issues and opportunities:

Show awareness of current individual (moral), social (ethical), legal and cultural opportunities and risks of computing.

Understand that:

- developments in computer science and the digital technologies have dramatically altered the shape of communications and information flows in societies, enabling massive transformations in the capacity to:
  - monitor behaviour
  - amass and analyse personal information
  - distribute, publish, communicate and disseminate personal information

- computer scientists and software engineers therefore have power, as well as the responsibilities that go with it, in the algorithms that they devise and the code that they deploy

- software and their algorithms embed moral and cultural values

- the issue of scale, for software the whole world over, creates potential for individual computer scientists and software engineers to produce great good, but with it comes the ability to cause great harm.

Be able to discuss the challenges facing legislators in the digital age.

Issues and opportunities

Moral issues

Moral issues are those that concern an individual's sense of right and wrong. For example, some people happily download and use paid software without purchasing a licence while others don't feel that the practice is morally correct. A person's morals can be influenced by the people around them. For example: friends, family or teachers.

Ethical issues

Ethical issues relate to society and its sense of what is right or wrong. Ethical issues include the use and misuse of personal data. In general, society believes that personal data should be stored securely and not used for anything other than the purpose for which it was collected.

Cultural issues

Cultural issues arise from the differences in moral values between people in different geographical areas. In the UK, people are generally happy for photographs containing them to be taken in public and shared online. In other countries, this would not be seen as acceptable. When creating a new computer system, computer scientists must consider where their system is going to be used and what people's attitudes towards it would be.

Legal issues

Legal issues are those that relate to the law. There are a number of laws in the UK that specifically relate to the use of computers and computer systems. Examples of these include: The Computer Misuse Act 1990, The Data Protection Act 1998, The Freedom of Information Act 2000 and The General Data Protection Regulation 2016.

Lawmakers face great challenges in the digital age. Enforcing copyright has been made increasingly difficult with the growth of the Internet, individuals are difficult to trace online and international online services have to be made to comply with laws from all of the countries in which they operate.

> **Note**
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> Exam questions are often based on commenting on issues relating to a real-life scenario in which computer science has affected society.

Developments in computer science

Advances in computer science and other digital technologies have changed the way in which society communicates. New technology has brought with it developments in the capability to monitor behaviour and to gather, analyse, distribute and publish personal information, sometimes against the will of society.

The role of computer scientists

The people with the power to improve the usage of computer systems are computer scientists and software engineers, but with power comes responsibility. Computer scientists must always be aware of the moral and social aspects of their work as well as their potential to produce systems that assist and support millions of people around the world.

Examples for case studies

In 2017, Channel 4 News started an investigation into Cambridge Analytica's actions relating to the 2016 US Presidential Election. Ethical and privacy issues were raised when personal data was collected from sources including Facebook users without their consent.

WannaCry, a piece of ransomware, targeted computers running Microsoft Windows in 2017. The ransomware had a significant global impact and affected NHS computer systems in England and Scotland.