Topic 5 Ethics and Laws

What is a legal issue?

A legal issue is a problem or dispute concerning the interpretation, application, or violation of laws

Examples of legal issues in computing are:

Copyright - The use of other peoples content without permission

Cybersecurity - Protecting against hackings, data breaches and all other cybercrimes

Data protection - Responsible collection, storing and use of personal information

Intellectual Property (IP):
Protecting software, music, and creative works from illegal copying (piracy) or theft.

What is an ethical issue?
An ethical issue is a situation that raises questions about what is right and wrong

What is a social and cultural Issue?
The digital divide, privacy concerns in surveillance, and the impact of social media.

Data Privacy and Protection:
The obligation to manage personal data securely, ensuring it is accurate, relevant, and not kept longer than necessary.

Example of personal data:
Examples of how personal data can be collected include:

- GPS
- Number plate/face recognition
- Smart listening devices
- Signing up to services, organisations and products
- Customer surveys
- Electronic tagging
- Official purposes - council/government/medical services

The collection of personal data raises many ethical and legal issues such as:

- Privacy
- Data protection
- Misuse
- Cookies

Examples of privacy issues in computing

Face recognition
The increase in cameras and advances in technology means face recognition is possible, whilst this can mean an advantage in crime prevention/detection, people are concerned about privacy. Privacy concerns include, what else is being watched? and who is watching?

GPS
GPS is built-in to most smart phones and brings with it a number of features that many see as a benefit, 'find my phone 'for when it gets lost/stolen, location tagging in photos and for navigation software. Some users are concerned with where this data is kept? , who might have access to it? and is it being used for any other purposes?

Internet monitoring
Most schools and businesses use monitoring software to track their students' and employees' internet activity
Social media companies also employ similar tools to detect and remove illegal or harmful content like hate speech, misinformation, or violent threats Arguments for, these measures promote responsible online behaviour and prevent Cyberbullying Arguments against, concerns about limitations to free speech, potential abuse by authorities who control the monitoring systems, and biased algorithms leading to censorship

Data protection legislation

What is the data protection legislation?

Data protection legislation is a law that ensures **personal data is collected, stored, and used fairly, safely, and only for specific purposes**.

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Data Protection Act principles

The Data Protection Act requires organisations to handle personal data according to key principles:

- **Lawfulness and fairness:** Data must be collected and used legally and fairly
- **Purpose limitation:** Data should only be used for the purpose it was collected
- **Data minimisation:** Only collect data that is necessary
- **Accuracy:** Data must be kept accurate and up to date
- **Storage limitation:** Data should not be kept longer than necessary
- **Security:** Data must be kept secure against unauthorised access

Give two pieces of information that organisations must tell people when requesting consent to use their personal data.

- That they are giving consent for the organisation to store data
- What the data is being collected for
- What processing will be done on their data
- That they can withdraw consent at any time
- How long it will be stored
- That the data will be stored securely

AI and Robotics:

Ethical concerns involving accountability, safety, bias in algorithms, and legal liability when autonomous systems fail.

Issue	Description	Example
Accountability	Who is responsible when AI makes a mistake?	Self-driving car causes an accident — who is liable?
Bias	AI systems may reflect biases in training data	Facial recognition less accurate for certain demographics
Safety	Ensuring AI systems operate safely	Medical diagnosis AI must be reliable
Job displacement	Automation replacing human workers	Robots in factories, automated customer service
Privacy	AI systems processing personal data	Facial recognition in public spaces

Causes of algorithmic bias

- Machine learning having been trained using insufficient/inappropriate data
- Human bias leading to discrimination and a lack of fairness
- Poor design of the algorithm

Methods available to reduce the risk of algorithmic bias

- Human oversight and 'sense checking' and confidence/error ratings of predictions
- Governance (anticipating and managing risks and make sure legal requirements are adhered to)
- Improve the training data

Environmental Impact:

The energy consumption of data centers, the lifespan of devices, and the disposal of electronic waste (e-waste).

Stage	Environmental issue	Key exam phrases
Manufacture	Extraction of raw materials, energy used in production	"Extraction of metals", "fossil fuels used", "water consumption"
Use	Energy consumption during operation	"Electricity consumption", "carbon footprint", "data centres"
Disposal	E-waste, toxic materials, landfill	"E-waste", "hazardous materials", "landfill", "pollution"
Replacement cycle	Frequent upgrades increase all of the above	"Shorter replacement cycles", "more manufacturing", "more disposal"

Actions:

- Use it as long as possible/don't replace it
- Sell/give it to a company that will recondition it
- Give it away to a friend or charity
- Repair it if it breaks
- • Keep the software updated

Intellectual property protection

- Intellectual property (IP) refers to creations of the human intellect and how copyright, patents and trademarks protect IP.
- Licensing allows the creator of a software application to specify how it can be used and distributed.
- Difference between open-source and proprietary licences.
- Patent protects intellectual property

Protection type	What it protects	Example
Copyright	Creative works (text, music, images, software code)	A song, a photograph, a computer program
Patent	Inventions and new processes	A new type of processor, a hardware invention
Trademark	Brand names, logos, slogans	Company logo, product name, advertising slogan
Licensing	Grants permission to use protected work under specific terms	Software licence, music streaming rights

Patents

- A patent prevents someone copying/using/selling an invention because it gives the inventor the exclusive right to reproduce/use/sell it for 20 years.
- A person/organisation that infringes a patent can be prosecuted, because it gives the inventors the legal protection to defend their exclusive right