Networks, media and automation

IB DP Digital Society Networks, media and automation full package

Networks, media and automation

- explain how computers and networks work and who controls each layer of the **internet**;
- distinguish **misinformation** from **disinformation** and explain why false news spreads;
- explain machine learning and the difference between narrow, generative and general AI;

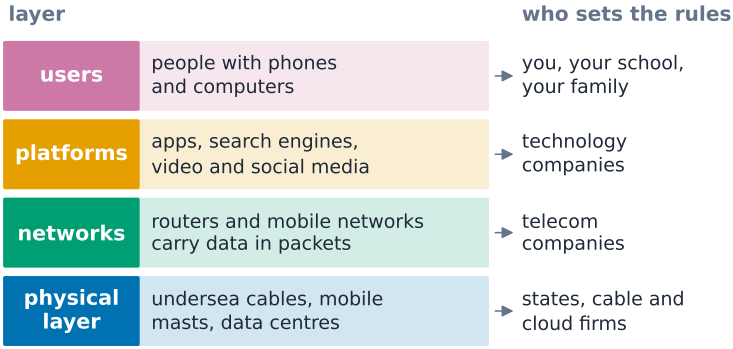
Networks, media and automation (2)

- explain how robots sense, decide and act, and who is responsible when an **autonomous** system fails;
- read a **source** for its **claim**, perspective, origin and purpose, and plan a Paper 2 answer.

Computers and networks

- A **computer** runs **software** (instructions) on **hardware** (the physical machine).
- For decades the number of transistors on a chip roughly doubled every two years, so computers became smaller, cheaper and more powerful.
- A smartphone today is a powerful computer that most people carry everywhere.
- The **internet** is a network of networks.

Figure: Computers and networks

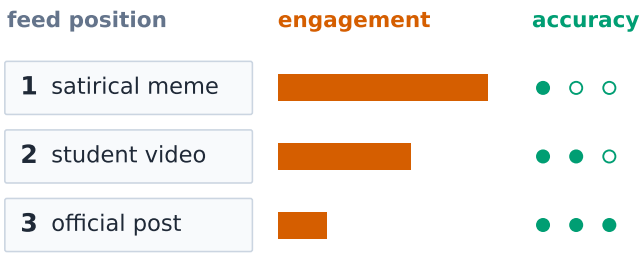


- Each layer has owners, and each owner can set rules for the layers above it.
- Match each part of the diagram to the text.

Media

- **Creation**: anyone with a phone can publish text, photos and video.
- **Distribution**: a feed is ranked by an algorithm, usually by **engagement** (likes, shares, comments, time watched), not by date or by accuracy.
- **Participation**: users comment, share, remix and join campaigns.

Figure: Media



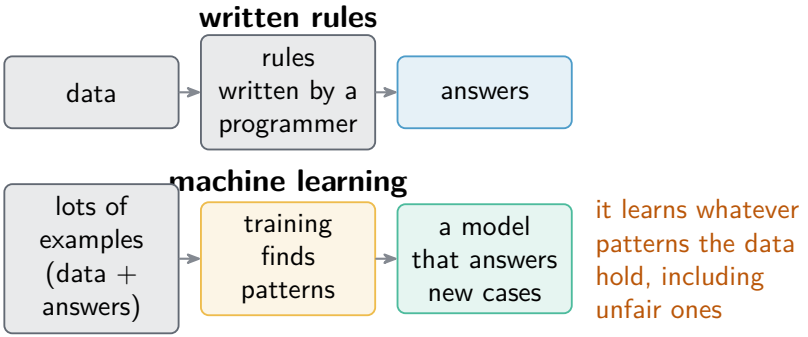
The ranking rule reads engagement only, so the least accurate version travels furthest (schematic).

- The feed ranks by **engagement**, so the least accurate version rises to the top.
- Match each part of the diagram to the text.

Artificial intelligence

- **Artificial intelligence** is **computer** systems doing tasks that usually need human intelligence, such as recognising faces, translating or writing.
- Most modern AI uses **machine learning** : instead of following rules written by a programmer, the system finds patterns in large amounts of data.
- AI raises questions in every context: who owns the data it learned from (economic), whether its answers are true (human knowledge), and whether it treats groups fairly (social).

Figure: Artificial intelligence



- Rules are written; **machine learning** finds patterns, fair or not.
- Match each part of the diagram to the text.

Robots and autonomous technologies

- A **robot** is a machine that senses its surroundings, makes decisions and acts in the physical world.
- An **autonomous** technology acts without a human controlling each step: a warehouse **robot**, a delivery drone, a self-driving car.
- Since 2022 Baidu's Apollo Go robotaxis have carried passengers with no safety driver in parts of Wuhan and other Chinese cities.
- When an **autonomous** machine makes a mistake, who is responsible?

Working with sources

- Sources: the 2018 *Science* study (researchers: false news spreads faster); a platform statement about labelling false posts (company: the problem is under control).
- Own example: the 2011 salt panic, which spread by text message as well as social media, so the problem is older than today's apps.
- Judgement: social media makes false information faster and wider, but ranking by **engagement** is the main cause, and it can be changed.

Sources for this lesson

- International Baccalaureate, *Digital Society guide* (first assessment 2024) and the specimen Paper 2.
- S. Vosoughi, D. Roy and S. Aral, "The spread of true and false news online", *Science* 359 (2018).
- US National Transportation Safety Board, *Collision Between Vehicle Controlled by Developmental Automated Driving System and Pedestrian, Tempe, Arizona, March 18, 2018* (2019).

Sources for this lesson (2)

- Reports on the 2011 salt panic in China, Xinhua and *China Daily* (March 2011).
- DeepMind, *AlphaGo* (2016).

Common errors

- Using "**misinformation**" and "**disinformation**" as the same word; disinformation is false on purpose.
- Saying feeds show posts "in order"; most feeds are ranked by an algorithm, usually by **engagement**.
- Calling any clever program "general AI"; general AI does not yet exist, and today's systems are narrow or generative.

Common errors (2)

- Saying a self-driving car "decided" without asking who designed, tested and supervised it.
- Quoting a **source** without asking who made it, when and why.
- Using several sources that all share one **perspective** and calling them diverse.

Key terms

- **Internet**: a worldwide network of networks that passes data in packets.
- **Engagement**: how much users interact with content: likes, shares, comments and time watched.
- **Misinformation**: false information shared by people who believe it is true.

Key terms (2)

- **Disinformation**: false information spread on purpose to deceive.
- **Machine learning**: a way of building AI in which the system finds patterns in large amounts of data instead of following rules written by a programmer.
- **Generative AI**: AI that produces new text, images or sound from patterns in its training data.
- **Autonomous**: able to act without a human controlling each step.

Check yourself

- 1.
- Give one layer of the **internet** and say who controls it. 2.
- Was the 2011 salt rumour **misinformation** or **disinformation**?
- Explain. 3.