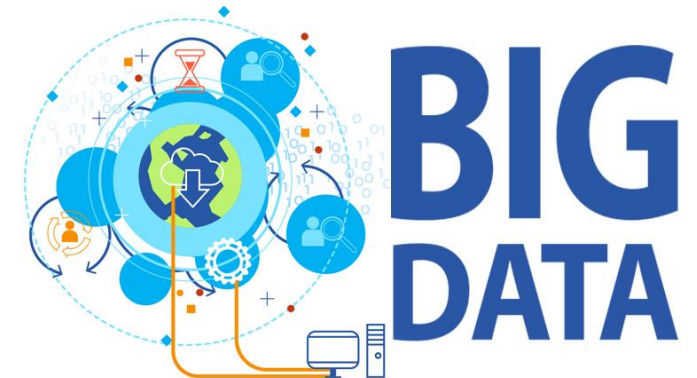


Big Data

Unit R012 - Understanding tools, techniques, methods and processes for technological solutions

Introduction

- **Big Data** is the term given to these **large sets of data** that is being **collected, processed and stored** is growing on a daily basis.
- Big data sets are so **big** and complex that they are usually measured in **petabytes** or **exabytes**.
- How the data is processed is key too. Data can be **taken** from **any source** to be **processed** and analysed in order to **find trends**.



Introduction

- Data can be used in many different areas or applications.
- Some of these are:
 - Law Enforcement
 - Education
 - Health and Fitness
 - Shopping
 - Entertainment and Leisure
 - Lifestyle

Law Enforcement

- Law Enforcement use a **Automatic Number Plate Recognition** system (ANPR) in some cars.
- This system **checks** every **number plate** it sees **automatically** with the DVLA database to see if **drivers** have driving **licenses** and cars are fully **taxed, insured** and have an **MOT**.
- These checks are done almost instantly and if a **problem** is found then this is **displayed**.



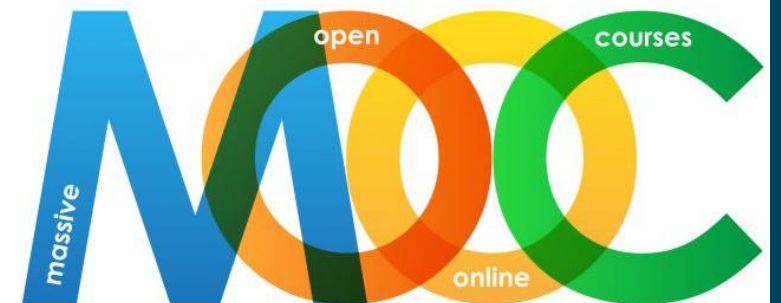
Law Enforcement

- **Speed cameras** on motorways use a similar system. As a **vehicle passes** a **measurement** of its **speed** is taken.
- If a vehicle is travelling **above** the **speed** limit then an image of the number plate is taken and sent to the **DVLA** to issue a **speeding notice**.
- **CCTV cameras** are used to **monitor locations**.
- Some CCTV systems link to **facial recognition** and police databases. This allows **suspicious people's** movements to be **tracked**.



Education

- Data in education can be **analysed** to show **how well students** are doing and how much **progress** they are making. Student's **Attendance** data is also analysed.
- Many colleges and universities offer **Massive Open Online Courses** (MOOCs) as a way to **collect data** from those that complete the **course** and **provide** them with a **grade** once complete.
- The data collected can help inform **decisions** about **changes** to **content** of the **MOOCs**.



Health and Fitness

- We have looked at how wearable technology can be used to track progress of the person wearing it.
- **Research gathered** by these **devices** can be **shared** to aid **research** into diseases such as **Cancer**.
- Some researchers are using **apps** to **collect data** from a wide range of people such as **blood sugar** levels for **diabetes**.



Shopping

- We have also looked at how retailers can offer loyalty schemes.
- **Retailers capture** data from the **customer every time** the card is used to **analyse trends** and **patterns**.
- They may want to see which **products** should be on **special offer** or how many of **products** are **in stock** or are **needed**.



Entertainment and Leisure

- Big Data is **collected** each time a **film** or **music** track is **streamed**.
- **Decisions** to **make** some films/TV shows are based upon how much **money** they have made or **viewing figures**.
- By gathering this information some **companies** are able to **suggest programmes** that we might like based upon **viewing patterns**.
- Netflix show *The House of Cards* was commissioned purely on the analysed data relating to viewing habits of subscribers.



Entertainment and Leisure

- Music streaming services like **Spotify suggest tracks** and artists we might like **based** on **past** music **download** performances.
- By looking at viewing **histories, searches, reviews** and **ratings** producers can provide content that is wanted.
- Information like user **age, time viewed** and **device used** are also collected.
- It is possible to provide **advertising** to viewers, **based** on this specific **data** too.



Lifestyle

- There are many lifestyle applications that use Big Data.
- Some **cars** may have **SOS systems** built in that **sends data** to an **assistance** team so that help can be sent.
- **Cars** may also have **tracking** systems built in too so if the car is **stolen** then a **signal** showing the **location** of the vehicle can be sent to the **police**.



Lifestyle

- Some **houses generate solar power** by having **solar panels** on their roof. This will **power** their own **house** and may allow power to be **sold** back to the **National Grid**.
- This data will be **analysed** to see where the **best places** for solar panels to be located are.
- Some houses may also use **smart meters** to show how much **gas** and **electric** is being used.
- This allows a customer to see **accurate bills** and to see **when** they use the **most power**.



Lifestyle

- Some **houses** have **connected** locks that can **report** to the **owner** and **security** company if there is any **movement in/out** of the house.
- The data is fed back to the **security** company who will **alert** the **police**.
- **Insurance** companies can also use this data to find **risky areas** and this could be used to set **house insurance prices** in future.



Lifestyle

- Lifestyle data can also be collected through social media by looking at **likes, shares, retweets** or **comments**.
- Using this Big Data can help **marketing** companies **target products** to the correct **target market**.



Benefits and Drawbacks of Using Data

Advantages	Disadvantages
Large amounts of data can be found using a range of data stores	It is not always possible to know if the data is correct, if it has been gathered by somebody else.
Searches can be made to find the specific data required	Errors in the data can have a negative impact on people.
Time does not have to be wasted collecting new data.	It may not be possible to get the specific data required
Data can be shared by teams carrying out the same task.	Data must be kept up to date, with the data owners being informed when updates are made.
A range of different analyses can be carried out on data.	Incorrect data can lead to incorrect results
Data stores can interact to share data.	Sensitive data must be securely stored with good data security measures.