

# Managing Data and its Implications

Lecture Title: What is Data?



Lecturer: Angelito Sciberras

Date: 16 February 2025

Undergraduate Diploma

# Self-Assessment - Session 01



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# Groups

- Diploma in Business Administration

- Group 1

Lovely Bhatia

Surendra Thapa

Jyoti Rawal

Raju Nagarkoti

Ketav Sood



# Groups

- Diploma in Business Administration

- Group 2

Anita Limbu

Varinder Singh

Navjot Singh Batth

Muhammad Farooq

Nirmal Rayamajhi



# Groups

- Diploma in Business Administration
- Group 3
  - Sahil Beniwal
  - Sidhant
  - Sumit Bamma
  - Bibek Darai
  - Abishek Dhungana
  - Rina Karki



# Groups

- Diploma in Business Administration
- Group 4
  - Maldika Biswakarma
  - Muhammad Ahmed Butt
  - Muhammad Yaseen Riaz
  - Dhaniram Baral
  - Bishnu Prasad Jaiswal



# Groups

- Diploma in Business Administration
- Group 5

Manjeet

Muhammad Mubeen Zafar

Harini Kundur

Sajid Afridi Shaik





# Groups

- Diploma in Business Administration
- Group 6

Ashok Kumar Thapa

Ikechukwu Dike Onyeme

Jeevan Hamal

Yogesh Shakya



# What is Data?



# Data

- "datum," which means "something given."
- plural form of "datum" is "data," but some people still use "data" as a singular noun
- in the early days of computing, "data" referred specifically to numerical values that were processed by machines.



# Data

- today include any kind of information that can be processed by computers, including text, images, and video.
- often used interchangeably with other terms like "information" and "knowledge"
- as technology continues to advance, the definition and scope of "data" will likely continue to evolve.



# Data

- facts
- figures
- measurements
- amounts
- descriptive information

that we gather for **analysis** or **reference**



# Data

Factual information used as a basis for

- reasoning
- discussion
- calculation
- publishing
- decision-making



# Data

“facts or information, especially when examined and used to find out things or to make decisions.”

- Oxford Dictionary





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# Data

## Qualitative vs Quantitative



# Qualitative vs Quantitative



# Data

## Qualitative

- describes things, i.e., it is descriptive information



# Data

## Qualitative



**Appearance:** Polar bears are typically white with black skin underneath. They have a large head, a long neck, and a stocky body with a thick layer of fur to help them stay warm in their cold environment.



# Data

## Qualitative



**Behaviour:** Polar bears are excellent swimmers and can travel long distances in search of food. They are also skilled hunters and can catch fish and other prey both on land and in the water. Polar bears are generally solitary animals, except for mating and raising cubs.

# Data

## Qualitative



**Habitat:** Polar bears live in the Arctic region and are adapted to living in a cold, snowy environment. They are often found on sea ice, where they hunt for food and rest. The melting of sea ice due to climate change is a major threat to the survival of polar bears.



# Data

Qualitative



**Importance:** Polar bears play a crucial role in the Arctic ecosystem and are considered a keystone species. They help regulate the population of other animals, such as seals, and are an important cultural symbol for many indigenous communities in the Arctic.



# Data

Qualitative



**Other:** social interactions, communication, or cultural significance.





# Data

## Quantitative

numerical information, i.e., numbers, statistics, measurements, etc.



# Data

## Quantitative



**Size:** Adult male polar bears can weigh up to 600-800 kg (1323-1764 lbs) and can reach a length of 2.4-3 meters (7.9-9.8 feet). Females are typically smaller, weighing up to 300-500 kg (661-1102 lbs) and reaching a length of 1.8-2.4 meters (5.9-7.9 feet).



# Data

## Quantitative



**Population:** The global polar bear population is estimated to be around 22,000–31,000 individuals, with the majority living in Canada. Polar bear populations are declining due to habitat loss and other threats from climate change.



# Data

## Quantitative



**Diet:** Polar bears primarily eat seals, but their diet can also include fish, birds, and other mammals. A single polar bear can consume up to 50 kg (110 lbs) of food in a single meal.

# Data

Quantitative



**Reproduction:** Female polar bears give birth to litters of 1-4 cubs, usually in a den made of snow. Cubs stay with their mother for 1-2 years before becoming independent.



# Data

Quantitative



**Behaviour:** Polar bears can swim for long distances and can hold their breath for up to two minutes. They are also capable of walking long distances over sea ice and can travel up to 50 km (31 miles) in a day.

# Data

Quantitative



**Other:** information about their body temperature, heart rate, or metabolic rate.



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# Data

# Binary



# Data



# Data

## Measuring Data



# How is Data Measured?



# Measuring Data

Types of data:

Text

Images

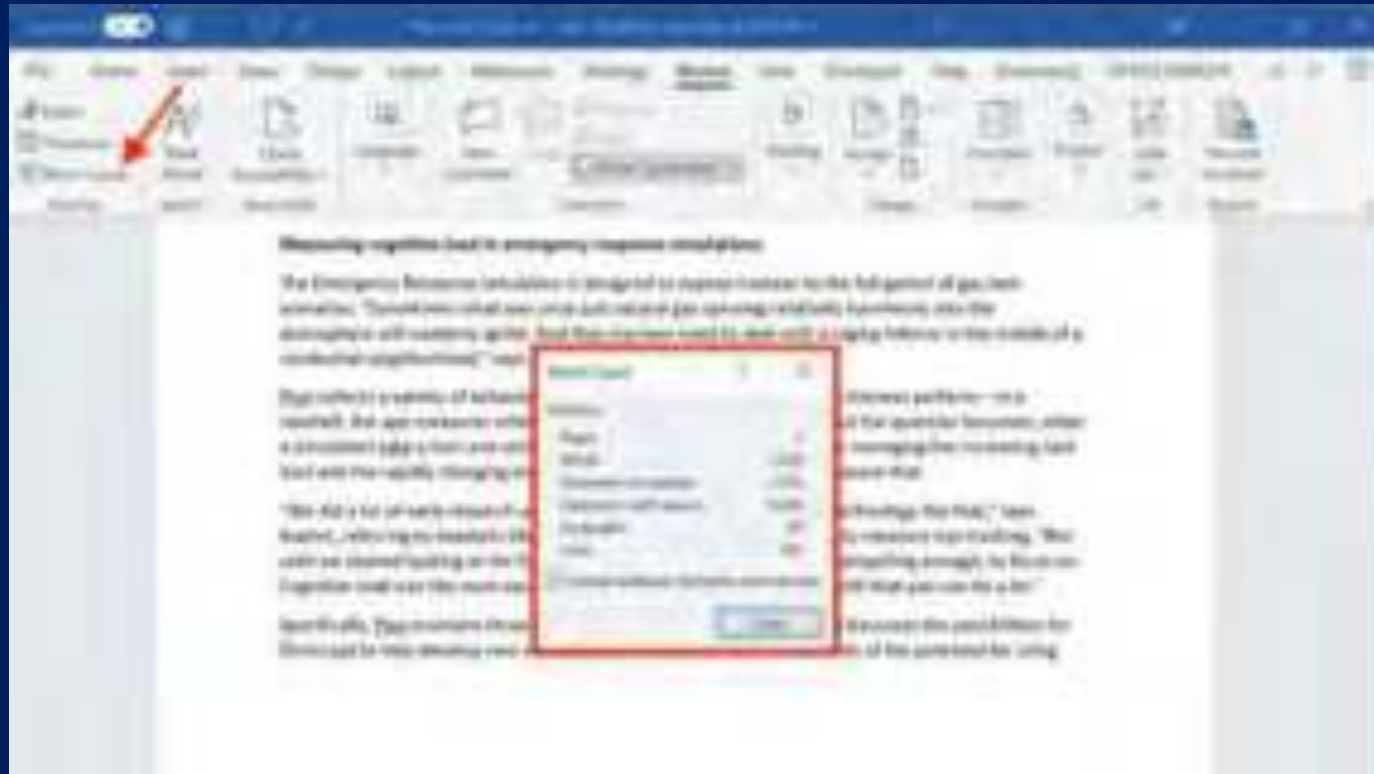
Audio

Video



# Data

Text: Text data can be measured in terms of its length, typically using character or word counts.



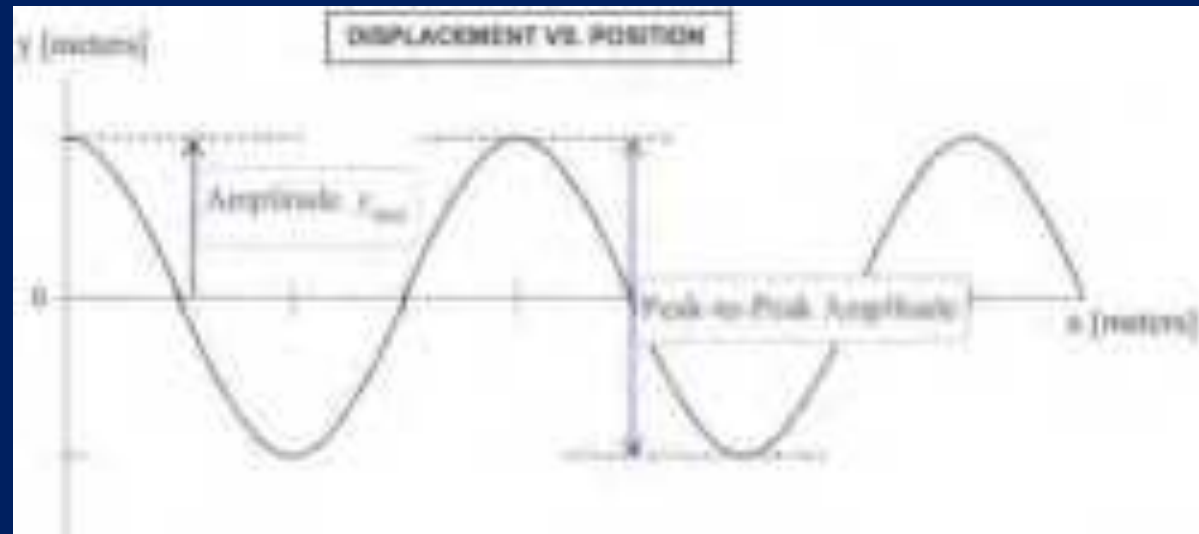
# Data

Images: Image data can be measured in terms of its resolution, which refers to the number of pixels in the image.



# Data

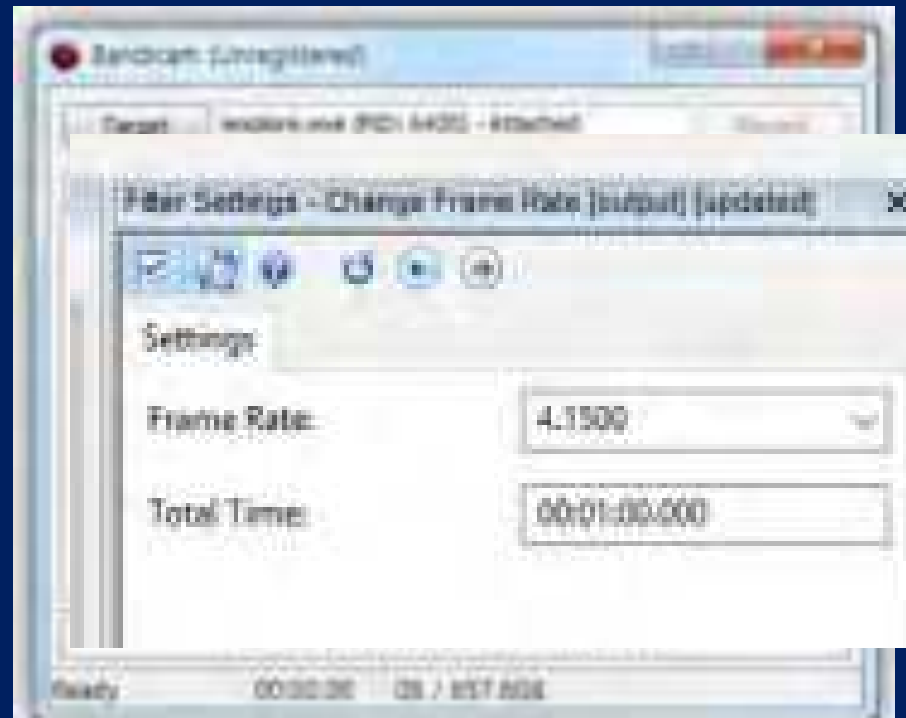
Audio: Audio data can be measured in terms of its frequency, amplitude, and duration.





# Data

Video: Video data can be measured in terms of its frame rate, which refers to the number of frames per second.



# Data

data can also be measured in terms of its

- quality
- accuracy
- completeness

*data is reliable and useful for its intended purpose*





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# Data

## Storing Data



# How is Data Stored?



# Data Storage

## Physical

Cabinets

Paper

Photographs

Magnetic Tape

## Electronic

Flash Drives

CDs, DVDs, Blue Ray

Hard Drives

Servers



# Data

Storage: units used to measure the size or capacity of digital storage devices such as hard drives, solid-state drives (SSDs), or flash drives.



# Digital Storage





# Data

Computer bit and byte

A **bit** is a value of either a 1 or 0 (on or off).

**Nibble**

A nibble is 4 bits.

**Byte**

Today, a byte is 8 bits.

1 character, e.g., "a", is one byte.



# Data

## Megabyte (MB)

1,048,576 bytes or 1,024 kilobytes.

4 books (200 pages or 240,000 characters).

## Gigabyte (GB)

1,024 megabytes, or 1,048,576 kilobytes.

4,473 books (200 pages or 240,000 characters).



# Data

## Terabyte (TB)

1,024 gigabytes, or 1,048,576 megabytes.  
4,581,298 books (200 pages or 240,000 characters).

## Petabyte (PB)

1,048,576 gigabytes, or 1,073,741,824 megabytes.

4,691,249,611 books (200 pages or 240,000 characters)



# Data

Term	Capacity	Abbreviation
Bit	0 or 1 value	b
Byte	8 bits	B
Kilobyte	1024 bytes	KB
Megabyte	1024 KB	MB
Gigabyte	1024 MB	GB
Terabyte	1024 GB	TB
Petabyte	1024 TB	PB
Exabyte	1024 PB	EB
Zettabyte	1024 EB	ZB
Yottabyte	1024 ZB	YB





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# Data

# Big Data



# Data

## Big Data

- consists of at least **one petabyte** of information.



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# Data

## Big Data

sets of information that are **too large** or **too complex** to handle, analyse or use with standard methods

- - Oxford Dictionary





# Data

## The 7Vs of Big Data



# Data

## Volume

2,300,000 employees

37 million customers per day

Data of 145 million US customers

300,000 social mentions every week

2.5 petabytes of unstructured data from 1 million customers every hour

10,500 stores worldwide of which 4,500 in the USA



# Data

Volume



Halloween sales

Special Cookie very popular in most stores

Two stores not selling any at all

Why?



# Data

## Variety

Data being stored and needs to be processed

- audio files
- video files
- Photos
- GPS data
- medical files
- instrument measurements
- Graphics
- web documents
- bonus cards
- internet search behaviour



Data

Variety

Predictability

Lookalikes

Identification of potential customers



# Data

## Velocity

involves the condition that you need to **process your data within minutes or seconds** to get the results you're looking for.



# Data

## Velocity

Every day, some **93,000 flights** take off from approximately **9,000 airports**. At any given time, there are **between 8,000 and 13,000 airplanes** in the air.



# Data

## Velocity

Can you imagine if the information is not real-time?

How does it work?





# Data

## Value

What value you can get from which data and how **big data gets better results** from stored data

how meaningful the data



# Data

## Value

Identify customer location and need for more infrastructure

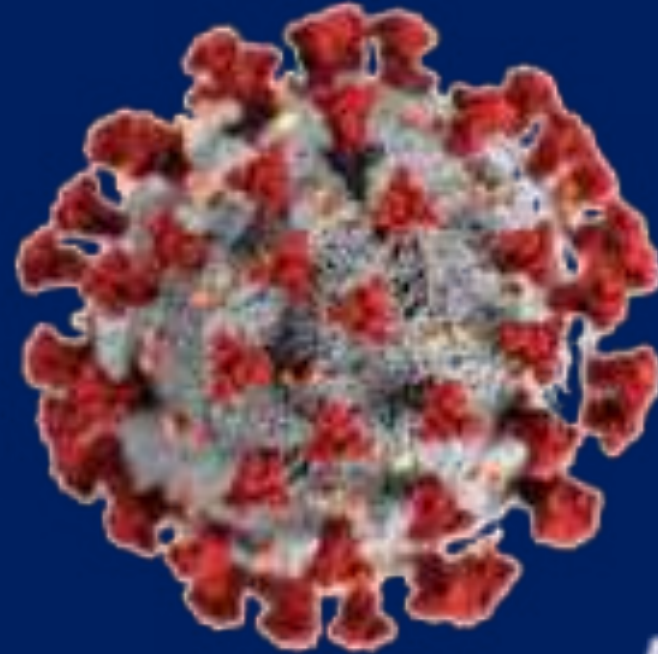


# Data

## Veracity/Validity

the truth and authenticity of the data, and what can you do with it

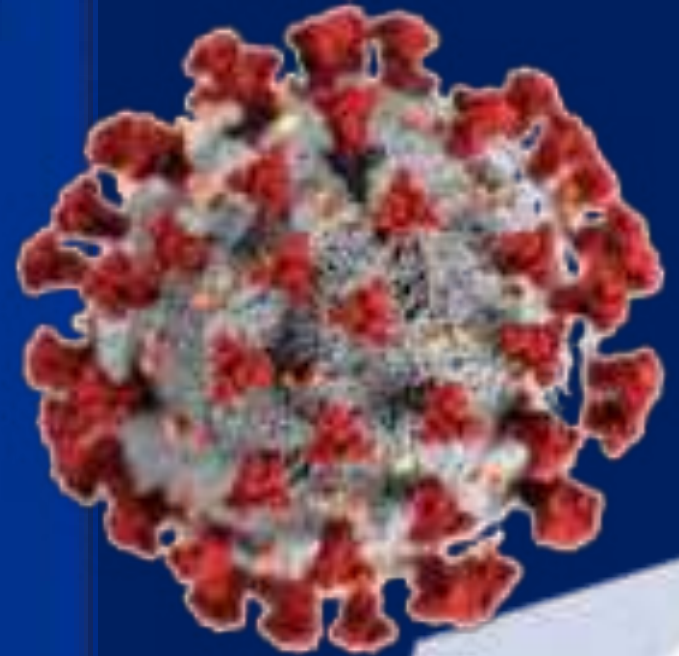
the accuracy and reliability of the data



# Data



NHS



# Data

## Variability

to what extent, and how fast, is the structure of your data changing?

And how often does the meaning or shape of your data change?

Can have an impact on the quality of data



# Data

## Visibility

degree of ease through which an enterprise can

monitor

display

analyse

data from disparate sources



# Data

## Visibility

The most important benefit is that you get **more data** from which to **make informed business decisions**



# Data

- The average person generates **1.7 MB of data per second**.
- The world has **175 zettabytes\*** of data as of 2025.
- **97.2%** of businesses are investing in big data and AI.

\*175 ZB = 70 billion human brains worth of information!





# Data

- The global big data market value is more than **\$131.4 billion** (2025) by annual revenue. This was \$56 billion in 2022.

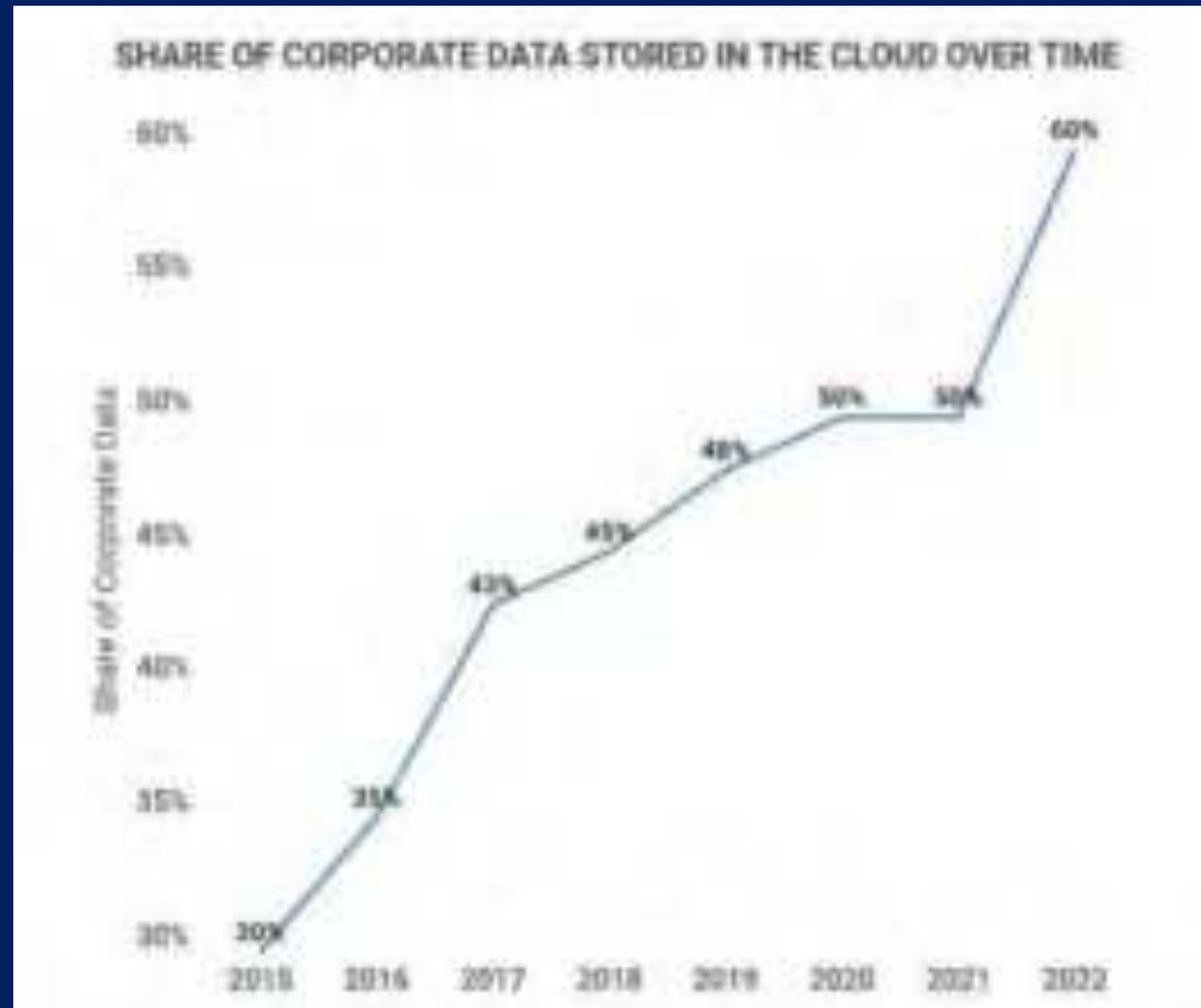


# Data

- **90%** of the world's data has been created in the **last two years**.
- The global average cost of a data breach hit an all-time high of **€4.88 million** in 2024 - up almost 10% in two years
- As of 2024, **60%** of corporate data worldwide is **stored in the cloud**. It was only 30% in 2015.



# Data



# Data

- Companies that use big data solutions increase profits by an average of **8%**.
- **24%** of executives say they'd describe their companies as data-driven.
- **97.2%** of business executives say their organisations are investing in big data and AI projects.



# Data

- The average company **doesn't use 60-73%** of its data for analytics.
- **95%** of businesses consider the need to manage unstructured data a problem they face
- Retailers that use big data fully can increase their **operating profits by 60%**.





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# Data





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# What Data do they collect about us?



# Data Collected About You

Personal Information				
Name	data collected	data collected	data collected	data collected
Username	data not collected	data not collected	data collected	data not collected
Password	data not collected	data not collected	data collected	data not collected
Phone Number	data collected	data collected	data collected	data collected
Payment Information	data collected	data collected	data collected	data collected
Address	data not collected	data not collected	data collected	data collected
Social Security Number	data not collected	data not collected	data collected	data not collected
Driver's license number	data not collected	data not collected	data collected	data not collected
Email Address	data collected	data collected	data collected	data not collected
Emails you write and receive	data collected	data not collected	data not collected	data collected
Stored photos and photos	data collected	data collected	data not collected	data not collected
Metadata of photos and files	data not collected	data collected	data not collected	data not collected
Stored documents	data collected	data not collected	data not collected	data not collected
Stored applications	data collected	data not collected	data not collected	data not collected
Website comments	data collected	data not collected	data not collected	data not collected
Contact info from devices	data not collected	data not collected	data not collected	data not collected

# Data Collected About You

Unique Identifiers				
IP address	data not collected	data not collected	data not collected	data not collected
Crash reports	data not collected	data not collected	data not collected	data not collected
System Activity	data not collected	data not collected	data not collected	data not collected
Date, time and referrer URL of requests	data not collected	data not collected	data not collected	data not collected
Data about interactions between Apps	data not collected	data not collected	data not collected	data not collected
Browser type	data not collected	data not collected	data not collected	data not collected
Device type	data not collected	data not collected	data not collected	data not collected
Application version number	data not collected	data not collected	data not collected	data not collected
Carrier name	data not collected	data not collected	data not collected	data not collected
Operating system	data not collected	data not collected	data not collected	data not collected

# Data Collected About You

Activity	G	f	a	Apple
Search Terms	Not collected	Not collected	Not collected	Not collected
Address/ Connections	Not collected	Not collected	Not collected	Not collected
Messages	Not collected	Not collected	Not collected	Not collected
Content	Not collected	Not collected	Not collected	Not collected
Items Added	Not collected	Not collected	Not collected	Not collected
Views and Interactions with Content and Ads	Not collected	Not collected	Not collected	Not collected
Views and Audio Information of Audio Features May Hear	Not collected	Not collected	Not collected	Not collected
Time, Frequency and Duration of Activity	Not collected	Not collected	Not collected	Not collected
Purchase Activity	Not collected	Not collected	Not collected	Not collected
Reviews	Not collected	Not collected	Not collected	Not collected
Apps You Communicate/ Interact With	Not collected	Not collected	Not collected	Not collected
Activity on Third Party Sites and Apps	Not collected	Not collected	Not collected	Not collected
Browsing History	Not collected	Not collected	Not collected	Not collected
Calling Party Number	Not collected	Not collected	Not collected	Not collected
Receiving Party Number	Not collected	Not collected	Not collected	Not collected
Forwarding Numbers	Not collected	Not collected	Not collected	Not collected
Times and Dates and Calls of Text	Not collected	Not collected	Not collected	Not collected
Call Duration	Not collected	Not collected	Not collected	Not collected
Routing Information	Not collected	Not collected	Not collected	Not collected
Types of Calls	Not collected	Not collected	Not collected	Not collected
Always Settings	Not collected	Not collected	Not collected	Not collected



# Data Collected About You

				
<b>Time Zone</b>	data not collected	data not collected	data not collected	data not collected
<b>GPS</b>	data collected	data not collected	data collected	data collected
<b>Send Data From Device</b>	data collected	data collected	data collected	data not collected
<b>Information About Things Near Device (Location Acc Bluetooth-enabled Devices, etc.)</b>	data collected	data not collected	data not collected	data not collected
<b>Publicly Accessible Sources</b>				
<b>Local Newspapers</b>	data collected	data not collected	data not collected	data not collected
<b>Third Party Marketing Partners</b>	data collected	data not collected	data collected	data not collected
<b>Advertisers</b>	data collected	data not collected	data collected	data not collected
<b>Credit History From Credit Bureaus</b>	data not collected	data not collected	data collected	data not collected



# Data Collected About You



***<https://adssettings.google.com>***

*Share with us what Google knows about you*



# Data



## Company Data

- Sources
- Use
- Examples



# Company Data

## Sources

- Clients
- Service Providers
- Employees





# Company Data

## Sources

Clients Data:

Record Keeping

Marketing

Security

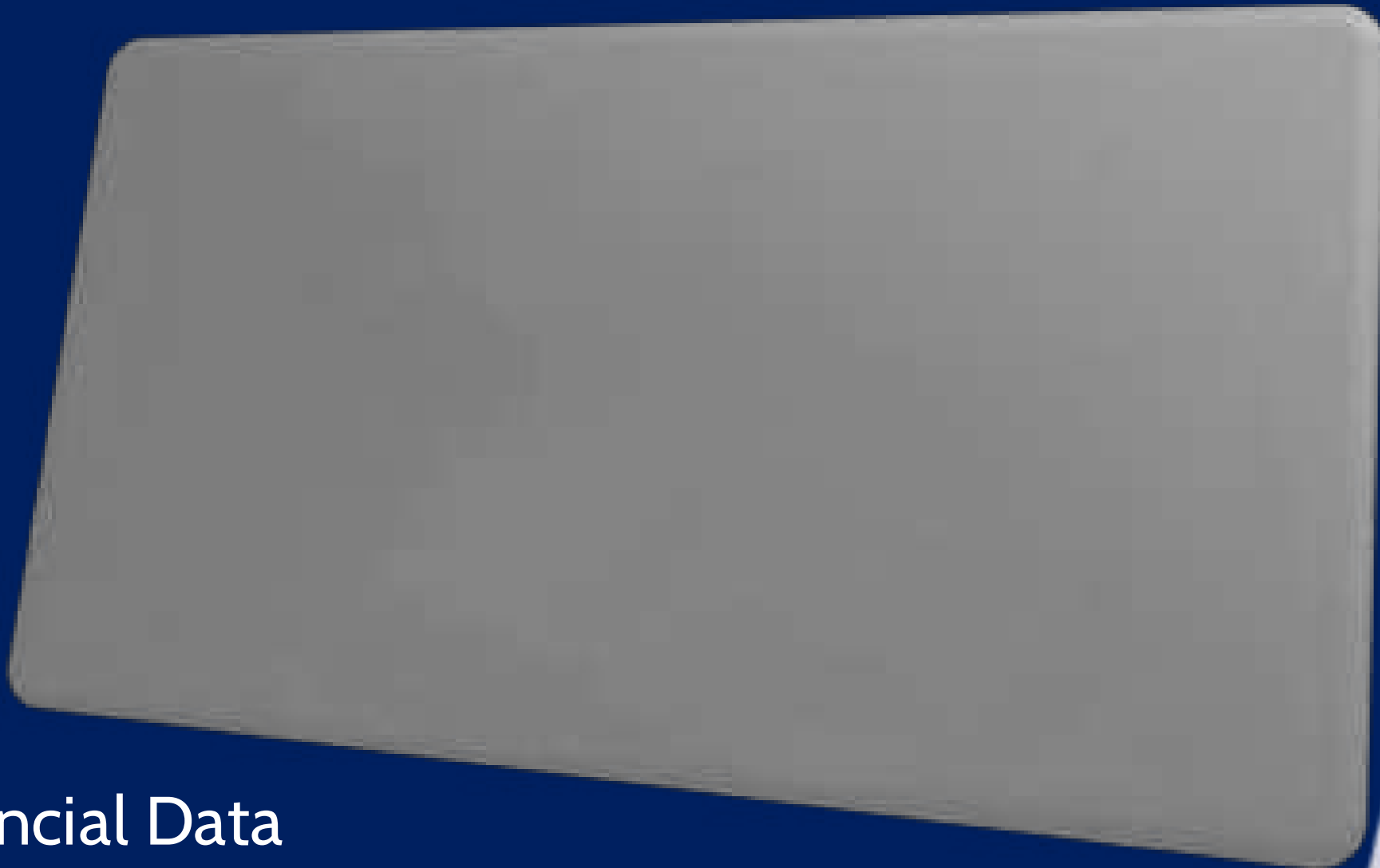
Service Providers:

Record Keeping

Security



# Company Data - Clients & Service Providers



Financial Data



# Company Data - Employment

- Personal contact details such as name, title, addresses, telephone numbers, and personal email addresses.
- Date of birth.
- Gender.
- Marital status and dependants.
- Next of kin and emergency contact information.
- National Insurance number.
- Bank account details, payroll records and tax status information.
- Salary, annual leave, pension, and benefits information.
- Start date.
- Location of employment or workplace.
- Copy of driving licence.
- Recruitment information (including copies of right to work documentation, references and other information included in a CV or cover letter or as part of the application process).
- Employment records (including job titles, work history, working hours, training records and professional memberships).
- Compensation history.
- Performance information.
- Disciplinary and grievance information.
- CCTV footage and other information obtained through electronic means such as telephone calls' recordings.
- Information about your use of our information and communications systems.
- Photographs



# Company Data - Employment



Recruitment



# Company Data - Employment



Monitoring



# Company Data - Employment



HRM



# Company Data - Marketing



Mailchimp



# Company Data - All



Security





# Company Data - All



Fleet Tracking



# Where is this data?

## Media

- Paper
- Optical
- Magnetic
- Solid State
- Network Attached Storage (NAS)
- Cloud Storage



# Where is this data?



## Types of storage media

Paper, optical, magnetic, & solid state



# Where is this data?

## Media

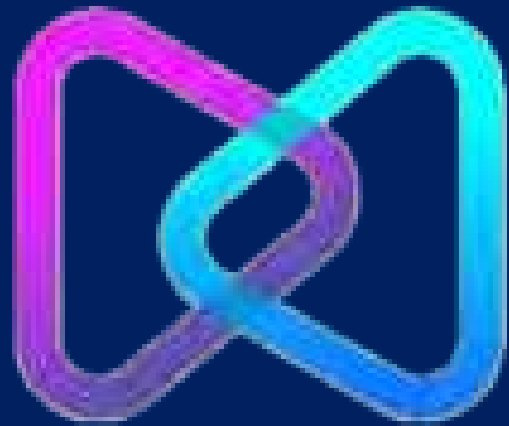
- Paper
- Optical
- Magnetic
- Solid State
- Network Attached Storage (NAS)
- Cloud Storage



# Where is this data?



# Tomorrow's company's



# Metaverse



# What is Metaverse?



# Tomorrow's company's





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