



An introduction to data science

# Data science, business, and systems theory

# Business and technology

## What is a business?

A **business entity** is an **organisation** that uses economic resources to **provide** goods or services to customers in exchange for **money** or other **goods and services**.

## Technology in business

Businesses across various sectors are rapidly **adopting technology** to **transform** their operations. This shift has accelerated **development cycles** and given rise to **disruptive business models** and heightened **competition**, highlighting the **essential role** of **technology and automation** in today's business environment.

# An overview of the legal aspects

Most people use the terms **business** and **company** interchangeably. Legally, the word **business** describes an **activity** or **project, not a legal entity**. For example, Meta is not a business; it is a company, and its business is social media services.

When a person starts their **own** business, **everything** that it is **belongs** to them. We say that the owner is **liable** for **all** things for which the business is responsible.

**Naming** a business **doesn't separate** it from its owner, so many businesses **register** as legal **entities**, aligned with corporate laws and regulations that **dictate how** it should be run.

# Types of business entities

## Sole Proprietorship

A **common** business entity because it is **easy** and **affordable** to set up. A license grants the owner **complete control** over the business, meaning no other person can make decisions for the business and its assets.

It grants the owner **unlimited liability**, which means the owner puts all of their personal assets at risk for the sake of the business.

The owner **can hire** employees that may assist in the running of the business.

## Partnership

Also **affordable** though **less easy** to set up. Here, a license means the law recognises **two or more** individuals as the **owner**.

Partners must decide their **share** of the business. The license grants **each owner unlimited liability**, meaning that each puts their assets at risk for the entire business and not only their share.

# Types of business entities

## Company

While proprietorships and partnerships are tied to their owners, **companies** function as **distinct legal entities**. This means the company itself, rather than its individuals, possesses **ownership** of the business.

This structure provides individuals with a degree of **financial safeguarding**, as they are accountable for only a predetermined portion of the company's debt – a concept known as **limited liability**.

A **private** or **proprietary** company is owned by **one or more shareholders**. A **public** company is the same, but makes its shares available for purchase on a **stock market**.

# An overview of protective legislation

Legal requirements are there primarily to **protect people**. The legal entities offer their owners **protection** in some way, but **legislation** also protects **employees**.

**Health and safety regulations** play a crucial role in ensuring that work environments are **free** from potential **harm** and **risks**, safeguarding employees' well-being.

There are also several **regulations** and **laws** in place to address working hours, leave, contracts, etc., as well as promote **equal opportunities** and **treatment**.

# Developing a good business strategy and plan

All organisations need to develop a **strategy** to guide their work. This describes the **overarching goals** of a business and the **actions** upper management will take on behalf of the owners to **meet the goals**.

With strategy as a guide, we can formulate a **business plan**, which is a **working document** that describes **how** the business plans to **implement** its **strategy**.

## Steps of a good business plan



# An overview of financial concepts

With a business plan in place, the next concept would be **finance**.

**Financial statements** are **formal documents** that include the **balance sheet**, **income statement**, and **cash flow statement**.

These documents record **how much money** a business has, **where it goes**, **where it comes from**, and **who is using it**.

The **balance sheet** keeps **track** of how much **money** a business has, and what **form** it takes.

The **income statement** (profit and loss reports) details **income** and **expenses** over **regular** periods.

The **cash flow statement** describes **how** the company **uses money** to make **more money** in ways not necessarily directly associated with its chosen business.



# An overview of marketing

**Marketing** consists of all processes involved in **understanding** and **managing** the **exchange** of goods and **services** between **customers** and **providers**.

Most marketing work involves **understanding what consumers want** and **providing business** to them, or **finding** a group of consumers that want your business.



**Successful marketing** requires a deep **alignment** between **consumer needs** and **business offerings**.

# An introduction to technology

Technology has always been vitally important to **successful businesses**, especially those technologies aimed at improving **efficiency**.

Any business that can **access** and **share information faster** than its **competitors** will have a significant **advantage**.

The utilisation of **information systems** has become important for **efficient operations**. These systems span a spectrum of functionalities, each catering to **specific organisational needs** and **levels**.

# Preparing for the meeting

For a typical organisation, there are usually **six** different types of **information systems**.

**1 Transaction Processing Systems (TPS):**  
Process routine and operational transactions, such as sales and inventory updates, at the operational level of an organisation.

**3 Knowledge Management Systems (KMS):**  
Facilitate the collection, organisation, and dissemination of knowledge, fostering better decision-making and collaboration.

**5 Decision Support Systems (DSS):** assist managers in making semi-structured and unstructured decisions by providing tools and access to data and models.

**2 Office Automation Systems (OAS):** Streamline and automate everyday office tasks, such as document management, communication, and scheduling, to enhance office efficiency.

**4 Management Information Systems (MIS):**  
Gather, analyse, and present summarised information to middle managers, aiding in tactical decision-making and planning.

**6 Executive Support Systems (ESS):** provide insights to senior executives to support strategic decisions, focusing on trends and external factors impacting the organisation.

# How to provide and respond to feedback

The ability to **compile, provide, and respond** to feedback is vital when it comes to working with other people in a team, family, or community – **regardless** of the **objective** of that group.

In order to work effectively, people need to **know, understand, and acknowledge** how their behaviours and attitudes **impact** those around them.

# Feedback considerations

When providing feedback to people, the feedback provider should be aware of the **context**, **situation**, and **details** of the actions that are being commented on. The following should be taken into account:

## Focus on a particular behaviour

This should be **specific** rather than general.

## Minimise blame statements

Focusing on the **impact of an action** rather than blame can avoid emotional responses.

## Not character associated

**Feedback** should be **behaviour or action-related**, not a criticism of someone's personality.

## Ensure understanding

The provider should make sure that the recipient **understands the feedback** properly.

## Outcome orientated

Focus on the **details of what happened**, i.e. awareness of the outcome or impact is important.

## Well timed

Feedback is most effective when there is a **short time between behaviour and feedback**.

# Appropriate work behaviour

All places of work have a **different work culture** – a different atmosphere. This can be passed down from management in terms of **company values** as well as the company's **code of conduct**.

All companies have a **code of conduct** which defines the employees' **day-to-day behaviour**. Think of the ExploreAI honour code as our **code of conduct**.

This reflects our **culture, values**, and **what is expected** of us.

## Appropriate work behaviour guidelines

- Put in the **effort**.
- Be **present**.
- Use the **resources** made available to us.
- **Share** our **knowledge** for the benefit of our fellow students.
- **Communicate** openly and honestly with our teammates and supervisor.
- Stick to **deadlines**.
- Take our **teamwork** seriously.