



INTRODUCTION TO BUSINESS ANALYTICS AND STATISTICS

Data Analysis

- The success or failure of every business depends on the **decisions made by the people within** that **business**.
- The quality of decisions **depends significantly on the quality of information available** to the decision-maker.
- Information in a business is often the outcome of **data collection, analysis, interpretation and reporting**.

Data vs Information

- **Data** is part of the information, but data **is NOT information**.
- To be useful, **data must be gathered, processed, stored, manipulated, analysed and tested** using valid statistical methods.
- The **outcome of data analysis is reported as information** or business intelligence that **decision-makers can use**.

Characteristics of a Good Sample

- A sample should be:
- **Unbiased**
 - **Representative**
- The observations in the sample should be:
- **Randomly chosen**
 - **Independent of each other**

Types of Statistics

Descriptive Statistics

Explore what is contained in a data set by drawing graphs, creating tables of data summaries.

Inferential Statistics

drawing conclusions about the population based on a data sample taken from the population.

Data Analytics

examines data sets to uncover hidden patterns and trends. For example, this can then be used to discover sales trends, predict customer loyalty, and develop smarter marketing campaigns.

Types of Data 1

QUALITATIVE **VS** QUANTITATIVE DATA

Qualitative/Categorical/Non-Numerical Data

Quantitative/Numerical Data

VS

Nominal

Types of products, customer segments

Discrete

Number of units sold, number of employees

Ordinal

Customer satisfaction ratings, employee performance levels

Continuous

Sales revenue, temperature, or time taken to complete a task

Types of Data 2

CROSS-SECTIONAL DATA **VS** TIME SERIES

Cross-Sectional Data

Data collected at a fixed point in time across a section. Businesses often conduct surveys to gauge consumer sentiment about a new product. This captures data at a single point in time.

Time-Series Data

Data collected over time. Businesses collect and track their sales data on a daily, weekly, monthly or quarterly basis, allowing them to see patterns over time.

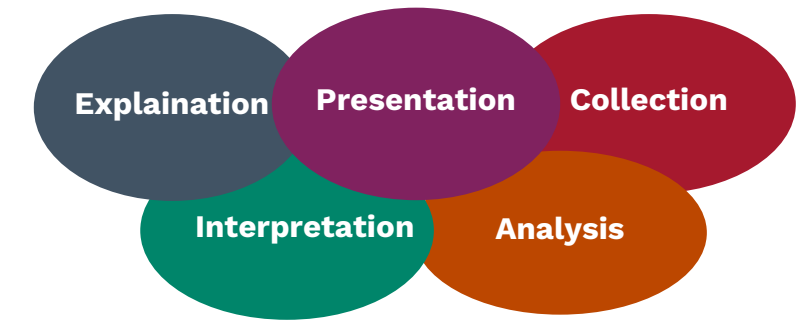
Statistics

VS

Business Analytics

- **Data-driven approach** to decision-making
- **Uses quantitative analysis**
- **Cost-Benefit Principle:** Every proposed exercise in **data gathering and analysis** should first be **assessed to ensure** its potential **benefits outweigh** its potential **costs**.
- **Business intelligence:** an **outcome of data analysis**.

It is a **mathematical science** concerned with data:



It is the **foundation of business analytics**

Data vs Variable

- **Data:** Raw facts and figures gathered for analysis, forming the foundation for insights and decision-making.
- **Variable:** A measurable characteristic that can change, such as age, height, or grade level in a student's study

Population vs Sample

- **Population:** The complete set of individuals or instances that meet specific criteria and are the focus of a study.
- **Sample:** A smaller, representative subset of the population chosen for analysis, used to draw meaningful conclusions about the whole group

Census

- A census is a systematic collection of data from every member of a population, providing comprehensive information for complete coverage. It is commonly conducted by governments or organisations to inform policy, planning, and decision-making.