

Data Analytics

Concepts & Tools

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Introduction

Data Around Us

You Use Data Every Day

Before having your morning tea/coffee or stepping into the class, you'd already used data analytics multiple times.

Probably, you:

- Checked WhatsApp to confirm if class was happening
- Opened Maps to see the best route and travel time
- Glanced at weather to decide what to wear
- Scrolled through social media - algorithms chose what you saw



Data Analytics

What, How, and Why

Data Analytics is turning **raw information** into **actionable business insights**.

We follow a **systematic** approach:

- Collect relevant data
- Clean and organize it
- Apply analytical techniques
- Find patterns and trends
- Draw meaningful conclusions

Gut feelings are **not enough** anymore

- Markets change too fast
- Competition is too fierce
- Resources are too valuable to waste



Types of Analytics

Types of Analytics

Four Levels of Insight

- Descriptive Analytics
- Diagnostic Analytics
- Predictive Analytics
- Prescriptive Analytics

Types of Analytics

Four Levels of Insight

Descriptive Analytics

What happened?

Shows historical data and trends

Example: “Sales were Rs 70 lakhs last month”

Types of Analytics

Four Levels of Insight

Diagnostic Analytics

Why did it happen?

Explain the reasons behind the numbers

Example: “Sales increased because of festival season timing”

Types of Analytics

Four Levels of Insight

Predictive Analytics

What will happen?

Forecasts future outcomes based on patterns

Example: “Sales will likely increase 20% next month”

Types of Analytics

Four Levels of Insight

Prescriptive Analytics

What should we do?

Recommends specific action(s) to take

Example: “Increase inventory by 25% and run targeted ads”

Key Concepts

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The Prep to Viz Path

- **Data Preparation** (70% of the work)
- **Analysis** (20% of the work)
- **Visualization** (10% of the work)

Key Concepts

The Prep to Viz Path

Data Preparation

- Cleaning: Remove errors, duplicates, inconsistencies
- Organizing: Structure data properly
- Validating: Ensure accuracy and completeness

Key Concepts

The Prep to Viz Path

Analysis

- Statistical calculations
- Pattern identification
- Trend Analysis
- Comparisons and correlations

Key Concepts

The Prep to Viz Path

Visualization

- Choosing suitable charts and graphs
- Dashboards
- Reports
- Presentations

Tools

Tools

Our Analytics Arsenal

- **Excel**
 - Great for small datasets, quick analysis, prototyping
- **SQL**
 - Perfect for large datasets, multiple data sources
- **Power BI**
 - Interactive dashboards, sharing insights, rapid report prototyping
- **Python**
 - Unlimited flexibility, programmatic analysis, automation, simple to complex analysis support

Q&A