



# Introduction to Data Analytics

Making Sense of Data for Better Decisions



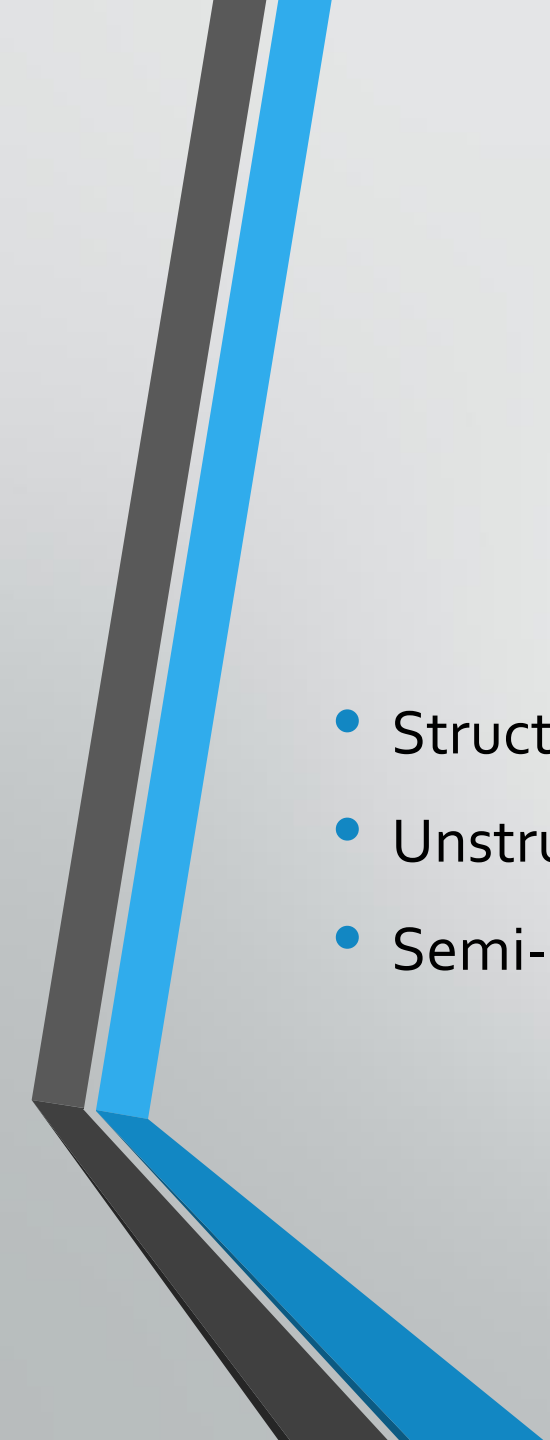
# What is Data Analytics?

- Data Analytics involves examining data to uncover patterns, trends, and insights. Think of it as being a detective for numbers, trying to understand what the data is 'saying'. It helps organizations make informed decisions based on evidence, not guesses.



# Why is Data Analytics Important?

- Improves decision-making with data-driven insights.
- Helps businesses identify opportunities and risks.
- Enhances customer satisfaction by understanding their needs.



# Types of Data

- Structured Data: Organized, like spreadsheets.
- Unstructured Data: Free-form, like text or videos.
- Semi-Structured Data: Mix of both, like JSON files.



# Types of Data Analytics

- Descriptive Analytics: What happened? (e.g., sales reports).
- Diagnostic Analytics: Why did it happen? (e.g., root cause analysis).
- Predictive Analytics: What will happen? (e.g., forecasting).
- Prescriptive Analytics: What should we do? (e.g., optimization models).



# The Data Analytics Process

- Collect: Gather relevant data.
- Clean: Remove errors and inconsistencies.
- Analyze: Apply statistical and computational techniques.
- Visualize: Present findings through charts and dashboards.



# Data Collection Methods

- Surveys and questionnaires.
- Transactional records.
- Social media and web scraping.
- Sensors and IoT devices.

# The Importance of Data Cleaning

Messy data leads to inaccurate analysis. Cleaning involves:

- 1. Removing duplicates.
- 2. Handling missing values.
- 3. Ensuring consistency in formatting.



# Data Visualization

- Visualizations make complex data understandable. Examples include:
- 1. Bar charts for comparisons.
- 2. Line charts for trends.
- 3. Pie charts for proportions.
- 4. Dashboards for interactive exploration.

# Tools for Data Analytics

Popular tools include:

- Excel: Great for small datasets.
- Power BI: Interactive dashboards.
- Python/R: Advanced statistical analysis.
- SQL: Querying and managing databases.

# Real-life Example: Supermarket Sales

Imagine a supermarket analyzing its sales data to identify:

- Which products are most popular?
- Which days have the highest sales?
- How discounts affect sales trends?



# Ethical Considerations in Data Analytics

- Protect customer privacy.
- Avoid biased data interpretations.
- Ensure data security.



# Conclusion

- Data analytics is transforming the way we understand the world. By embracing analytics, we can uncover insights that drive better decisions.