



B.Com Honours

Semester II

Calicut University

Data Analytics for Business

Course Code: COM2MN109 • Module 3 Notes

1. Types of Analytics: From Descriptive to Prescriptive

Organizations use data analytics to solve different business problems, ranging from understanding past performance to determining optimal future actions. This module covers the DIKW pyramid, the four primary types of analytics (Descriptive, Diagnostic, Predictive, Prescriptive), Big Data analytics, and practical business applications.

The DIKW Pyramid (Data vs. Information)

- **Data:** Raw, unorganized facts, figures, and symbols (e.g., a list of daily transaction amounts: 100, 250, 400).
- **Information:** Structured, contextualized data that answers "who", "what", "where" questions (e.g., daily sales averaged ₹250).
- **Knowledge:** Understanding how to use information to make decisions (e.g., sales drop every Tuesday).
- **Wisdom:** The synthesis of knowledge and experience to guide strategic policies.

The Four Types of Analytics

Descriptive & Diagnostic (Looking Back)

- **Descriptive Analytics:** Answering "what happened" by summarizing historical data (e.g., sales dashboards, monthly profit sheets).
- **Diagnostic Analytics:** Answering "why did it happen" using drill-down and data discovery techniques (e.g., sales fell because of a competitor's discount campaign).

Predictive & Prescriptive (Looking Forward)

- **Predictive Analytics:** Answering "what is likely to happen" using statistical models, trends, and machine learning (e.g., forecasting next month's sales).
- **Prescriptive Analytics:** Answering "how can we make it happen" by recommending optimal courses of action using optimization algorithms (e.g., suggesting dynamic pricing adjustments).

Big Data Analytics

Big Data refers to datasets whose size and complexity exceed the storage and processing capabilities of traditional relational databases. It is defined by the **4 V's**:

- **Volume:** The sheer quantity of data generated (terabytes to petabytes).
- **Velocity:** The speed at which new data is generated and needs to be processed (real-time credit card fraud detection).
- **Variety:** The different formats of data (structured SQL, semi-structured JSON, unstructured video).
- **Veracity:** The trustworthiness and quality of the data.

Business Applications of Data Analytics

Firms apply analytics across different functional areas:

- **Marketing Analytics:** Customer churn prediction, market basket analysis (identifying which products are bought together).
- **Financial Analytics:** Credit scoring models, fraud detection algorithms.
- **Operations Analytics:** Predictive maintenance for factory machinery, delivery route optimization.

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