

# Assignment - I

Introduction to Data - Driven Decisions Making

Programme :- BCA (AI & DS) Hons.

Semester :- I

Session :- 2025-26

Course :- Foundations of Data - Driven Decision  
Making

Section :- 'C'

Submitted by :- OM Mathur

Roll No. :- 2501201026

### Task - 1

#### Real-World Scenario of Data-Driven Decisions

In healthcare, decisions are increasingly data-driven to improve patient care and operational efficiency. For instant hospitals gather vast amounts of patient data - including electronic health records, lab results, imaging, and genetic profiles. This data is analyzed using machine learning to personalize treatments, predict disease progression, and optimize resources use. Such data-driven decisions lead to earlier disease detection, more precise treatments and better patient outcomes.

Healthcare providers also use this data for operational decisions like staff scheduling and inventory management, enhancing overall service quality.

### Task - 2

#### Descriptive, Predictive and Prescriptive Models

##### # Descriptive Model :-

- Purpose: Understands and explains what has happened in the past.

- Focus : Summarizes historical data gathered from data aggregation and mining techniques.
- Techniques : Use of tools like dashboards, reports, data visualization (charts, graphs).
- Outcome : Provides insight into past performance. answers questions like 'What happened' and "How did it Happen?" .
- Approach : Reactive - helps understand events after they occur.
- Example : Annual sales report showing past revenue and customer activity.
- Tools : Excel, Tableau, Power BI.
- Cases : Monitoring business performance, understanding customer behavior, summarizing operational data.

## # Predictive Model :-

- Purpose : Forecasts what might happen in the future based on patterns in historical data.
- Focus : Uses statistical models and machine learning to predict outcomes and trends.

- Data Used: Historical data plus additional contextual or real-time data to improve prediction accuracy.
- Techniques: Regression analysis, classification, time-series forecasting, data mining.
- Outcome: Provides probabilistic forecasts and scenarios; answers "What could happen?" or "What is likely to happen?".
- Approach: Proactive - helps prepare for future possibilities.
- Example: Predicting which customers are likely to churn based on past behavior.
- Tools: R, Python, SAS.
- Cases: Demand forecasting, risk assessment, customer segmentation.

#

### Prescriptive Model :-

- Purpose: Recommends the best course of action to optimize outcomes.
- Focus: Combines data, algorithms, business rules and optimization to simulate and evaluate possible decisions.

- Data Used : Historical data, predicted scenarios, business constraints , and objectives.
- Techniques : Optimization algorithms, simulation, heuristics.
- Outcome : Provides actionable recommendations and decisions options , answers - "What should we do"
- Approach : Proactive - helps decide the best actions to take for desired results.
- Example : Suggesting optimal inventory levels or marketing strategies to maximize profit.
- Tools : Gurobi, IBM ILOG CPLEX, advanced decision support systems.
- Cases : Resource allocation , supply chain optimization, personalized medicine guidance.

In Summary, descriptive helps understand past, predictive analytics anticipates the future, and prescriptive analytics suggest the best decisions to optimize results, with increasing complexity and value towards actionable insights.

### Task - 3

#### # Internal Data Sources

Internal Data Sources refer to information generated within an organization, derived from its own activities, transactions, processes or systems.

These sources reflect the direct experience and operations of the company and are usually proprietary.

Internal data support decisions about sales, marketing, finance, operations and human resources.

Examples include sales reports, inventory records, employee metrics, production logs, and CRM data.

#### # External Data Sources

External data sources are information gathered from outside the organization. These sources provide context, benchmarks, competitor intelligence, and broader market trends. This data can come from third-party providers, government databases, social media, market research or competitor analysis.

External data helps a company understand external factors affecting its business, such as market trends, competitor behavior and economic conditions.

## # Internal Data Sources of Amazon

1. Sales Transactions Data: Records of product sales, order quantities, time stamps and payment details collected from Amazon's e-commerce platform.
2. Customer Data and Profiles: information from user accounts including from user accounts including purchase history, browsing behavior, wish lists and preferences.
3. Inventory and Supply Chain Data: Data on stock levels, warehouse logistics, supplier deliveries and fulfillment center operations.
4. Advertising and Marketing Data: Campaign performance metrics, ad clicks, impressions, conversion rates collected from Amazon's advertising platforms.
5. Employee and Workplace Data: HR databases containing employee performance, attendance, payroll and training records.

## # External Data Sources of Amazon

1. Market Trends and Competition Data: Industry reports, competitor pricing, and product availability insights from market research

firms and public sources.

## 2. Customer Reviews and Social Media Sentiment:

Reviews and ratings from Amazon customers as well as sentiment and feedback from social media platform.

## 3. Supplier and Vendor Data:

Third-party suppliers' catalogues, pricing and shipment tracking information.

## 4. Economic and Demographic Data:

Government statistics, census data, and economic indicators used for regional market analysis and demand forecasting.

## 5. Third-party Analytics and Advertising Platform:

Insights and data from platforms like Google Analytics, Facebook Ads used for broader marketing strategy evaluation.

## Task - 4

After Adopting a data-driven approach significantly improves decision quality in both daily life and business through multiple key dimensions:

## 1. Enhance Confidence and Objectivity:

Data-driven decisions are backed by factual evidence and numerical insights, reducing reliance on intuition or gut feeling. This objectivity instills confidence in choices, promotes consistency and decreases biases stemming from external influences or personal assumptions. In business, this confidence enables full support and commitment to strategies and goals, knowing they are based on sound evidence.

## 2. Promotes Proactive Behavior:

With ongoing data collections and analysis, individuals and organizations shift from reactive to proactive decision making. Early identification of trends, risks or opportunities becomes possible, allowing faster and more informed responses. For example, businesses can detect market shifts early, and individuals can foresee financial challenges or health issues before they worsen.

## 3. Improves Efficiency and Reduces Costs:

Data-driven insights expose inefficiencies, bottlenecks, or waste in processes. This allows better resource allocation and streamlined operations, leading to cost savings. In business, this means optimizing supply chains, reducing inventory excess or lowering customer acquisition costs. In daily life, it can mean smarter budgeting or time management.

#### 4. Increases Accountability and Transparency:

Shared data insights across teams create a culture of accountability where everyone understands how their actions impact larger goals. This transparency helps recognize performance gaps early and rewards successful practices. It encourages collaborative efforts towards improvement and shared responsibility in achieving outcomes.

#### 5. Enables Continuous Improvement and Innovation:

Data-backed decisions provide measurable feedback loops, enabling ongoing evaluation of results against objectives. This fuels continuous learning and refinement, fostering innovation and adaptation in dynamic environments. Whether it is improving customer service or adjusting personal habits, data helps track progress and identify areas for growth.