DATA ANALYTICS

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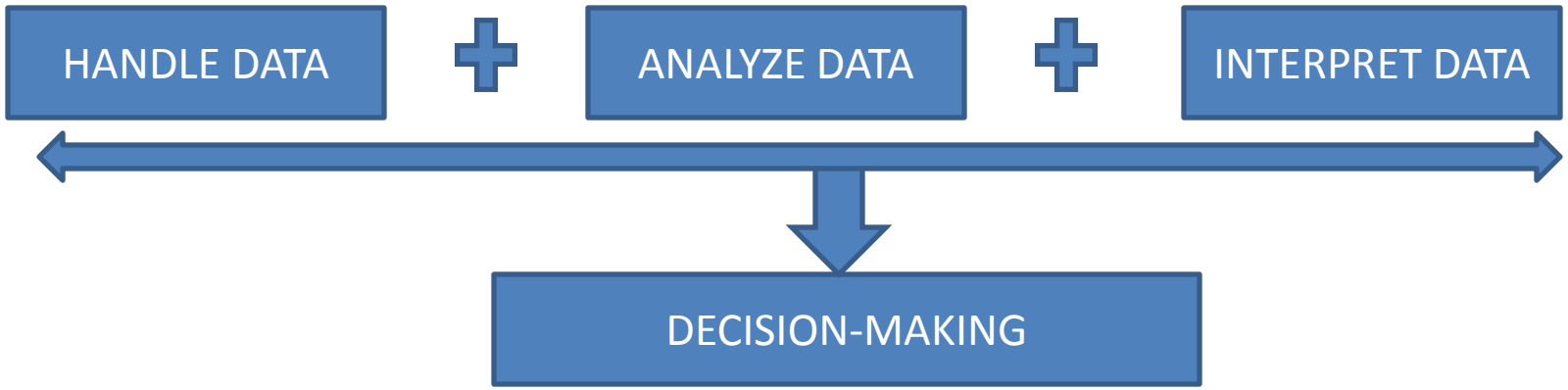
Class – MBA III Sem. – Business Analytics

DATA ANALYTICS

Definitions:

It is a process and practice of analyzing data to answer questions, extract insights, and identify trends.

DATA ANALYSIS can be defined as a process of cleaning, transforming and modeling data to discover useful information for business decision-making.



PURPOSE OF DATA ANALYTICS

- To extract useful information from data
- To take decision based upon the data analysis.

The purpose of data analysis is to present the data in a form that makes sense to the people.

ADVANTAGES OF DATA ANALYTICS

- Improved Decision-Making
- More Efficient Operations
- Better Customer Services

USES/APPLICATION OF DATA ANALYTICS

- Risk Management
- Budgeting & Forecasting
- Marketing & Sales
- Product Development

TYPES OF DATA ANALYTICS

Also known as Levels of Data Analytics.

1. **DESCRIPTIVE DATA ANALYTICS:**

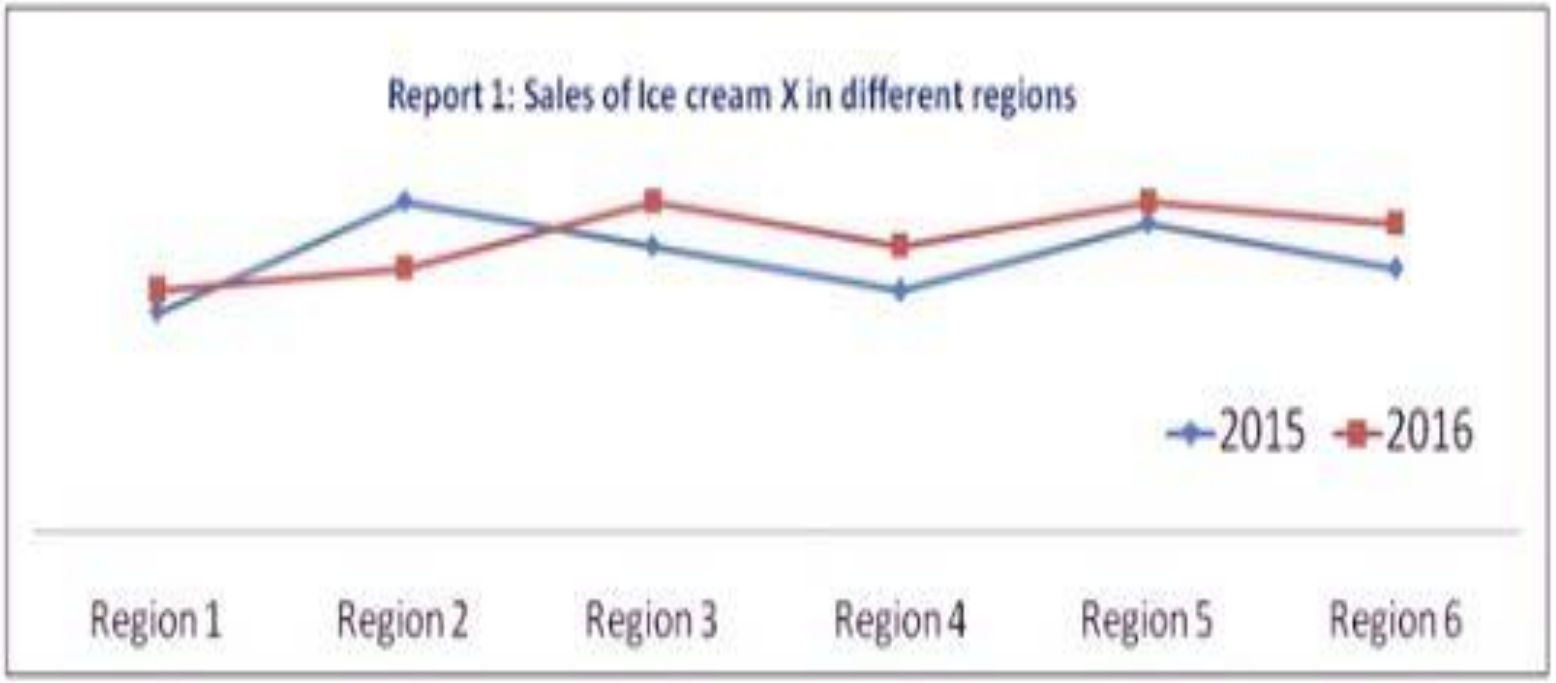
   It looks at data to examine, understand, and describe something that's already happened.

It answer:

What is happening in your business?

It provides insight into past events

What is happening?



TYPES OF DATA ANALYTICS

2. DIAGNOSTIC ANALYTICS:

It goes deeper than descriptive analytics by seeking to understand "why" behind what happened.

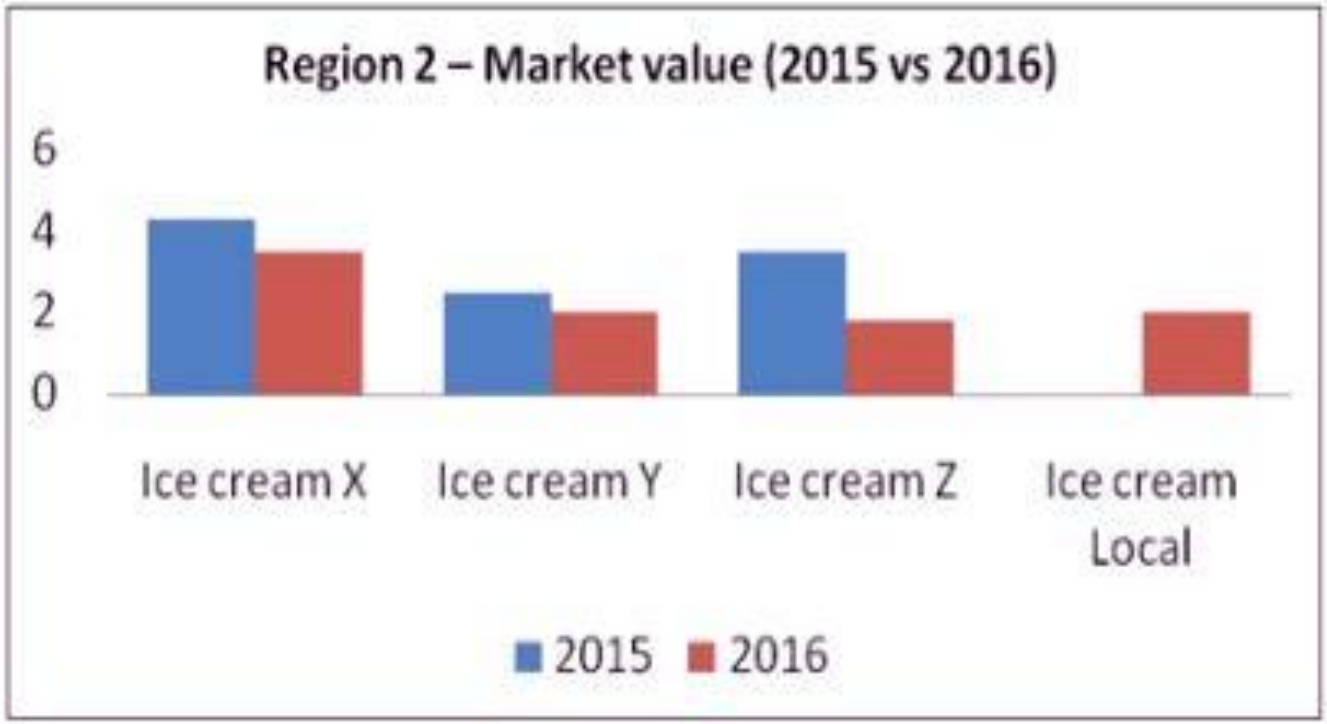
It explains the root cause behind the outcome of descriptive analytics.

It answer:

Why that happened in your business?

It finds the cause of the outcome.

Why is it happening?



TYPES OF DATA ANALYTICS

3. **PREDICTIVE ANALYTICS:**

   It relies on historical data, past trends and assumptions.

It answers:

What will happen in the future?

It predicts the future outcome.

What is likely to happen?

Regression Equation for Region 2

Sales = 5.6 + 1.2 * Advertisement Exp + 0.5 * Discount

TYPES OF DATA ANALYTICS

4. PRESCRIPTIVE ANALYTICS:

It identifies specific actions an individual / organization should take to reach future targets or goals.

It advise users on possible outcomes and what should they do to maximize their key business matrics.

It Answers:

What should be done? **Or** What actions to be taken to achieve predicted results?

It analyzes past decisions and events to estimate the likelihood of different outcomes.

What is the best course of action?

1. Increase the Advertising Expense by 10%
2. Give a 5% Discount for 2 months

TYPES OF DATA ANALYTICS

Descriptive Analytics

"What Happened"

Provides insights into Past events

Diagnostic Analytics

"Why Did it Happen"

Take the insights from descriptive analytics to dig deeper to find the cause of the outcome

Predictive Analytics

"What Will Happen Next"

Leverages historical data and trends to predict the future outcome

Prescriptive Analytics

"What Should Be Done"

Analyzes past decisions and events to estimate the likelihood of different outcomes

Examples

- **Descriptive Analytics – What Happened?**

  It is primarily involved in finding all the statistics that describes the data.

  How many buyers brought Air Conditioners in the month of December?

- **Diagnostics/Discovery Analytics – Why did it Happen?**

  Why there is an increase/ decrease in the sales of Air Conditioners in the month of September?

- **Predictive Analytics – What will happen next?**

  What will be the sales improvement next year?

- **Prescriptive Analytics – What should be done about it?**

  How much amount of material should be procured to increase the production?

PHASES OF DATA ANALYTICS

Also known as data analytics lifecycle

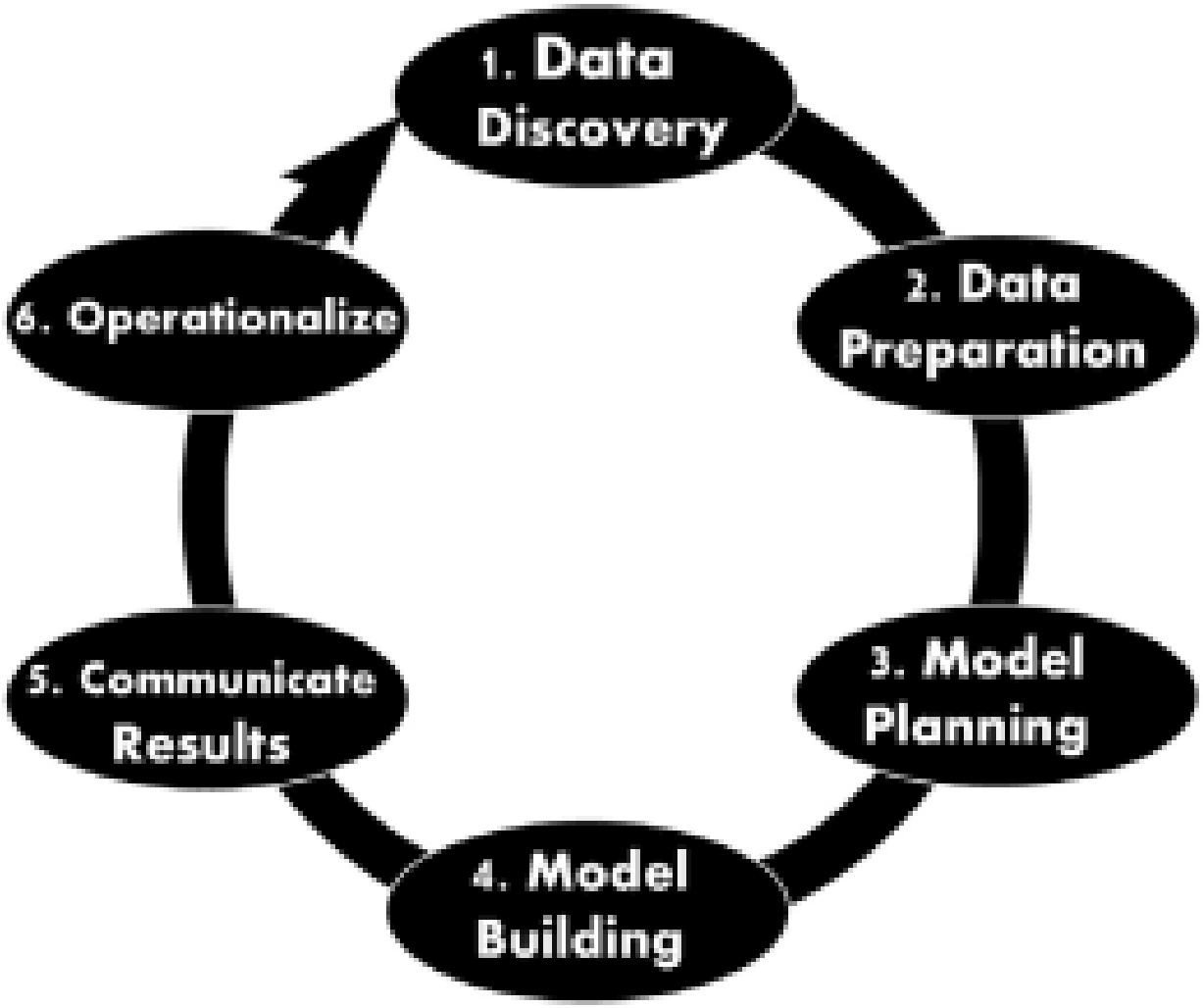
Data analytics lifecycle defines analytics process, best practices spanning discovery to project completion.

The lifecycle draws from established methods in the realm of data analytics and decision science.

There are six phases of data analytics:

1. Data Discovery
2. Data Preparation
3. Planning of data models
4. Building of data models
5. Communications of results
6. Operationalize.

PHASES OF DATA ANALYTICS



1. Data Discovery

- Learn the business domain/problem (Domain Knowledge)
- Study relevant history (Whether similar problems occurred in the past)
- Assess the resources available (People, Time, Technology & Data)
- Framing of problem

2. Data Preparation

- Pre-process Data
- Execute Extract, Load and Transform (ELT) or Extract, Transform and Load (ETL)
- Data Conditioning (mtr, cm, mm etc. – convert in same unit)
- Data Cleaning
- Data Selection

3. Model Planning

- Plan the methods, techniques and workflow to follow for the model building phase.

- Explore data to learn about the relationships between variables

- Select key variables and most suitable models.

Clustering, Association rules, Regression and Classification.

SELECTION OF VARIABLES, METHODS & TECHNIQUES

4. Model Building

- Develop data Set for testing, training and production purposes.
- Execute Model based on Model planning phase
- Fast hardware (Additional Hardware or tools required for processing) and parallel processing

5. Communications of results

- Success or Failure based on the criteria developed in phase 1.

- Identify key findings, business values and summarized narrative to stakeholders

6. Operationalize

- Final report & briefing

- Submit/ Deliver Codes and Technical documents

May run a pilot project to implement the model in a production environment.

QUALITY OF DATA

It refers to the state of qualitative or quantitative pieces of information.

Data quality is a measure of the condition of data based on factors such as

- Accuracy
- Completeness
- Consistency
- Reliability

QUALITY OF DATA

Data is generally considered high quality if it is fit for its intended uses in operations, decision making and planning.