Assignment - 1

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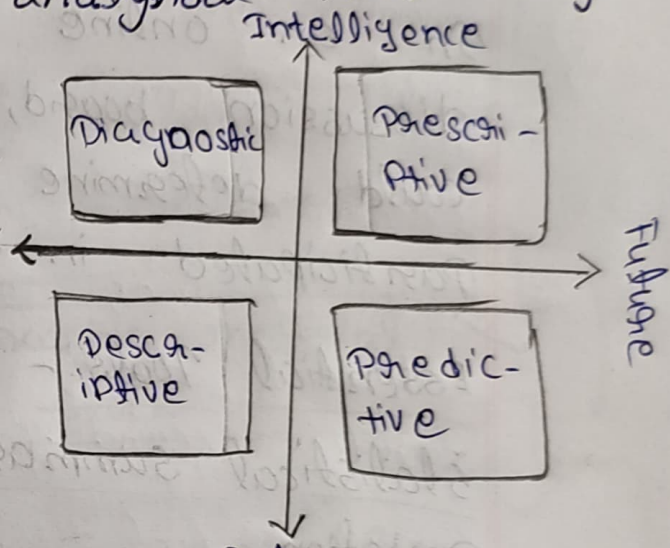
1.) Explain the types of data analytics.

Analytics can be classified into four levels which help the organizations to become mature in terms of analytical proficiency.

(i) Descriptive Analytics
(ii) Diagnostic Analytics
(iii) Predictive Analytics
(iv) Prescriptive Analytics



i) Descriptive Analytics:-

-> This is the simplest form of analytics, it summarizes an organization's existing data to understand what has happened in the past or is happening currently. It emphasizes "what is going on in the business".

-> It is one of the most widely used analytical tool favored by marketing, finance, sales, and operations teams, as it efficiently looks into past data and provides an analysis of the changes by comparing patterns and trends.

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-> Descriptive analytics answers the question, "what happened ? In the past".

For example:-

In an online learning course with a discussion board, descriptive analytics could determine how many students participated in the discussion.

Essential Tools:-

statistical summary:- mean, median, standard Deviation

z-score:- in terms of standard Deviation

coefficient of variance:-

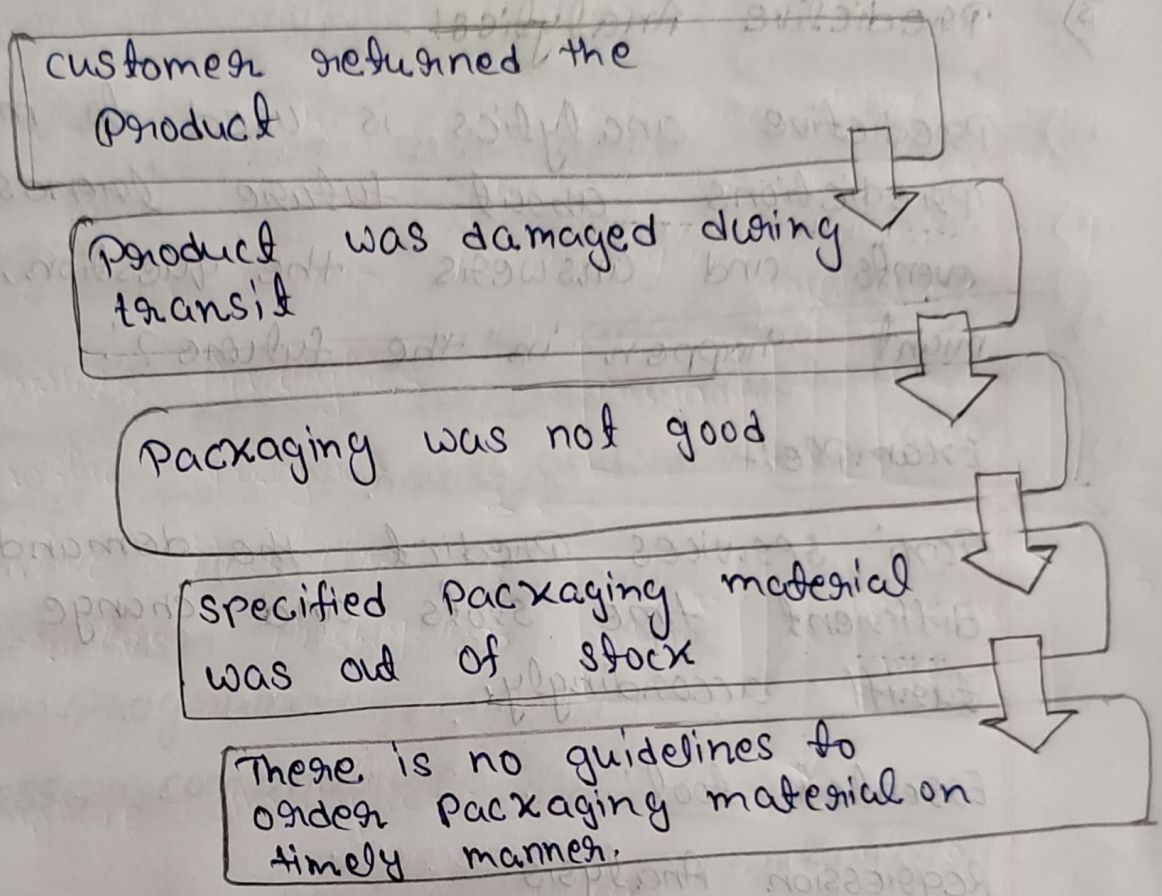
It is a ratio where we divide standard deviation with mean.

Interquartile Range:- measure to gauge the variation in the dataset.

2) Diagnostic Analytics:-

-> Diagnostic analytics addresses the next logical question, "Why did this happen"?

-> Diagnostic analytics provides "Why did it happen in my business".



Example:-
The Product return rate was very high during last month, and it found that out of total return items more than 60% of Products were supplied by two vendors only, where the vend Provided the wrong specification about products.

Essential tools:-

- correlation Analysis
- 5 why Analysis
- cause and Effect Analysis

3) Predictive Analytics:-

Predictive analytics is used to make predictions about future trends or events and answers the question, "what might happen in the future?".

Example:-

Taxi services predict the demand during different time slots and change their tariff accordingly.

Essential tool:-

Regression Analysis
Logistic Regression
Decision Tree
clustering Techniques
Random Forest.

4) Prescriptive Analytics:-

-> Finally, Prescriptive analytics answer the question, "what should we do next?"

-> Prescriptive analytics solves the complex business problem

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-> Perspective analytics can be applied once we have sound business knowledge from descriptive and predictive analytics.

Example:-

Banks use prescriptive analytics to identify investment options for their customers to maximize their returns and minimize risk.

Important Tools:-

Linear Programming, Analytical Hierarchy Process, combinational optimization.

2) Explain the Applications of Analytics in Business.

There are different Applications of Analytics in Business which are:-

(i) Customer Segmentation

(ii) Predictive Analytics

(iii) Supply Chain optimization

(iv) Fraud Detection

(v) Market Basket Analysis

vi) Churn Analysis

vii) A/B Testing

viii) Employee Performance Analytics

ix) Quality control and process Improvement

x) sentiment Analysis.

(i) Customer segmentation:-

customer segmentation is a vital business analytics application that helps companies group their customers based on shared characteristics such as demographics, buying behavior, and preferences.

(ii) Predictive Analytics:-

Predictive analytics leverages historical and real-time data to forecast future trends and events. such as Predicting stock prices, patient outcomes, and product demand.

(iii) Supply chain optimization:-

Business utilize analytics to optimize their supply chains by analyzing data related to inventory levels, supplier performance, transportation logistics.

iv) Fraud Detection:-

Fraud detection analytics employs advanced algorithms and machine learning models to identify and prevent fraudulent activities, such as credit card fraud.

v) Market Basket Analysis:-

Market Basket analysis involves examining customer purchase history to discover patterns in product co-purchases.

vi) Churn Analysis:-

Churn analysis focuses on identifying and reducing customer churn, which is the rate at which customers stop using a company's products or services.

vii) A/B Testing:-

A/B testing is a fundamental analytics applications for optimizing digital marketing compaigns and website performance.

viii) Employee Performance Analytics:-

Employee performance analytics helps organizations evaluate the productivity and

engagement of their workforce. By analyzing data on key performance indicators (KPIs), attendance, and employee feedback.

ix) **Quality control and process Improvement:-**

In manufacturing and production industries, analytics is employed to monitor product quality, detect defects, and optimize production processes.

x) **sentiment Analysis:-**

sentiment Analysis, also known as opinion mining, uses natural language processing and machine learning techniques to assess public sentiment and opinions from sources like social media, customer reviews.