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ASSIGNMENT (CAI)

NAME: SHARVYA SINGH SKINER

REGNO: RA2111032010006

SECTION: T2

BRANCH: CSE IOT

BUSINESS ANALYTICS AND BUSINESS INTELLIGENCE

Introduction:

Business Analytics (BA) & Business Intelligence (BI) are critical tools in modern business decision-making. While they are often used interchangeably, they serve different purposes.

Business Intelligence (BI):

BI involves the collection, integration, analysis & presentation of business information. It provides historical, current & predictive views of business operations.

Key Features of BI:

(1) Data Warehousing:

consolidates data from different sources.

(2) Reporting:

Generate regular reports on business performance.

(3) Dashboards:

Visual representations of key metrics.

(4) Data Mining:

Discovers patterns & relationships in data.

Scenario Example: (Retail Chain)

A retail chain uses BI tools to monitor daily sales performance across various locations. Dashboards show which products are selling most & which stores need more support, enabling prompt, enabling quick inventory & marketing adjustments.

Business Analytics (BA) :

BA refers to skills, technologies & practices for continuous iterative exploration & investigation of past business performance to gain insight & drive business planning.

Key features of BA :

(1) Predictive Analysis :

Forecasts future trends based on historical data.

(2) Prescriptive Analysis :

Suggests actions to achieve desired outcomes.

(3) Statistical Analysis :

Uses statistical methods to understand data.

(4) Big Data Analytics :

Analyses large volumes of data from multiple sources.

Scenario Example: (E-commerce platform)

E-commerce platform uses BA to predict future buying trends by analysing customer behaviour & transaction history, and the platform recommends personalised products, optimizing marketing & increasing sales.

Expansion:

1) Objective:

- BI focuses on what happened & what is happening.
- BA focuses on what will happen & what should be done.

(2) Data Handling:

- BI deals with structured data.
- BA handles structured & unstructured data.

(3) Tools:

- BI tools → Tableau, Power BI, QlikView
- BA tools → SAS, R, Python

(4) Decision Making:

- BI supports strategic & operational decisions.
- BA supports strategic planning & predictive insights.

Conclusion:

BI and BA, while distinct, complement each other to provide a comprehensive business strategy.



PTO

ARCHITECTURE OF ARTIFICIAL NEURAL NETWORK (ANN):

Introduction:

An ANN is inspired by the biological neural networks of human brain. It is essential in AI applications like image recognition, NLP, etc.

Architecture:

(1) Input Layer:

It receives various ~~layers~~ inputs from the external environment. Each neuron here represents a feature of the input data.
e.g. Image Recognition (Input layer consists of pixels of image.)

(2) Hidden Layers:

These layers, located b/w the input & output, using functions like ReLU, Sigmoid, Tanh, etc.

e.g. Image Recognition (Hidden layers detect edges & patterns in image).

(3) Output Layer:

Produces final result of network.

e.g. Image Recognition (It classifies the images into categories like 'cat', 'dog', etc.)

Neurons:

(1) Structure:

Each neuron has weights, a bias & an activation function.

unction:

neurons take inputs, apply weights & biases & pass the result through an activation function to the next layer

Weights and Biases:

(1) Weights:

Transform input data within the network.

(2) Biases:

Allow models to represent patterns not passing through the origin.

Forward Propagation:

Input data is fed into the input layer, processed through hidden layers & transformed into output.

Back Propagation:

The network compares its output to the actual result, calculates the error & adjusts the weights & biases to minimise this error, iterating through the training data multiple times.

Conclusion:

The architecture of ANN, with its input, hidden & output layers & processes like forward & back propagation, makes it versatile in solving complex problems across various domains.