Group 1

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➢ **What Is Data Analytics?**

Data analytics is the science of analyzing raw data to make conclusions about that information. Many of the techniques and processes of data analytics have been automated into mechanical processes and algorithms that work over raw data for human consumption.

Data analytics is a broad term that defines the concept and practice (or, perhaps science and art) of all activities related to data. The primary goal is for data experts, including data scientists, engineers, and analysts, to make it easy for the rest of the business to access and understand these findings.

For example, manufacturing companies often record the runtime, downtime, and work queue for various machines and then analyze the data to better plan the workloads so the machines operate closer to peak capacity.

A successful data analytics practice can—should—provide a better strategy for where your business can go. Data analytics can help you:

- Find trends
- Uncover opportunities
- Predict actions, triggers, or events
- Make decisions

➤ What is the Difference Between Data And Information?

Data	Information
Data is unorganised and unrefined facts	Information comprises processed, organised data presented in a meaningful context
Data is an individual unit that contains raw materials which do not carry any specific meaning.	Information is a group of data that collectively carries a logical meaning.
Data doesn't depend on information.	Information depends on data.
It is measured in bits and bytes.	Information is measured in meaningful units like time, quantity, etc.
Raw data alone is insufficient for decision making	Information is sufficient for decision making
An example of data is a student's test score	The average score of a class is the information derived from the given data.

➤ What are the two types of data?

There are two general types of data – <u>Quantitative and Qualitative</u>

Quanlitative	Quantitative
information about qualities	**information that you can measure**
can't count	can count- can be discrete or continuous
<u>example:</u>	<u>example:</u>
An employee's highest qualification	price of products

➤ <u>Roles and Responsibilities of a Data Analyst</u>

Certain rules and responsibilities for a data analyst are:

1. **Determine the organizational goals** –

   It's important to understand clearly the goal by working with IT teams and management and data scientist and understanding the business and acting according to it is the key role

2. **Data mining from primary and secondary sources** -

   Process to structure the raw data underdstanding the various patterns in the data through the mathematical and computational process. It helps to generate various information and unlock the various insights. A data analyst has to collect data either from a company or extracting from external source (secondary data)or do research by himself or herself (primary data)

3. **Data cleansing and then compressing** -

   This is the first step before analyzing starts. When analyzing its important to correct the messy raw data to make strategic decisions. To remove those data which may distort our analysis.

4. **Pinpointing trends and patterns** –

   This complex data set are then utilized to discover its trends. Explore the facts from the data to answer a specific question using analytical or logical reasoning and also we use statistical tools and other programming such as R , python. A data analyst look for a short term and long term trends which help them understand where the current business operations and practices will take you if analysis are done well in a right direction.

5. **Creating reports with clear visualizations** -
   Reporting translates raw data in to information. It helps companies to monitor their online business and also be alert of falls outside ranges. Good reporting should raise questions about the business promises from its end- users being able to tell a compelling story with data is crucial to getting your point across and keeping your audience engaged. For this reason the data visualization can have make or break effect when it comes to the impact of your data. Data

analysts use ICACI high quality charts or graphs to present the data and their findings

6. **Maintaining databases and data systems**

   Data analysts have to ensure storage, availability and coherence of electronically stored data is always met organizational needs. Data analysts need to have an technical expertise regarding the data models and database deisgn and development to make the best use of it. They develop and maintain databases by acquiring data from primary and secondary sources and build scripts that will make data more flexible and scalable across the data sets

➢ **Data Analytics vs Data Analysis: What's The Difference?**

➢ **TYPES OF DATA ANALYSIS AND ITS APPLICATIONS**

   The two types of Data Analysis are

   • Exploratory Data Analysis
   • **Confirmatory Data Analysis**

EXPLORATORY DATA ANALYSIS

Exploratory is the method used to explore the big data set that will yield conclusions or predictions. According to the business analytics company Sisense, exploratory analysis is often referred to as a philosophy, and there are many ways to approach it. The process entails "figuring out what to make of the data, establishing the questions you want to ask and how you're going to frame them, and coming up with the best way to present and manipulate the data you have to draw out those important insights." Using exploratory analysis, data analysts are looking for clues and trends that will help them come to a conclusion.

The processes of EDA involve a myriad of tasks, including spotting mistakes and missing data; identifying important variables in the data set; testing a hypothesis related to a specific model; and establishing a model that can explain the data in the most succinct way possible. It also involves determining the best way to present the final assessment.

CONFIRMATORY DATA ANALYSIS

CDA is the process used to evaluate evidence by challenging their assumptions about the data. This part of the process is where they work backward from their conclusions and weigh the merits of the results of their work. It's like examining evidence and questioning witnesses in a trial, trying to determine the guilt or innocence of the defendant.

CDA involves processes like testing hypotheses, producing estimates, regression analysis (estimating the relationship between variables) and variance analysis (evaluating the difference between the planned and actual outcome).

➢ **Applications Of Data Analytics**

- Ecommerce - Predicting customer trends and optimizing prices are a few of the ways e-commerce uses Big Data analytics

- Marketing - Big Data analytics helps to drive high ROI marketing campaigns, which result in improved sales

- Education - Used to develop new and improve existing courses based on market requirements

- Healthcare - With the help of a patient's medical history, Big Data analytics is used to predict how likely they are to have health issues

- Media and entertainment - Used to understand the demand of shows, movies, songs, and more to deliver a personalized recommendation list to its users

- Banking - Customer income and spending patterns help to predict the likelihood of choosing various banking offers, like loans and credit cards

- Telecommunications - Used to forecast network capacity and improve customer experience

- Government - Big Data analytics helps governments in law enforcement, among other things

➤ Types of Data Analytics

The four types of Big Data analytics:

1. Descriptive Analytics

This summarizes past data into a form that people can easily read. This helps in creating reports, like a company's revenue, profit, sales, and so on. Also, it helps in the tabulation of social media metrics.

Use Case: The Dow Chemical Company analyzed its past data to increase facility utilization across its office and lab space. Using descriptive analytics, Dow was able to identify underutilized space. This space consolidation helped the company save nearly US $4 million annually.

2. Diagnostic Analytics

This is done to understand what caused a problem in the first place. Techniques like drill-down, data mining, and data recovery are all examples. Organizations use diagnostic analytics because they provide an in-depth insight into a particular problem.

Use Case: An e-commerce company's report shows that their sales have gone down, although customers are adding products to their carts. This can be due to various reasons like the form didn't load correctly, the shipping fee is too high, or there are not enough payment options available. This is where you can use diagnostic analytics to find the reason.

3. Predictive Analytics

This type of analytics looks into the historical and present data to make predictions of the future. Predictive analytics uses data mining, AI, and machine learning to analyze current data and make predictions about the future. It works on predicting customer trends, market trends, and so on.

Use Case: PayPal determines what kind of precautions they have to take to protect their clients against fraudulent transactions. Using predictive analytics, the company uses all the historical payment data and user behavior data and builds an algorithm that predicts fraudulent activities.

4. Prescriptive Analytics

This type of analytics prescribes the solution to a particular problem. Perspective analytics works with both descriptive and predictive analytics. Most of the time, it relies on AI and machine learning.

==Use Case==: Prescriptive analytics can be used to maximize an airline's profit. This type of analytics is used to build an algorithm that will automatically adjust the flight fares based on numerous factors, including customer demand, weather, destination, holiday seasons, and oil prices.