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| --- | --- | --- |
|  | **Data** | **Information** |
| **Description** | Qualitative/ Quantitative variables that present themselves with the potential to be developed into ideas or analytical conclusions. | Data that is structured and collated to further its meaning and contextual usefulness. |
| **Format** | Data follows the form of either letters, numbers or characters. | Information follows the format of either ideas or references |
| **Representation** | Data is structured either in graphs, data trees, flowcharts, or tables. | Information is represented as ideas, thoughts, and languages after collating the data acquired. |
| **Meaning** | Data doesn’t serve any purpose unless given to. | Data when interpreted and assigned with some meaning derived out of it, gives information. |
| **Interrelation** | Data is information collected | Information is data processed |
| **Features** | Data is raw and doesn’t contain any meaning unless analyzed. | Information is data collated and produced to further a logical meaning. |
| **Interdependence** | Data doesn’t depend on information. | Information can’t exist without data. |
| **Unit** | Data is measured in bits and bytes. | Information if mostly measured in units like quantity, time et al. |
| **Use Case for Decision Making** | Data alone doesn’t pertain to the qualities to help derive decisions. | The information contains analytical coherence to help derive a decision. |
| **Use Case for Researchers** | Data acquired by researchers might become useless if they have no analytical inferences to make. | Information adds value and usefulness to researchers since they are readily available. |

**DATA ANALYTICS RESEARCH**

**1.WHAT IS THE DIFFERENCE BETWEEN DATA AND INFORMATION**

**2. TWO TYPES OF DATA**

Data can be of two types:

* **Qualitative data:** It is non-numerical data. For e.g., the texture of the skin, the colour of the eyes, etc.
* **Quantitative data:** Quantitative data is given in numbers. Data in the form of questions such as “how much”, “how many”, gives the quantitative data.

**3. ROLES AND RESPONSIBILITIES OF A DATA ANALYST**

Depending upon their Level of Expertise, Data Analysts may have the following Role

* **Determine Organizational Goals:**

One of the first and most important roles of a Data Analyst is to determine the Organization’s Goal. That involves working with:

* IT Teams
* Management
* Data Scientists

* **Mining Data**

Data mining is a process to structure the raw data and formulate or recognize the various patterns in the data through the mathematical and computational algorithms. It helps to generate new information and unlock the various insights. Data Analysts have to often mine or collect data. Getting data from the company database or extracting it from external sources to do any sort of research is one of the major roles of any Data Analyst.

* **Data Cleaning**

Data cleansing is the first step in the overall data preparation process and is the process of analyzing, identifying and correcting messy, raw data. When analyzing organizational data to make strategic decisions Data Analysts must start with a thorough data cleansing process. The good analysis rests on clean data–it’s as simple as that. Cleaning involves removing data that may distort your analysis or standardizing your data into a single format.

* **Analyzing Data**



Needless to say, this role is a must for any Data Analyst. [Data analytics](https://www.edureka.co/blog/big-data-analytics/) is the art of exploring the facts from the data with specific to answer a specific question.

It is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. One uses statistical tools to analyze and interpret the data.

There are various tools and programming languages used in the analysis.

* **Pinpointing Trends and Patterns**



A large time of a Data analyst is spent on finding trends, correlations, and patterns in the complicated datasets. Trends are also important. Data Analysts look for both short-term and long-term trends.

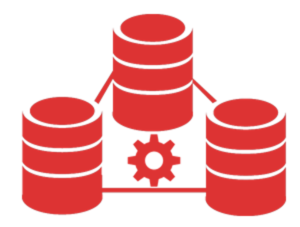
* **Creating Reports with Clear Visualizations**



Reporting translates raw data into information. Reporting helps companies to monitor their online business and be alerted to when data falls outside of expected ranges. Good reporting should raise questions about the business 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, data visualization can have a make-or-break effect when it comes to the impact of your data. Analysts use eye-catching, high-quality charts and graphs to present their findings in a clear and concise way.

* **Maintaining Databases and Data Systems**

Data Analysts have to ensure that the storage, availability, and coherence of electronically stored data meet an organization’s needs.  Data Analyst needs to have technical expertise regarding data models, database design 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 our data evaluation process more flexible or scalable across datasets.

**4.DIFFERENCE BETWEEN DATA ANALYSIS AND DATA ANALYTICS**

**DATA ANALYTICS**

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](https://www.bmc.com/blogs/data-engineer-vs-data-scientist/), to make it easy for the rest of the business to access and understand these findings.

Data that sits raw, as-is, has no value. Instead, it’s what you do with that data that provides value. Data analytics includes all the steps you take, both human- and machine-enabled, to discover, interpret, visualize, and tell the story of patterns in your data in order to drive business strategy and outcomes.

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

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

**DATA ANALYSIS**

Data analysis consists of cleaning, transforming, modelling, and questioning data to find useful information. (It’s generally agreed that other slices are other activities, from collection to storage to visualization.)

The act of data analysis is usually limited to a single, already prepared dataset. You’ll inspect, arrange, and question the data. Today, in the 2020s, a software or “machine” usually does a first round of analysis, often directly in one of your databases or tools. But this is augmented by a human who investigates and interrogates the data with more context.

When you’re done analyzing a dataset, you’ll turn to other data analytics activities to:

* Give others access to the data
* Present the data (ideally with data visualization or storytelling)
* Suggest actions to take based on the data

A vital point of data analysis is that the analysis already captures data, meaning data from the past.

**5.TYPES OF DATA ANALYSIS APPLICATION**

There are two types of data analysis applications.

* Exploratory Data Analysis
* Confirmatory Data Analysis

**EXPLORATORY DATA ANALYSIS**

Exploratory (versus confirmatory analysis) is the method used to explore the big data set that will yield conclusions or predictions. According to the [business analytics company Sisense](https://www.sisense.com/blog/exploratory-data-analysis/), 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).

**6.APPLICATION AREAS OF DATA ANALYTICS**

Not just one or two, the use of data analytics is in every field you can see around. Be it from Online shopping, or Hitech industries, or the government, everyone uses data analytics to help them in decision making, budgeting, planning, etc. The data analytics are employed in various places like:

**Transportation**

 Data analytics can be applied to help in improving Transportation Systems and intelligence around them. The predictive method of the analysis helps find transport problems like Traffic or network congestions. It helps synchronize the vast amount of data and uses them to build and design plans and strategies to plan alternative routes, reduce congestions and traffics, which in turn reduces the number of accidents and mishappenings.  Data Analytics can also help to optimize the buyer’s experience in the travels through recording the information from social media. It also helps the travel companies fixing their packages and boost the personalized travel experience as per the data collected.

**Logistics and Delivery**

There are different logistic companies like DHL, FedEx, etc that uses data analytics to manage their overall operations. Using the applications of data analytics, they can figure out the best shipping routes, approximate delivery times, and also can track the real-time status of goods that are dispatched using GPS trackers. Data Analytics has made online shopping easier and more demandable.

**Example of Use of data analytics in Logistics and Delivery:**

When a shipment is dispatched from its origin, till it reaches its buyers, every position is tracked which leads to the minimizing of the loss of the goods

**Web Search or Internet Web Results**

The web search engines like Yahoo, Google uses a set of data to give you when you search a data. Whenever you hit on the search button, the search engines use algorithms of data analytics to deliver the best-searched results within a limited time frame. The set of data that appears whenever we search for any information is obtained through data analytics.

The searched data is considered as a keyword and all the related pieces of information are presented in a sorted manner that one can easily understand. For example, when you search for a product on amazon it keeps showing on your social media profiles or to provide you with the details of the product to convince you by that product.

**Healthcare**

Applications of data analytics in healthcare can be utilized to channel enormous measures of information in seconds to discover treatment choices or answers for various illnesses. This won’t just give precise arrangements dependent on recorded data yet may likewise give accurate answers for exceptional worries for specific patients.

**Manufacturing**

Data analytics helps the manufacturing industries maintain their overall working through certain tools like prediction analysis, regression analysis, budgeting, etc. The unit can figure out the number of products needed to be manufactured according to the data collected and analyzed from the demand samples and likewise in many other operations increasing the operating capacity as well as the profitability

**7.TYPES OF DATA ANALYSIS**

There are four types of data analysis that are in use across all industries. While we separate these into categories, they are all linked together and build upon each other.

The four types of data analysis are:

* Descriptive Analysis
* Diagnostic Analysis
* Predictive Analysis
* Prescriptive Analysis

**DESCRIPTIVE ANALYSIS**

The first type of data analysis is descriptive analysis. It is at the foundation of all data insight. It is the simplest and most common use of data in business today. Descriptive analysis answers the “what happened” by summarizing past data, usually in the form of dashboards.

The biggest use of descriptive analysis in business is to track Key Performance Indicators (KPIs). KPIs describe how a business is performing based on chosen benchmarks.

**DIAGNOSTIC ANALYSIS**

Diagnostic analysis takes the insights found from descriptive analytics and drills down to find the causes of those outcomes. Organizations make use of this type of analytics as it creates more connections between data and identifies patterns of behaviour.

A critical aspect of diagnostic analysis is creating detailed information. When new problems arise, it is possible you have already collected certain data pertaining to the issue. By already having the data at your disposal, it ends having to repeat work and makes all problems interconnected.

**PREDICTIVE ANALYSIS**

This type of analysis is another step up from the descriptive and diagnostic analyses. Predictive analysis uses the data we have summarized to make logical predictions of the outcomes of events. This analysis relies on statistical modelling, which requires added technology and manpower to forecast. It is also important to understand that forecasting is only an estimate; the accuracy of predictions relies on quality and detailed data.

While descriptive and diagnostic analysis are common practices in business, predictive analysis is where many organizations begin show signs of difficulty. Some companies do not have the manpower to implement predictive analysis in every place they desire. Others are not yet willing to invest in analysis teams across every department or not prepared to educate current teams.

**PRESCRIPTIVE ANALYSIS**

The final type of data analysis is the most sought after, but few organizations are truly equipped to perform it. [Prescriptive analysis](https://searchcio.techtarget.com/definition/Prescriptive-analytics) is the frontier of data analysis, combining the insight from all previous analyses to determine the course of action to take in a current problem or decision.

Prescriptive analysis utilizes state of the art technology and data practices. It is a huge organizational commitment and companies must be sure that they are ready and willing to put forth the effort and resources.

[Artificial Intelligence](https://go.forrester.com/blogs/16-11-02-artificial_intelligence_fact_fiction_how_enterprises_can_crush_it/) (AI) is a perfect example of prescriptive analytics. AI systems consume a large amount of data to continuously learn and use this information to make informed decisions. Well-designed AI systems are capable of communicating these decisions and even putting those decisions into action. Business processes can be performed and optimized daily without a human doing anything with artificial intelligence.