Modern Data Ecosystem and the Role of Data Analytics

**Key players in the Data Ecosystem**:

**Data engineering** converts raw data into usable data. **Data analytics** uses this data to generate insights. **Data scientists** use data analytics and data engineering to predict the future using data from the past, **business analysts** and business intelligence analysts use these insights and predictions to drive decisions that benefit and grow their business.

Data Scientist:

Data scientists analyze data for actionable insights and build machine learning or deep learning models that train on past data to create predictive models. Data scientists are people who answer questions such as, how many new social media followers am I likely to get next month, or what percentage of my customers am I likely to lose to competition in the next quarter, or is this financial transaction unusual for this customer? Data scientists require knowledge of mathematics, statistics, and a fair understanding of programming languages, databases, and building data models. They also need to have domain knowledge.

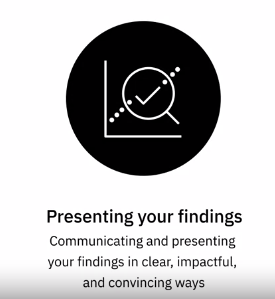
Data Analysis:

Data analysis is the process of gathering, cleaning, analyzing and mining data, interpreting results, and reporting the findings. With data analysis we find patterns within data and correlations between different data points. And it is through these patterns and correlations that insights are generated, and conclusions are drawn. Data analysis helps businesses understand their past performance and informs their decision-making for future actions. Using data analysis, businesses can validate a course of action before committing to it. Saving valuable time and resources and also ensuring greater success.

The Data Analysis Process:







Data Analytics:

Data analytics as a process or a phenomenon of taking information gathered from a relevant population, maybe our customers or our social audience, and breaking that information down into subsets, and using that data to make decisions about products or services that we want to offer, or in cases of the digital environment that we're in, making decisions about certain pieces of content that we want to publish so that it appeals to our target audience.

**Descriptive Analytics,** that helps decode “What happened.”

**Diagnostic Analytics**, that helps us understand “Why it happened.”

**Predictive Analytics**, that analyzes historical data and trends to suggest “What will happen next.”

**Prescriptive Analytics**, that prescribes “What should be done next.”

Responsibilities of a Data Analyst:

Acquiring data from primary and secondary data sources, Creating queries to extract required data from databases and other data collection systems, Filtering, cleaning, standardizing, and reorganizing data in preparation for data analysis, Using statistical tools to interpret data sets, Using statistical techniques to identify patterns and correlations in data, Analyzing patterns in complex data sets and interpreting trends, Preparing reports and charts that effectively communicate trends and patterns, Creating appropriate documentation to define and demonstrate the steps of the data analysis process.

Skills that a Data Analyst need:

**For technical skills**:

Expertise in using spreadsheets such as **Microsoft Excel or Google Sheets**

Proficiency in statistical analysis and visualization tools and software

**IBM Cognos, IBM SPSS, Oracle Visual Analyzer, Microsoft Power BI, SAS, and Tableau**

Proficiency in programming languages

**R, Python, and in some cases C++, Java, and MATLAB**

Databases

Good knowledge of **SQL**, and ability to work with **data in relational and NoSQL** databases

The ability to access and extract data from data repositories such as **data marts, data warehouses, data lakes, and data pipelines**

Familiarity with Big Data processing tools such as

**Hadoop, Hive, and Spark.**

**Functional Skills:**

Proficiency in Statistics

Analyze data, validate the analysis, identify fallacies and logical errors

Analytical skills

Research and interpret data, theorize, make forecasts

Problem-solving skills

Come up with possible solutions for a given problem

Probing skills

Identify and define the problem statement and desired outcome

Data Visualization skills

Create clear and compelling visualizations to present the analysis

Project management skills

Manage the process, people, dependencies and timelines

**Soft Skills:**

**Ability to**:

* Work collaboratively with business and cross-functional teams
* Communicate effectively to report and present findings
* Tell a compelling and convincing story
* Gather support and buy-in for work

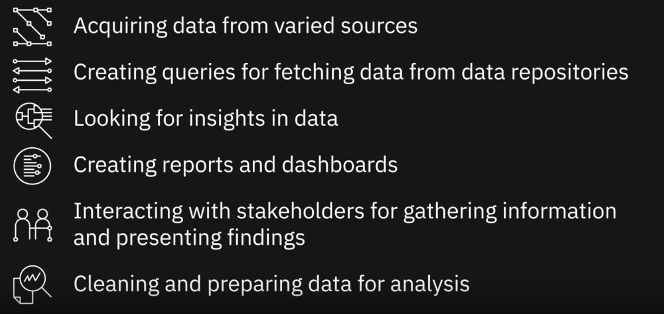
**Curiosity**

Allowing new questions to surface and challenging own assumptions and hypotheses

**Intuition**

Having a sense of the future based on pattern recognition and past experiences

A day in the life of a Data Analyst:



What are some of the applications of Data Analytics in todays’ world?

* Use of sentiment analysis and tweets and stories to inform investment decisions
* Use of satellite imagery data to track the development of industrial activities
* Use of geolocation data to track store traffic and predict sales volume