# VISUAL INSIGHT OF DATA EXPLORING DATA GRAPHICALLY

➢ **Introduction of Data Visualization: Definition, Benefits, and Examples**

- Data visualization helps data professionals tell a story with data.
- Data visualization is a powerful way for people, especially data professionals, to display data so that it can be interpreted easily.
- It helps tell a story with data, by turning spreadsheets of numbers into stunning graphs
- and charts.

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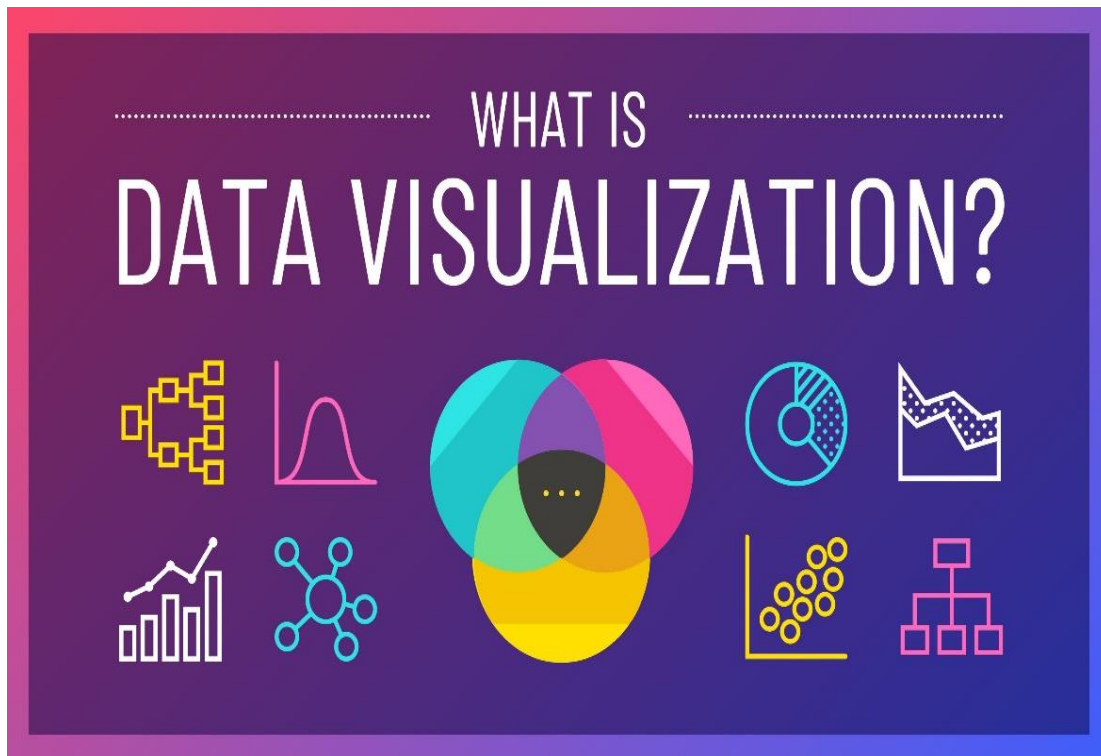
> ## What is data visualization?
> - Data visualization is the representation of information and data using charts, graphs, maps, and other visual tools. Data visualization is the presentation of data like charts, infographics, animations, etc., through which you use graphics.
> - These visualizations allow us to easily understand any patterns, trends, or outliers in a data set. It can help you to show the difficult data and information in an easy way to understand easily.
> - The purpose of data visualization is to help drive informed decision-making and to add colourful meaning to an otherwise bland database.
> - For example, the health agency in a government might provide a map of vaccinated regions

> ## Tools for visualizing data
> - The following are common data visualization tools that could suit your needs.

i. Tableau
ii. Google Charts
iii. Dundas BI
iv. Power BI
v. JupyteR
vi. Infogram
vii. ChartBlocks
viii. D3.js
ix. FusionCharts
x. Grafana

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- ➢ **Benefits of data visualization**
  - Data visualization can be used in many contexts in nearly every field, like public policy, finance, marketing, retail, education, sports, history, and more. Here are the benefits of data visualization:

1. **Storytelling:**
People are drawn to colours and patterns in clothing, arts and culture, architecture, and more. Data is no different—colours and patterns allow us to visualize the story within the data.

2. **Accessibility:**
Information is shared in an accessible, easy-to-understand manner for a variety of audiences.

3. **Visualize relationships:**
It's easier to spot the relationships and patterns within a data set when the information is presented in a graph or chart.

4. **Exploration:**
More accessible data means more opportunities to explore, collaborate, and inform actionable decisions.

5. **Faster Process**
The visualization of the data can work quickly and provide the benefit of using visuals. The process can work 60,000 times faster and easier in the brain than text. According to neuroscientists, it can be shown that human brains can process images for little pictures of 13 milliseconds. It can help you and those people who don't want to find large data sets and take information to make conclusions.

6. **Learning**
The visual format of data presentation and visualization can help people to learn about things. Research has shown that visuals can help you by teaching you ways and methods. This simulation method can help you improve your environment and maintain your learning. You can clarify your content and keep them engaged.

7. **Identify Trends**
The middle aspect of the data is the data visualization. It can help show the data formats that can be understood easily. Identifying trends allows you access to the data and the nonexperts. It can make it easier to find out the new patterns and trends through the data. You can access the representation of the visuals and highlight the recent directions through the spreadsheet of the rows.

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➢ **Data visualization examples**

- In the early days of visualization, the most common visualization technique was using a <u>Microsoft Excel</u> spreadsheet to transform the information into a <u>table</u>, bar graph or pie chart. While these visualization methods are still commonly used, more intricate techniques are now available, including the following:
- These are a few examples of data visualization in the real world:

1. Data science:
Data scientists and researchers have access to libraries using programming languages or tools such as Python or R, which they use to understand and identify patterns in data sets. Tools help these data professionals work more efficiently by coding research with colors, plots, lines, and shapes.

2. Marketing:
Tracking data such as web traffic and social media analytics can help marketers analyze how customers find their products and whether they are early adopters or more of a laggard buyer. Charts and graphs can synthesize data for marketers and stakeholders to better understand these trends.

3. Finance:
Investors and advisors focused on buying and selling stocks, bonds, dividends, and other commodities will analyze the movement of prices over time to determine which are worth purchasing for short- or long-term periods. Line graphs help financial analysts visualize this data, toggling between months, years, and even decades.

4. Health policy:
Policymakers can use choropleth maps, which are divided by geographical area (nations, states, continents) by colors. They can, for example, use these maps to demonstrate the mortality rates of cancer or ebola in different parts of the world.

5. Politics.
A common use of data visualization in politics is a geographic map that displays the party each state or district voted for.

6. **Healthcare.**
Healthcare professionals frequently use choropleth maps to visualize important health data. A choropleth map displays divided geographical areas or regions that are assigned a certain color in relation to a numeric variable. Choropleth maps allow professionals to see how a variable, such as the mortality rate of heart disease, changes across specific territories.

7. Logistics.
Shipping companies can use visualization tools to determine the best global shipping routes.

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➢ Types of data visualization

Visualizing data can be as simple as a bar graph or scatter plot but becomes powerful. Here are some common types of data visualizations:

1. **Table:**

A table is data displayed in rows and columns, which can be easily created in a Word document or Excel spreadsheet.

Information is presented in tabular form with data displayed along an x and y axis, usually with bars, points, or lines, to represent data in comparison. An infographic is a special type of chart that combines visuals and words to illustrate the data.

2. **Chart or graph:**
   - **Gantt chart:** A Gantt chart is a bar chart that portrays a timeline and tasks specifically used in project management.
   - **Pie chart:** A pie chart divides data into percentages featured in "slices" of a pie, all adding up to 100%.

3. **Geospatial visualization:**

Data is depicted in map form with shapes and colors that illustrate the relationship between specific locations, such as a choropleth or heat map.

4. **Dashboard:**

Data and visualizations are displayed, usually for business purposes, to help analysts understand and present data.

➢ Importance of Data Visualization

It is essential because it can help you think about the products and the information about their amount. You can make the data around 1.7 MB every second. This is equal to the average position of the mobile web pages. Data creation occurs in an exponential amount, which is almost 90 % of all data created in the past two years. It aims to analyze visuals and data that can manage and understand the conveying of data and information. It can be linked through big data analytics.

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> **Types of Data Visualization**
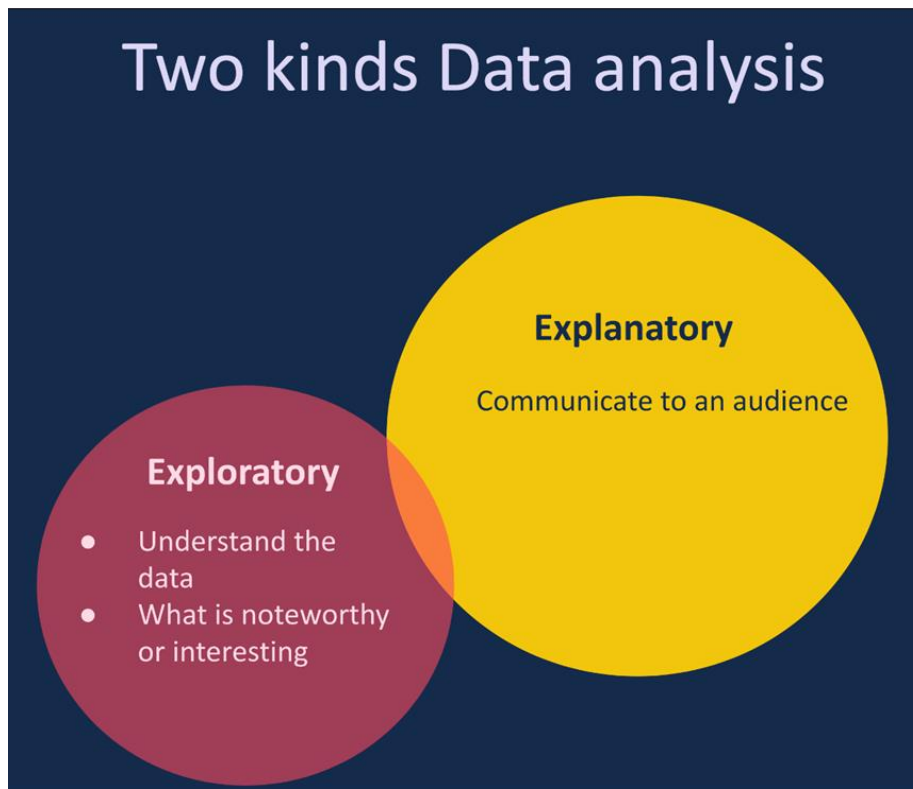
Exploratory
Explanatory data analytics are just the starting investment of your data set. Initially, it can help to know about the main points and features. You can use data visualizations because they are excellent tools to help promote various spreadsheets and rows into valuable visuals.

Explanatory
The explanatory data visualization can help summarize the aspects of the data set. You can highlight the trends that can help to identify further. In explanatory data, visualization comes ahead at the end of the data analysis process. In conducting research, you should communicate and share your results carefully.

> **What is the difference between exploratory and explanatory data Visualization?**

Exploratory Data Visualizations are charts or graphs that are usually created during the data analysis phase in order to explore the data and to look for patterns.
Explanatory Data Visualizations are charts or graphs that are used to explain these findings to others.

> Data visualization can help offer many tools and features for showing information in the format of graphics and looking at visual data. This can help you identify trends, patterns, and exceptions within the vast data set. The decision-maker is organized through many types of analysts and enables the presence of enormous amounts of data. For making data-driven decisions, a visualization is the best tool.

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