5) Basics of Data Visualization

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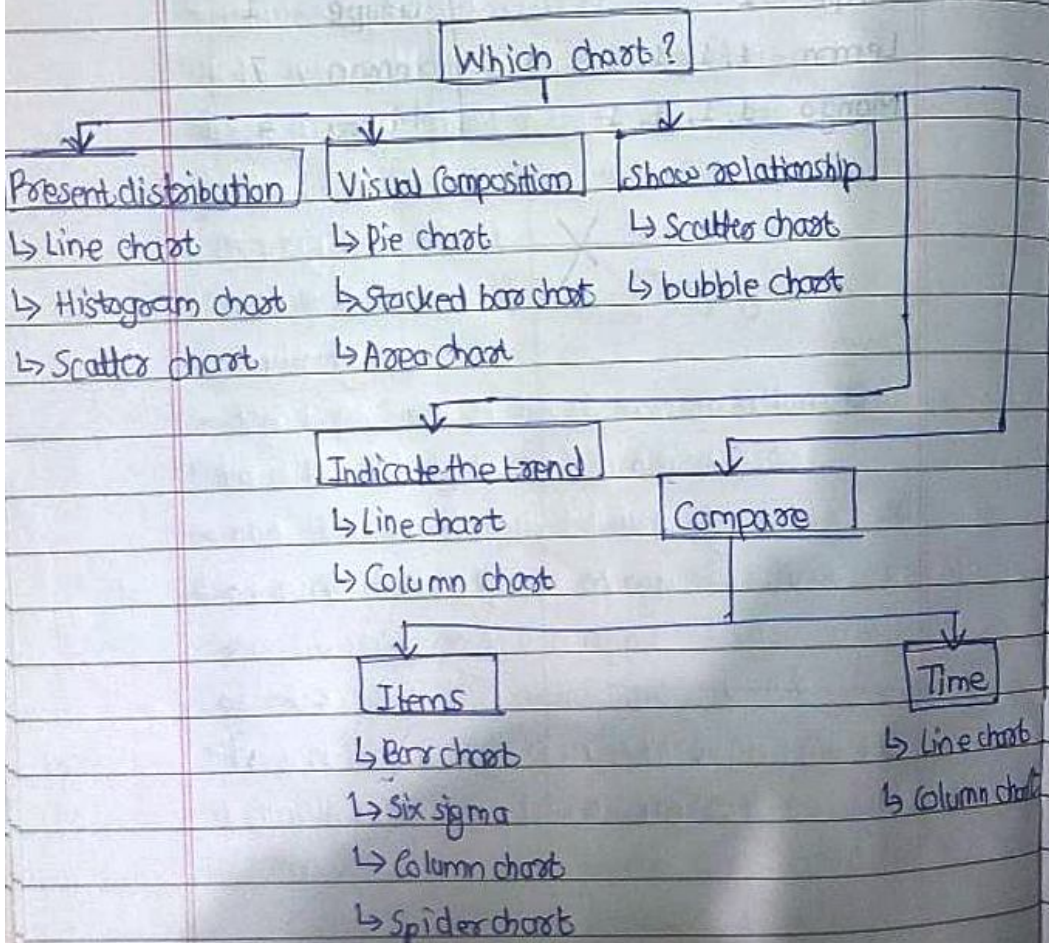
Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs and maps, data visualization provides an accessible way to see and understand trends, outliers and patterns in data.

Dashboards:
- Data visualization tools that allow all users to understand the analytics that matter to their business, department or project.
- A tool to display data visualizations in a way that is immidiately understood.



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Types of Dashboard:

1) Operational Dashboard
- Dashboard in which metrics are updated in real-time, showing performance of data related to the operations of data in a day, then it is called operational dashboard.
- Designed to provide, at a glance, a comprehensive snapshot of performance of the day.
- Gives viewer information related to performance of organisation at an immidiate view.

2) Analytical Dashboard:
- In these dashboards, we use data from the past to identify the trends that can help to make decisions about the future.
- Comparing and contrasting data across multiple variables is a crucial aspect of data analytics.
- A user must be able to compare data across time.
- A users must be able to perform slicing, dicing, drill down.

3) Strategic Dashboard
- If one has defined key performance indicators and is tracking performance in relation to those KPI's, then it generates strategic dashboard.
- They look at benchmark performance data from last quarter and compare it with ~~previous~~ current period.
- Composed of data from multiple sources.
- Often share metrics that are important to the whole organisation

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The guidelines for designing Dashboard:

1) Hierarchy:
- Make it clear to the viewers what is most important by defining information levels.
- Display the more important information on the top left. Move towards the bottom right direction with the information from more to less important level.
- It is also possible to divide the information into categories and display them in different views.

Do	Don't
- Display key stats or summarized data where it gets user attention at first glance. The top left is the best position to display important	- Don't display key stats at a random place in dashboard.

2) Simplicity:
- Don't provide a lot of information that would be difficult to absorb for the users.
- Use fewer columns to display information
- Reduce clutter by removing redudant content.

Do	Don't
- Present information in a simple form with fewer column	- Presenting a lot of info makes it difficult to scan the dashboard for the user.

3) Consistency:
- To make your dashboard easier to read, use similar visualizations and layout between groups
- Put related information close to each other.
- Group related content visually; so easy to understand

Do	Don't
- Use similar visualizations and layouts to display information looks better and also makes comparison easier	- Presenting different visualizations and layouts make the comparison data difficult.

4) Proximity:
- Displaying related information together in dashboard will help the user to understand it quickly.

5) Alignment:
- Elements in dashboard are needed to align visually to make it look balanced.
- Do align dashboard elements with each other to organise better.
- Try to place dashboard widgets in a grid view.
- An un-aligned view does not give good impact to user.

6) Whitespace:
- Use whitespace to group related information visually.

7) Color:
- Use effective color scheme to grab user's attention and help them to go through the information easily.

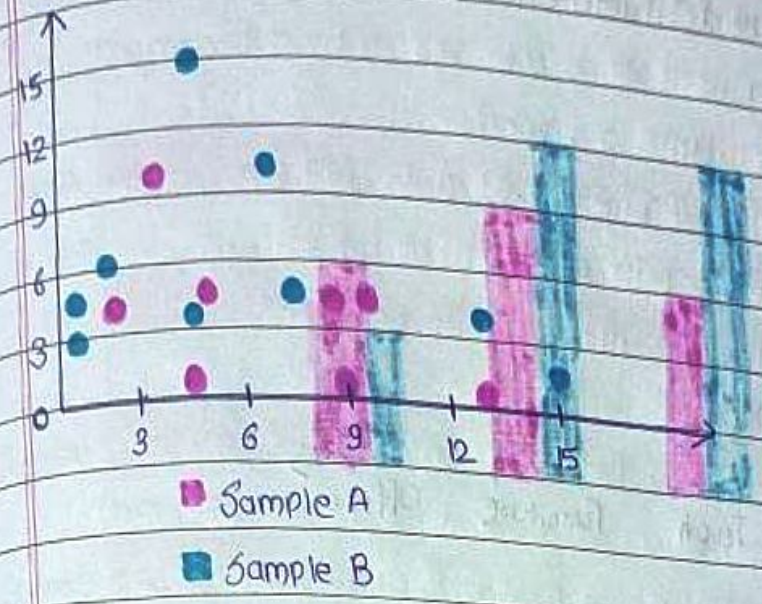
8) Fonts:
- Standard fonts are best fonts to display on a dashboard unless there is a specific need to use other fonts.

9) Number format:
- Displaying numbers with the more than required level of precision make them difficult to read and understand.
- Provides an overview and allows users to drill down into the data.
- Use visualization to support the user.

Don't	Do
- Long numbers are difficult to understand. Ex:- 60,567, 40,456.22	- Data in compact form looks better & easier to understand. Ex:- 60.6K, 40.5K

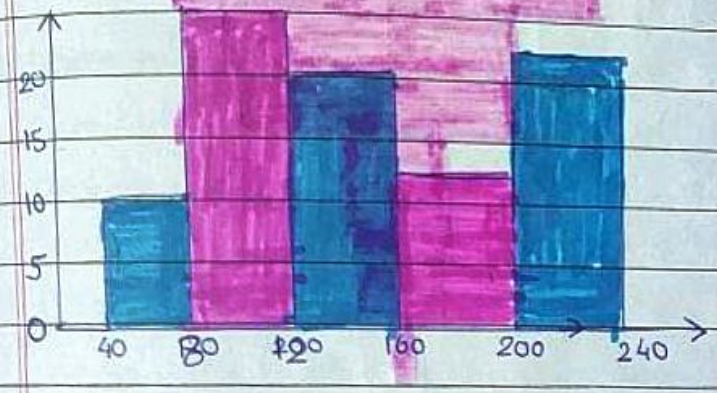
Types of data visualizations:

1) Scatter plot:
- Use cartesian coordinates to display values for typically two variables for set of data.
- The data are displayed as collection of points, each having the value of one variable determining the position on the horizontal axis and the value of other variable determining the position on vertical axis.



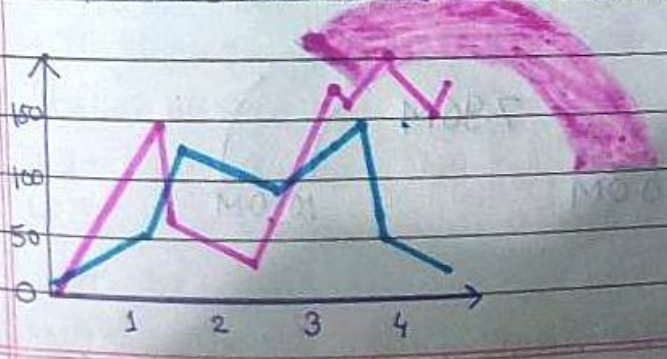
2) Histogram:

- Graphical display of data using bars of different heights.
- Each bar groups numbers in ranges.

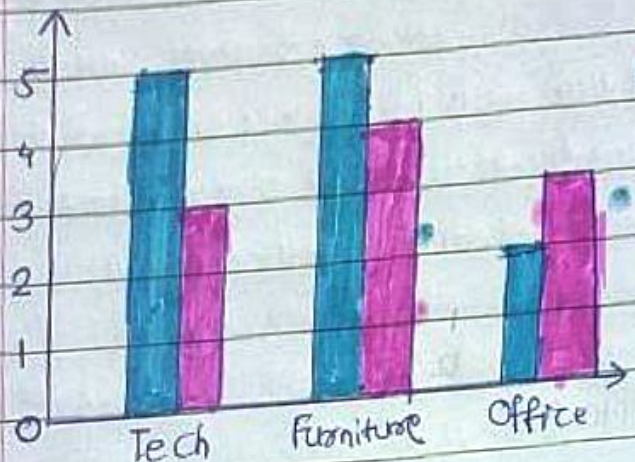


3) Line Graph:

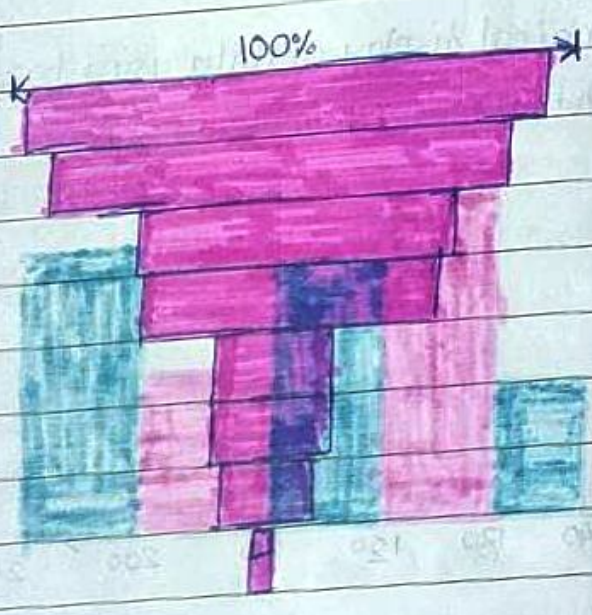
- Time series chart shows trends in data.



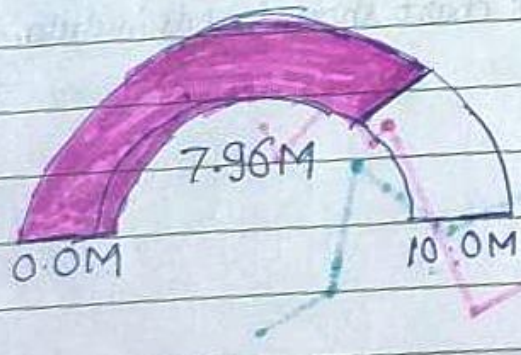
4) Clustered Column chart:



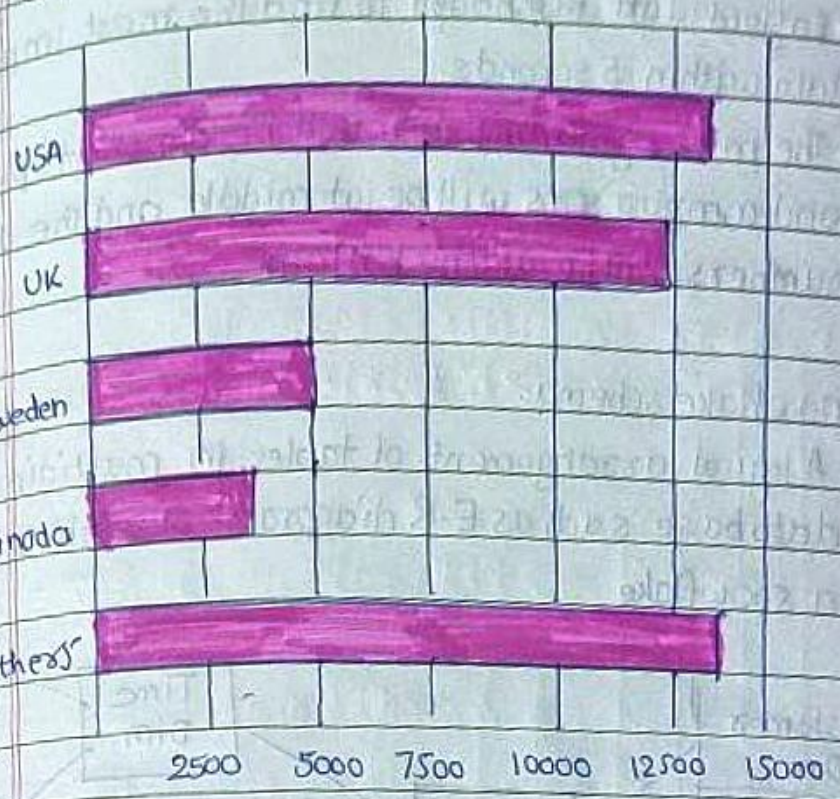
5) Funnel :



6) Guage



7) Bar-Chart



8) ~~Waterfall Chart~~

Common characteristics of dashboard:

1) Dashboards align with goals.
2) Use of right visuals
3) Place Numbers into context
4) Keep data current.
   ↳ An effective dashboard provides the data that will help users modify their performance according to real-time market changes.
   ↳ Displaying out-of-date info does dis-service to the users.
5) Tell a story.
   ↳ The best dashboards connect the past, present and the future.
   ↳ All dashboards should have option to drill down further into the numbers.

6) Logical Layout:

↳ Layout data dashboard to find the most important data within 5 seconds.

↳ The most significant data will be on the top. Trends and comparisons will be at middle and the deeper numbers will be at the bottom.

Snowflake schema:

- A logical arrangement of tables in multidimensional database such as E-R diagram resembles like a snowflake