**A green and black logo

Description automatically generated with low confidenceData Visualization (4461306)**

**Project Report on**

**Mobile sales in India during the year (2020-21)**

**Master of Science in**

**Applied Computer Science**

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13. Introduction**:**

Data visualization is a graphical representation of dimensional values and the measured values using various charts and graphs available in the respective visualization tools. The main motive of data visualization is to identify patterns, trends, forecasting and outliers in large datasets. The purpose of this project is to visualize the values in a practical dataset for academic purposes.

1. Domain of the Data set**:**

For the project purpose the data set taken is considered from the Sales and analytics domain.

1. Data file**:**

The data set used for this project is Mobile sales data in India during the year (2020-21).

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Above attached is the data set used in this project.

1. Data Source**:**

The data considered is the open-source data taken through online medium from Kaggle Website. The link to the Data source is.

<https://www.kaggle.com/datasets/mallerakesh/mobile-sales-dataset>

1. Number of records and columns**:**

This Data set consists of 700 records and 16 columns having attributes:

Segment, State, Product, Discount Band, Units Sold, Manufacturing Price, Sale Price, Gross Sales, Discounts, Sales, COGS, Profit, Date, Month Number, Month Name, Year

1. Visualization tools selected**:**

The visualization tool selected for this project is Tableau 2023.1

1. Data cleaning strategies**:**

The Data set selected for this project is a cleaned Data set. The Data set selected is Mobile sales data in India during the year (2020-21) and this Data set contains the legitimate values and it does not contain any null values or any empty values in the attributes and no Data cleaning strategies were used.

1. Goals and charts generated**:**

Goal 1: Visualizing state wise number of units sold.

Chart 1: The Chart generated for this Goal is Choropleth Map.

Chart 1-2: Map chart using different layouts.

Goal 2: Visualizing product wise total sales.

Chart 2: Lollipop chart which is combination of both Bar graph and Circle plot.

Chart 2-2: Charts using multiple fields like combination of both line chart and Shape chart.

Goal 3: Representing Quarter wise profits for different products.

Chart 3: Line chart representing quarter wise profits and predicting the profits using the forecasting option.

Goal 4: Visualizing Total cost of each product.

Chart 4: Tree Map representing total cost of each product.

Goal 5: Comparing sales and profits based on the various segments.

Chart 5: Chart representing the trend line in the analytics section.

Chart 5-2: Chart with the drop lines is used for this goal.

Goal 6- Visualizing state wise profits.

Chart 6: Pie chart representing state wise profits.

Chart 6-2: Product wise individual bar graph representing the average profit using reference line.

Chart 6-3: Packed bubble chart.

Goal 7: Top 5 to 15 State wise count of profit of products.

Chart 7: State wise representation of profit with Top 5 to 15 states.

1. Stories related to the Charts**:**

**Story 1**: The main motive of this visualization is to represent the different state wise number of units sold. To represent this data, choropleth map is used with different states having different color intensities which means state having darker shade has highest units sold in it whereas state with lighter shade has lowest units sold in it. Filter is used to select the products that are to be plotted. We can see that Gujarat state has the highest value with 11280 units sold and Bihar state has lowest value with 780 units sold.

**Story 1-2**: The motive of this visualization is same as the motive in Goal 1. To represent the data, map chart is used representing different states in different colors and Street type map layout is considered. Units for the number of units sold is edited in the tool tip for better understanding.

**Story 2**: The main motive of this visualization is to represent the product wise total sales. To represent the data, a lollipop chart is used. This is done by creating different charts in different fields and merging them by applying dual axis option. We can see from the visualization that the product Realme 8 pro has the highest sales with 611,195,889 sales and the product Xiaomi Redmi 9i 128 GB has the lowest sales with 122882379 sales.

**Story 2-2**: The motive of this visualization is same as the motive in Goal 2. To represent the data, line charts along with shape chart are taken in different axes respectively and merged with the help of dual axis option to view various designs of charts. From this visualization we can see that Realme 8 Pro has the highest sales with 611,195,889 sales and Xiaomi Redmi 9i 128 GB has the lowest sales with 122,882,379 sales.

**Story 3**: The main motive of this visualization is to represent the quarter wise profits for different products. From the visualization we can see that line charts are used to represent profits in different quarters in a year. For example, we can see that profits of Vivo V17 Pro have increased from the third quarter to the fourth quarter in the year 2020. In this visualization we can also see the prediction of profit margin in the next year, that is 2022. This is done by using the analytics function called forecasting.

**Story 4**: The main motive of this visualization is to represent the Total cost of each product. For this visualization a calculated field called TotalCost is developed. To develop this field Unit sold attribute is multiplied with Manufacturing price attribute. From the visualization we can see that Realme 8 Pro has the highest TotalCost and Xiaomi Redmi 9i 128GB has the lowest TotalCost.

**Story 5**: The main motive of this visualization is to represent the projection of sales and profits based on various segments. We can see that various colored circles represent different segments, and a trend line is inserted to demonstrate the values. We can see that the shopping mall segment has the highest profit in terms of sales value whereas the enterprise segment has lowest profit in terms of sales value.

**Story 5-2**: The motive of this visualization is same as the motive in Goal 5. To represent the data, scatter plot is used each plot represents product details in different states. Filter is used to select the products that are to be plotted. Drop lines are used to improvise the visualization. This can be seen when an individual plot is selected.

**Story 6**: The main motive of this visualization is to represent the profits in various states. We can see that each state is represented in different colors and is incorporated in the pie chart. Filter is used to select the products that are to be plotted. We can also see that state Maharashtra has the highest profit and the state Bihar has the lowest profit.

**Story 6-2**: The motive of this visualization is same as the motive in Goal 6. To represent the data, a vertical bar graph is used and is segregated based on the products. Reference lines are drawn across each product graph showing the Average profits of the product based on sales in each state. Filter is used to select the products that are to be plotted. We can see that Average profit is higher for the product Realme 8 Pro which is Rs. 9855367 and lower for the product Xiaomi Redmi 9i 128GB which is Rs. 1899450

**Story 6-3**: The motive of this visualization is same as the motive in Goal 6. To represent the data packed bubble is used and each state is represented in different colors. Filter is used to select the products that are to be plotted and the state with largest bubble has the highest profit and the state with smallest bubble has the lowest profit.

**Story 7**: The main motive of this visualization is to represent the top 5 to top 15 states based on the count of profit values. This visualization is more of a tabular representation and parameter is added to represent the values. When the suitable option is selected from the drop-down menu then the top 5 to 15 states are viewed.

1. Dashboards and Storyboards related to the project**:**

**Dashboard 1**: Product wise analysis

Story: This dashboard includes filtered product-wise analysis of various charts which are based on different values in each chart. Those are product to sales, profit, TotalCost, Counts of profits.

**Dashboard 2**: Product wise analysis with sales and profit values and representing Dashboard Device Designer

Story: This dashboard includes various values from different charts and are incorporated into a dashboard and the device preview is changed and the device type is changed to Tablet view and the device model is changed.

**Dashboard 3**: State wise profit visualization using web page.

Story: This dashboard contains charts representing state wise profit visualization using web page. Combined filter is used and when the state name in different charts is clicked then corresponding Wikipedia page is opened.

**Dashboard 4**: Product-wise profit and sales dashboard.

Story: This dashboard includes charts that are plotted based on the profits and sales values and a combined filter is used to represent the charts in this dashboard.

Please refer to the attached Tableau file for the detailed representation of Dashboards and storyboards.

1. Overall conclusion**:**

The conclusion of this project is to visualize the projected profit margin of different products, comparing state wise profit, sales and number of units sold, simplified and analytical representation of all these values which can be easily understood not only by the analysts, but also by the end users. In the industry level such analysis is mandatory to analyze the production or cost value associated with each product, so that the manufacturing companies meet their required goals.

1. Links and References**:**

Data Source: <https://www.kaggle.com/datasets/mallerakesh/mobile-sales-dataset>

Introduction: <https://www.tableau.com/learn/articles/data-visualization>

University Logo: https://www.bestcollegesonline.org/most-affordable/online-mba-human-resources/northwest-missouri-state-university-top-50-most-affordable-mba-in-human-resources-online-programs-2019/