Global Sales Data Analytics using IBM Cognos

PROJECT REPORT

Submitted by

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in partial fulfillment for the award of
the degree of

BACHELOR OF TECHNOLOGY

in

PROGRAM OF STUDY

SCHOOL OF COMPUTING SCIENCE AND ENGINEERING

VIT BHOPAL UNIVERSITY

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JUNE 2022

INTRODUCTION

OVERVIEW

Shopping via the internet is currently in vogue. Because of COVID, it's difficult to stroll into a store and buy whatever you want. So, try to grasp a few concepts such as this Global Super Store's customer analysis and product analysis.
It has 24 columns and 51291 rows.

The data we worked with had the following characteristics:

Order ID	Tells the unique order ID of the products
Order Date	Date on which the item was ordered
Ship Date	Date on which the item was shipped for delivery
Ship Mode	Way of shipping products
Customer ID	Unique ID assigned to each customer

Custom er Name	Name of the customer
Segment	Segment refers to the type of customer, container volume, loyalty, seasonality, decision maker, the industry of shipper, cargo characteristics, container type, destination region and export/import.
City	Name of the city to which the product is ordered
State	Name of the state to which the product is ordered
Country	Name of the country to which the product is ordered

PURPOSE

To make data visualisation charts like the ones shown below, follow these steps:

1) Sales, Quantity, and Profit by Segment on a Column Graph.
2) Sales by Order Priority and Sales in a Pie Chart
3) Sales by Sub-Category Hierarchy are shown in a TreeMap, and Sales by Region are shown in a Bar Graph.
4) A geographical map depicting the top ten country-by-country sales, color-coded by region.
5) Profit and Sales by Sub-Category on a Line Graph.
6) Sales Analytical Values Across Different Sub-Categories in a Bullet

Chart
7) Scatter Plot of Sales by Profit with Sub-Category Points
8) Regional Sales Forecast in a Line Graph.
9) Month Order Line Graph with Sales and Profit
10) Sales by Sub-Category Box Plot with Segment Key.
11) Ship Mode Sales Bullet Chart

12) Geographical Map of the Top-10 Selling Countries

13) A Radar Graph of Regional Sales by Segment

14) Create a Bar Graph for Sales by Region from a Word Cloud for Country-Wide Sales.
15) Sales, Profit, Quantity, and Discount Summary Graph, as well as a Bar Graph for Sales by Sub-Category.

Using the data visualisations, construct a dashboard and export the analytics

LITERATURE SURVEY

EXISTING PROBLEM

- We may not have enough data to draw appropriate conclusions if we discover strange patterns in our data analysis if our statistical significance is insufficient.

- We won't be able to examine the data prior to generating practical ideas until we conduct data analysis.

- It is worthless without context, and we can't turn data into information without it.

- Information is pointless unless it can be applied to something.

PROPOSED SOLUTION

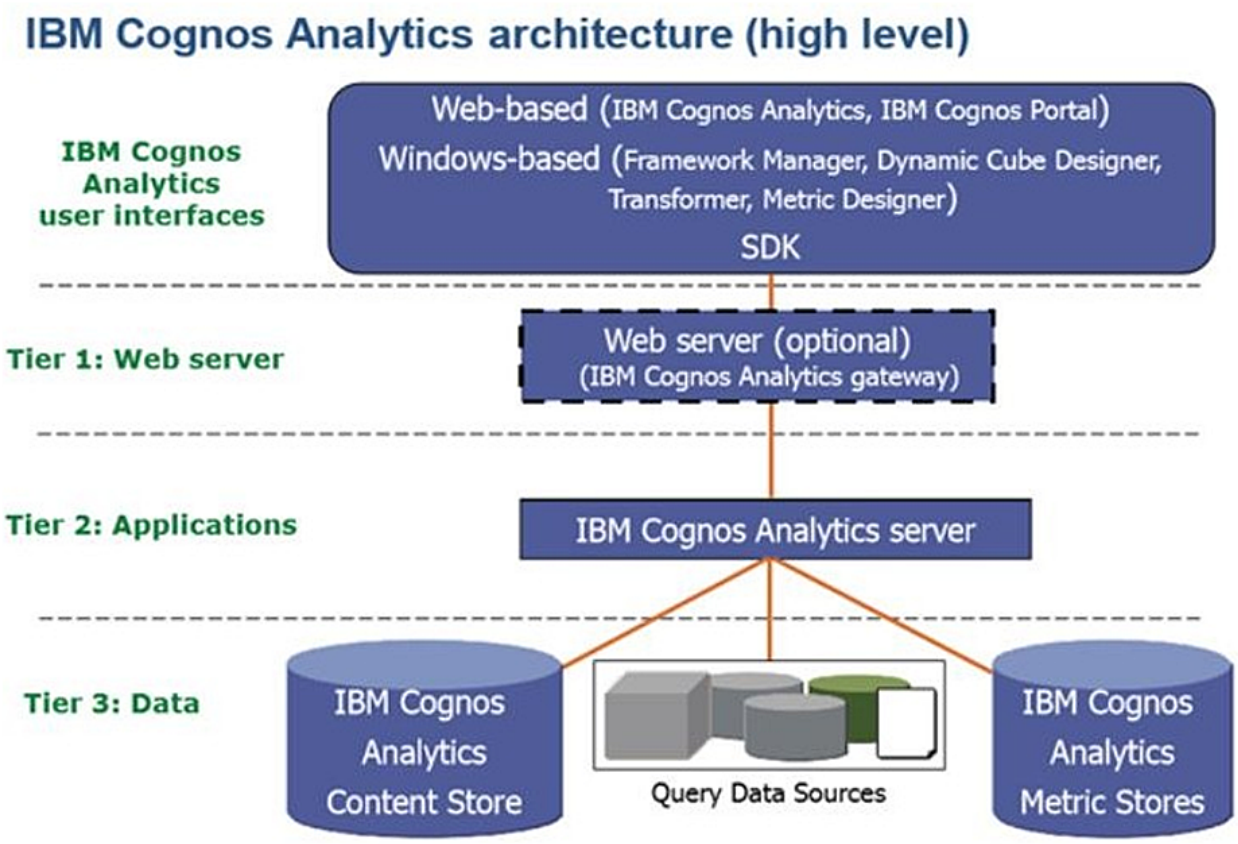
- To use IBM Cognos to produce various data visualisations

- Using IBM Cognos to create a dashboard

- Creating dashboards has the potential to alter our business's success and satisfaction.

THEORETICAL ANALYSIS

BLOCK DIAGRAM



DATA PREPARATION

- We've added a new column called Year Order, which contains the year of the Order Date.

- We've added a new column called Month Order, which contains the month of the Order Date.

- We've created a new column called Day Order in which we've taken the Order Date's Day.

- We've created a new column called Min Sales Range, in which we've taken 80% of the sales.

- We've created a new column called Middle Sales Range, where we've taken 90% of the sales.

- We created a new column called Max Sales Range, in which we took 120 percent of the sales.

- We created a new column called Target Sales Range, in which we took 110 percent of the sales.

HARDWARE-SOFTWARE DESIGNING

#Hardware:-

- HP Laptop 14s-dk0xxx is my laptop.
- My laptop has 8 GB of RAM.
- My laptop's internal memory is 512 GB SSD.

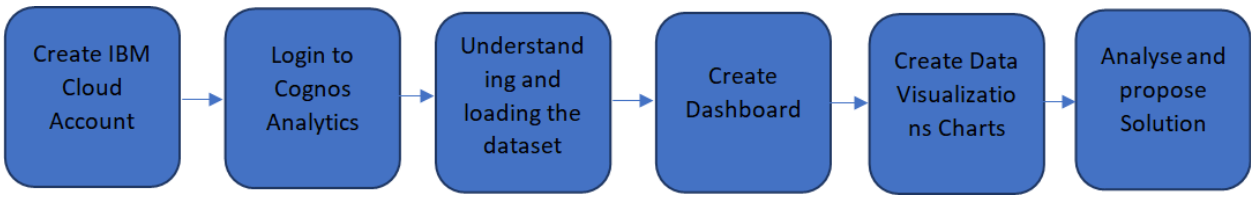
Software:-

- IBM Cognos Analytics was used by us.

EXPERIMENTAL INVESTIGATION

- Data Preparation checking and clearing all the null values
- Doing calculations
- Calculation of Order_Year includes Year(Order_Date)
- Calculation of Order_Month includes Month(Order_Date)
- Calculation of Order_Day includes Day(Order_Date)
- Calculation of All includes All
- Calculation of Target Sales includes Sales*1.10
- Calculation of Min Sales Range includes Sales * 0.80
- Calculation of Middle Sales Range includes Sales * 0.90
- Calculation of Max Sales Range includes Sales * 1.20

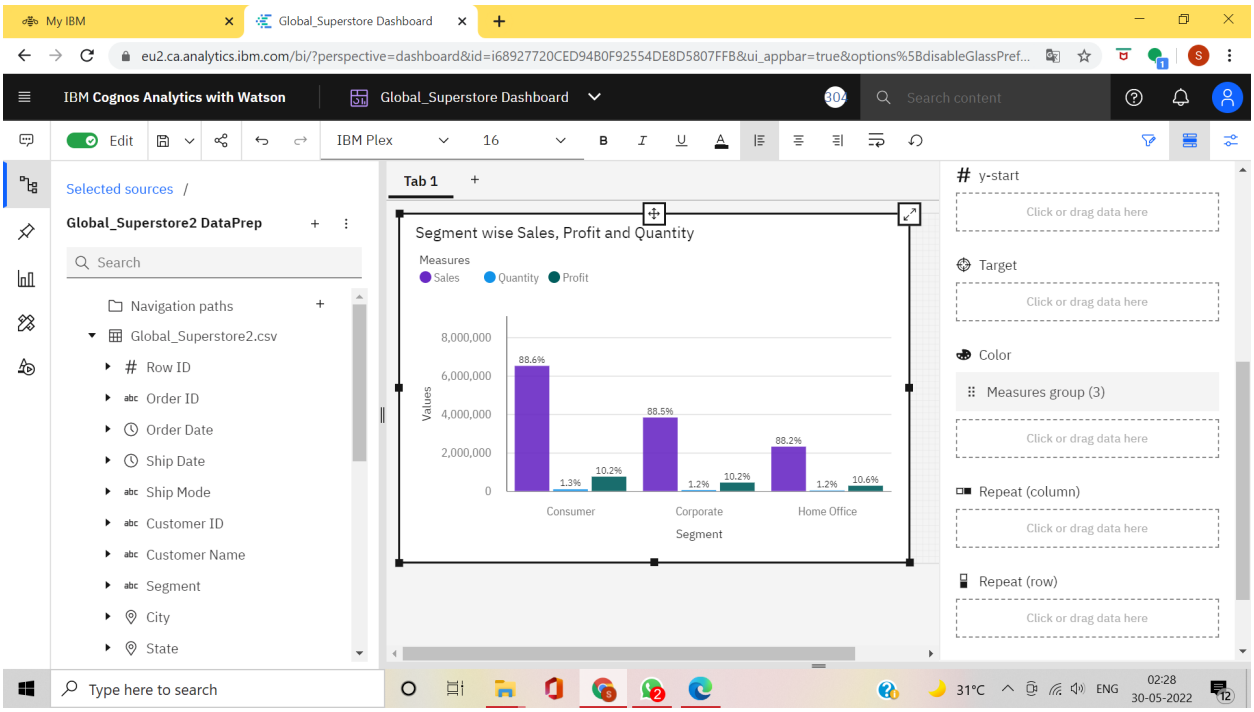
FLOWCHART



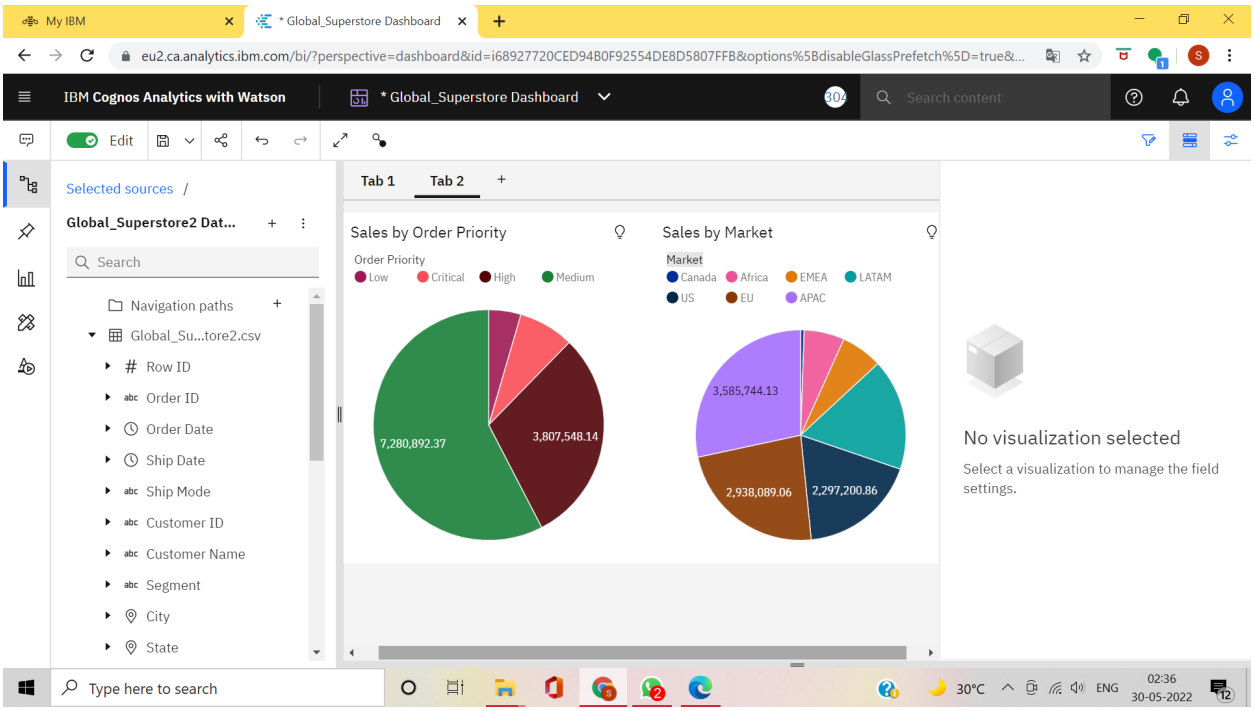
RESULT

1. We've used Sales, Quantity, and Profit as Lengths and Segment as Bars

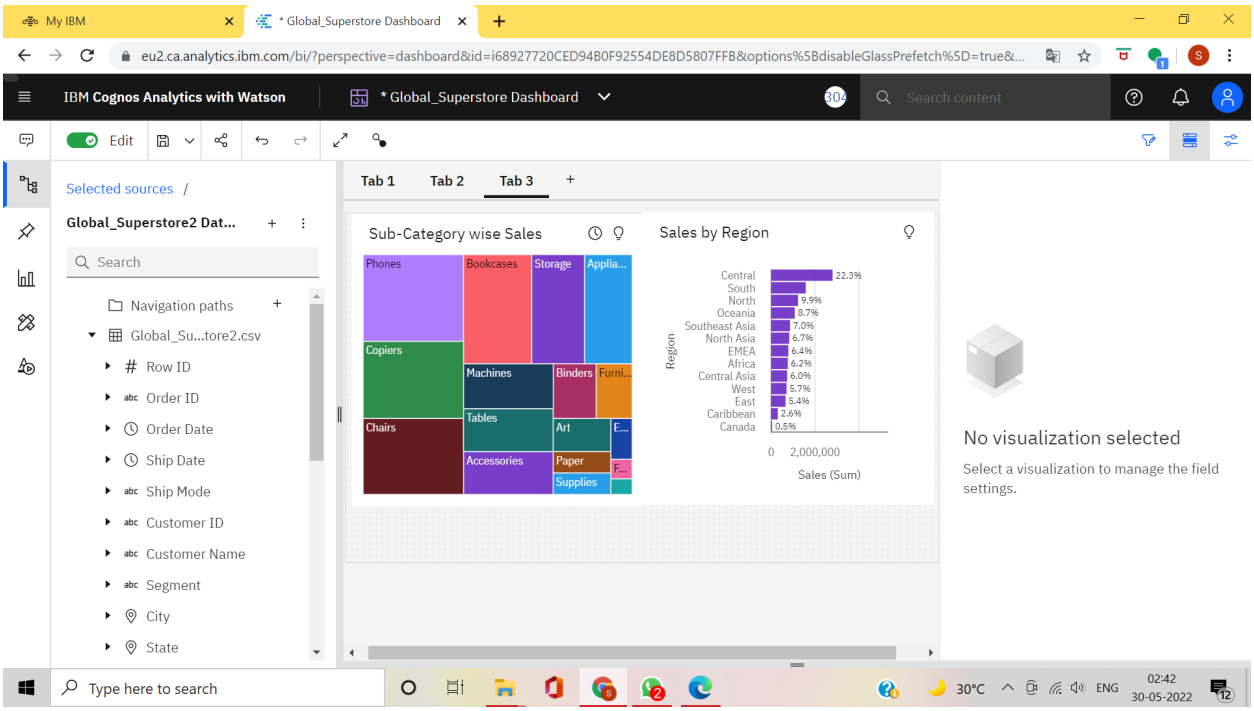
in our column graph.



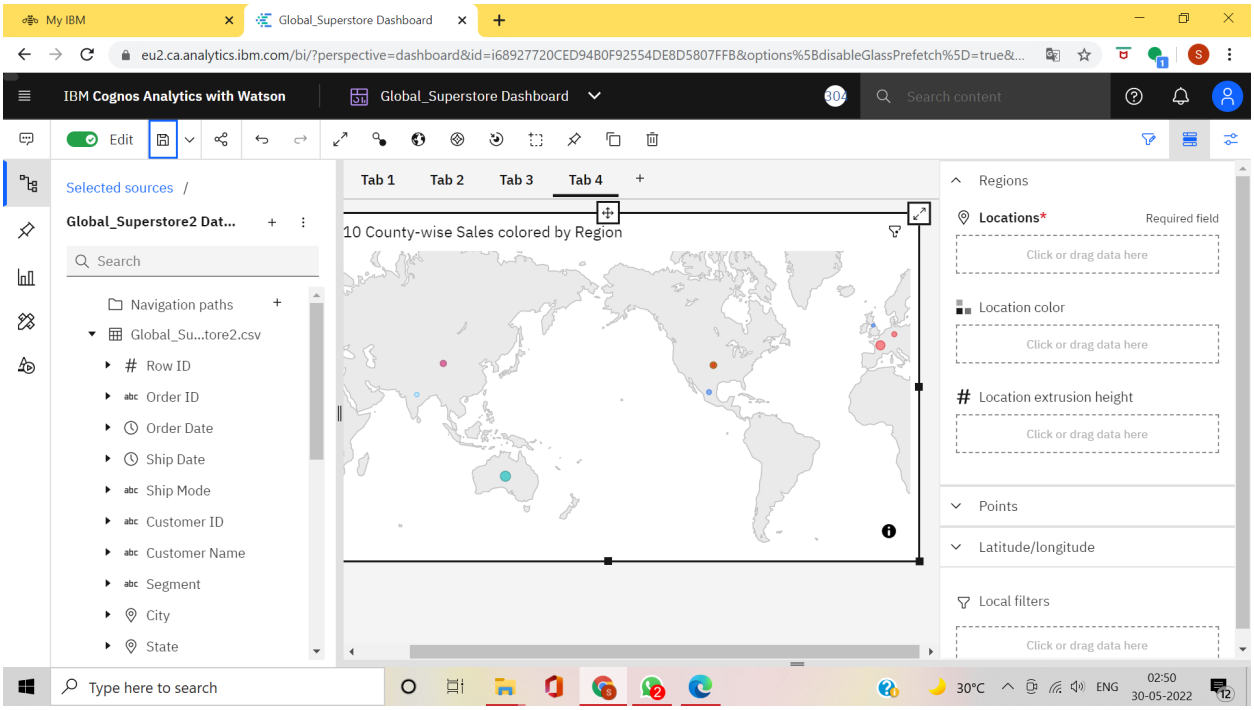
2. We used Order Priority as a segment and Sales as a size in the left Pie Chart, and Market as a segment and Sales as a size in the right Pie Chart.



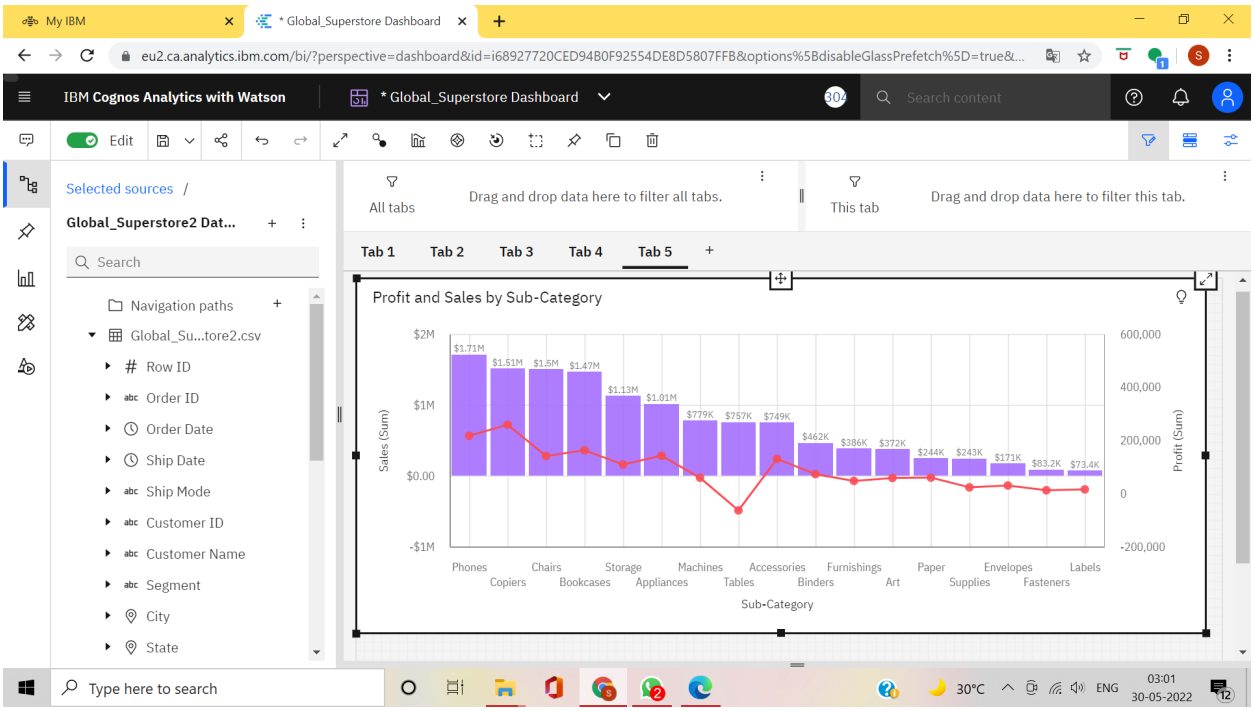
3. We used Sub-Category as Area Hierarchy and Sales as Size in the Tree Map below, and we used Region as Bars and Sales as Length in the Bar Graph.



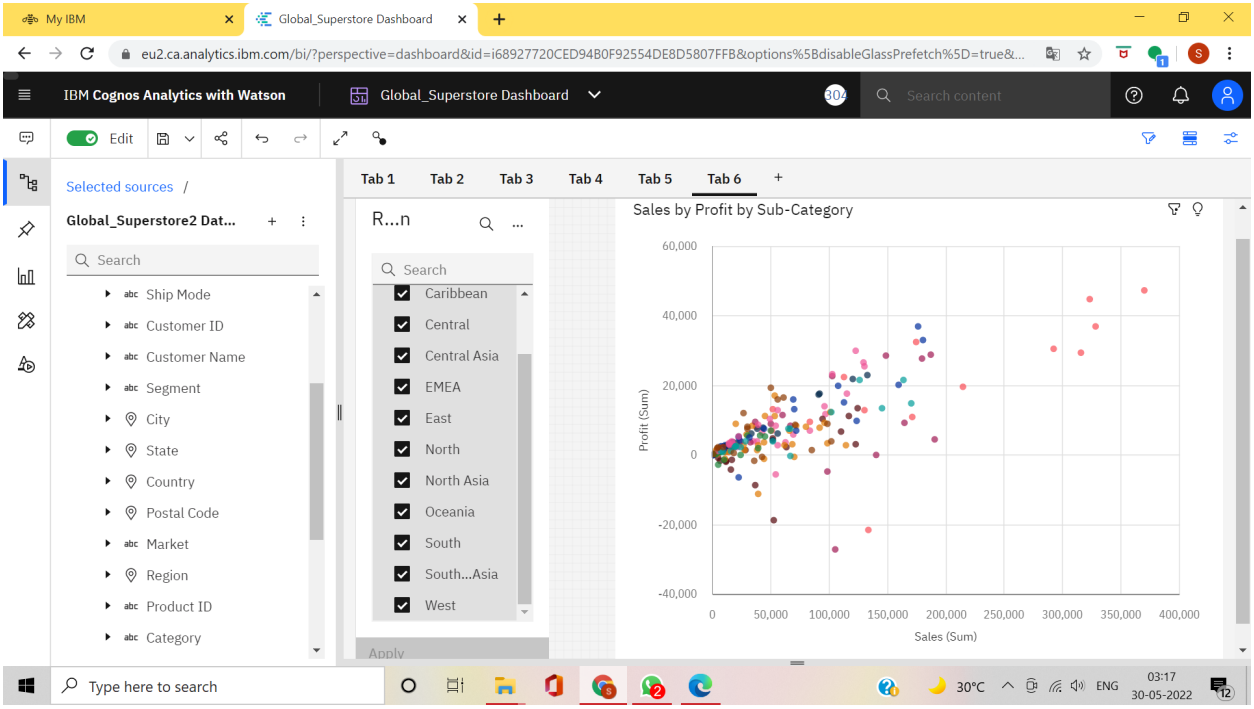
4. The Top 10 Country-by-Region Sales are shown in the Map Chart below.



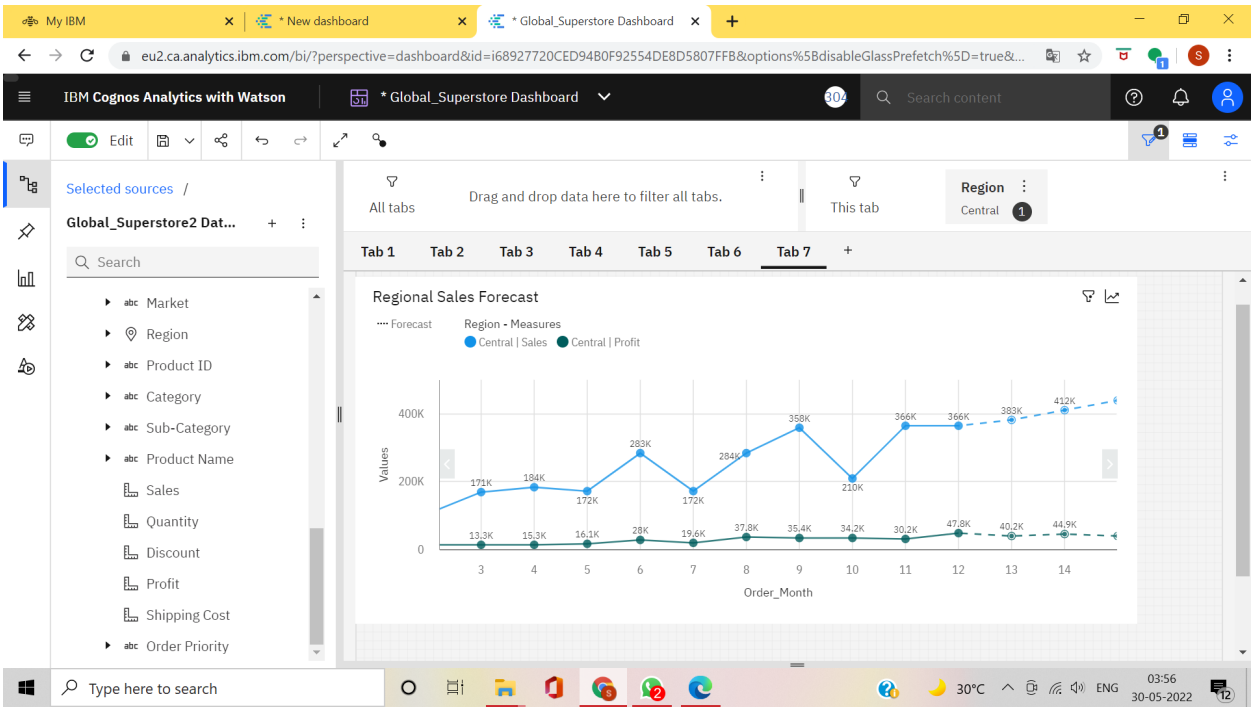
5. We have Sub-Category on the x-axis, Sales as Column Length, and Profit as Line Position in the Line Graph below.



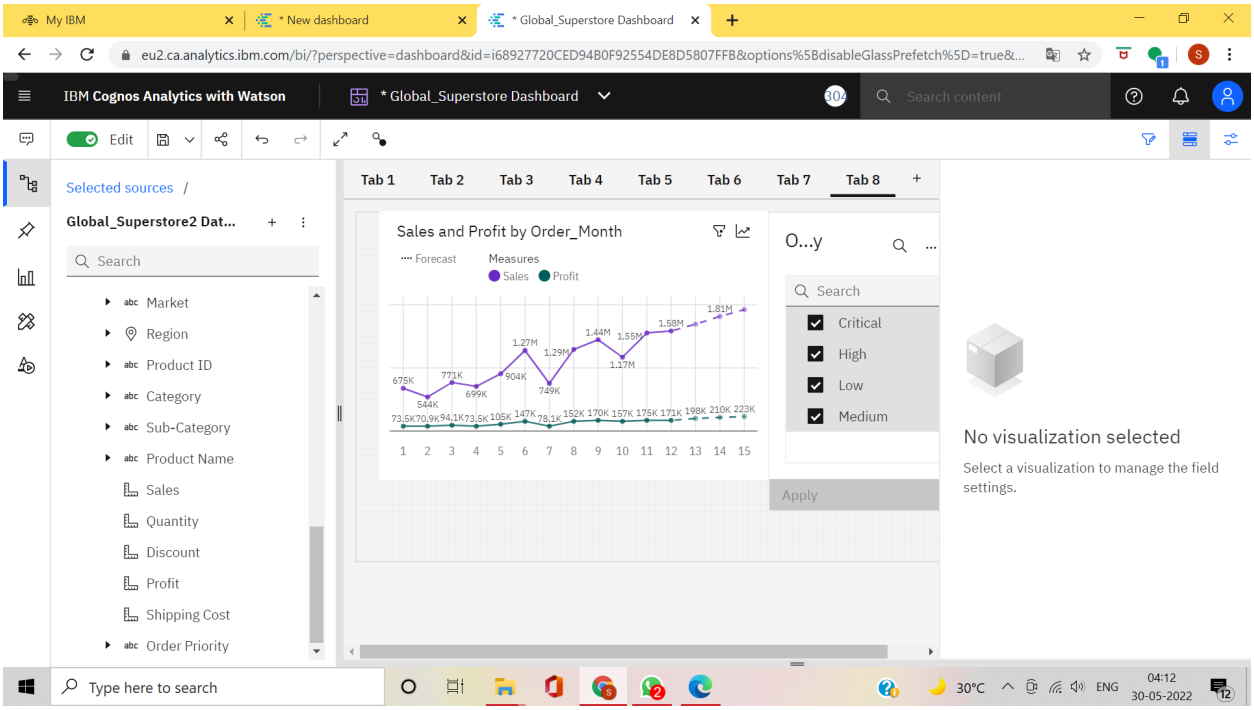
6. We have Sub-Category as Points, Sales on the x-axis, Profit on the y-axis, and Region as Color in the Scatter Plot below.



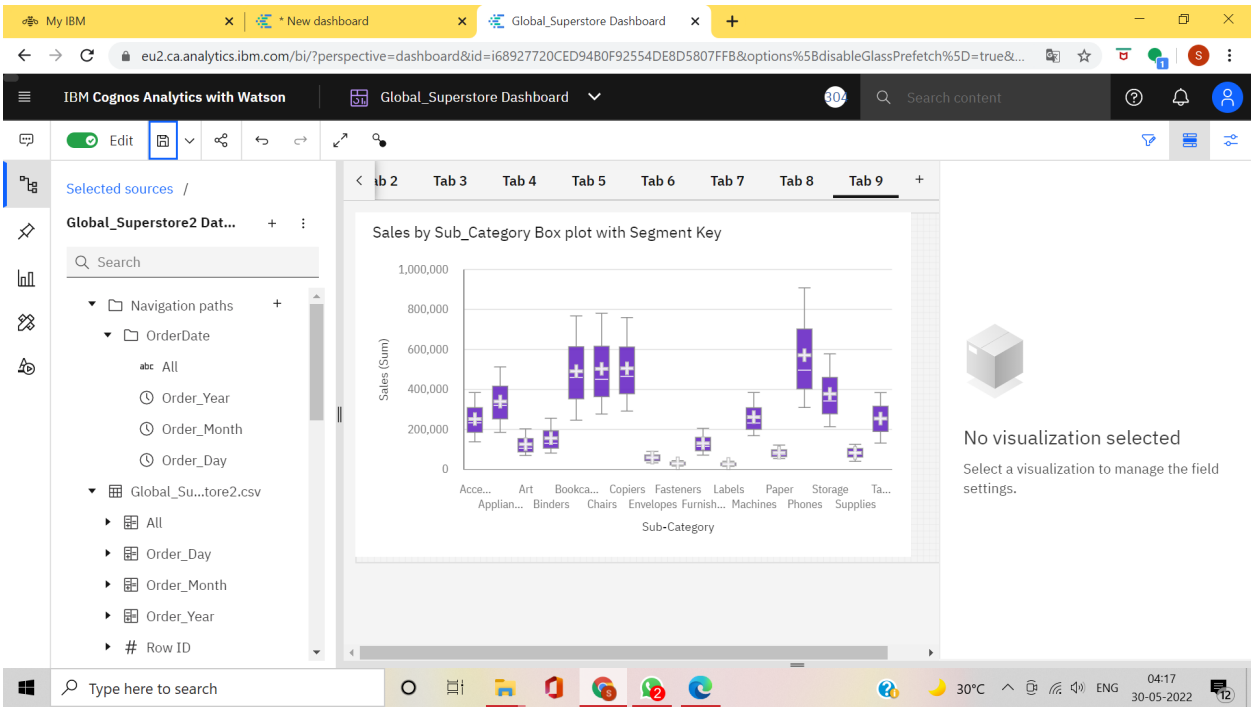
7. We have Month Order in the x-axis, Sales and Profit in the y-axis, and Region as Color in the below Line Graph. In the Region Dashboard, we have several Geographical Regions from which we may choose more than one to examine the Sales and Profit of that specific Region.



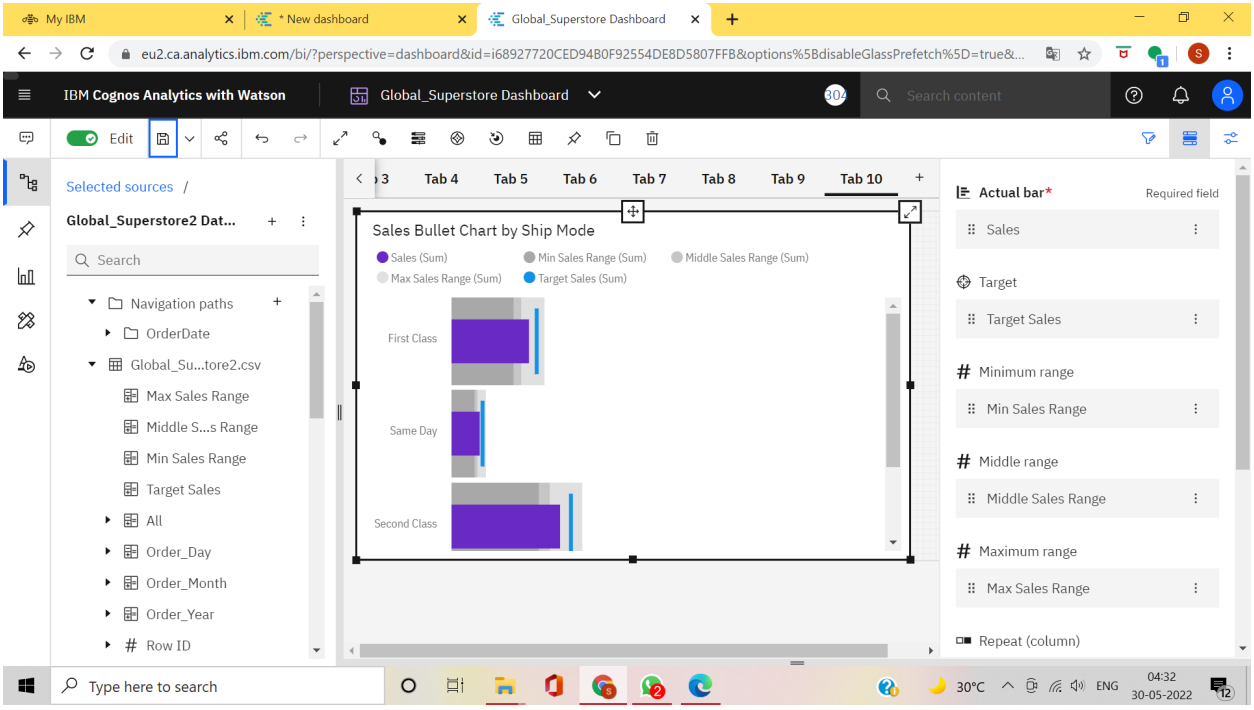
8. We have Month Order in the x-axis, Sales and Profit in the y-axis, and Critical,High,Low,Medium options in the Order Priority dashboard, from which we may choose more than one to examine the Sales and Profits of a product dependent on its Order Priority.



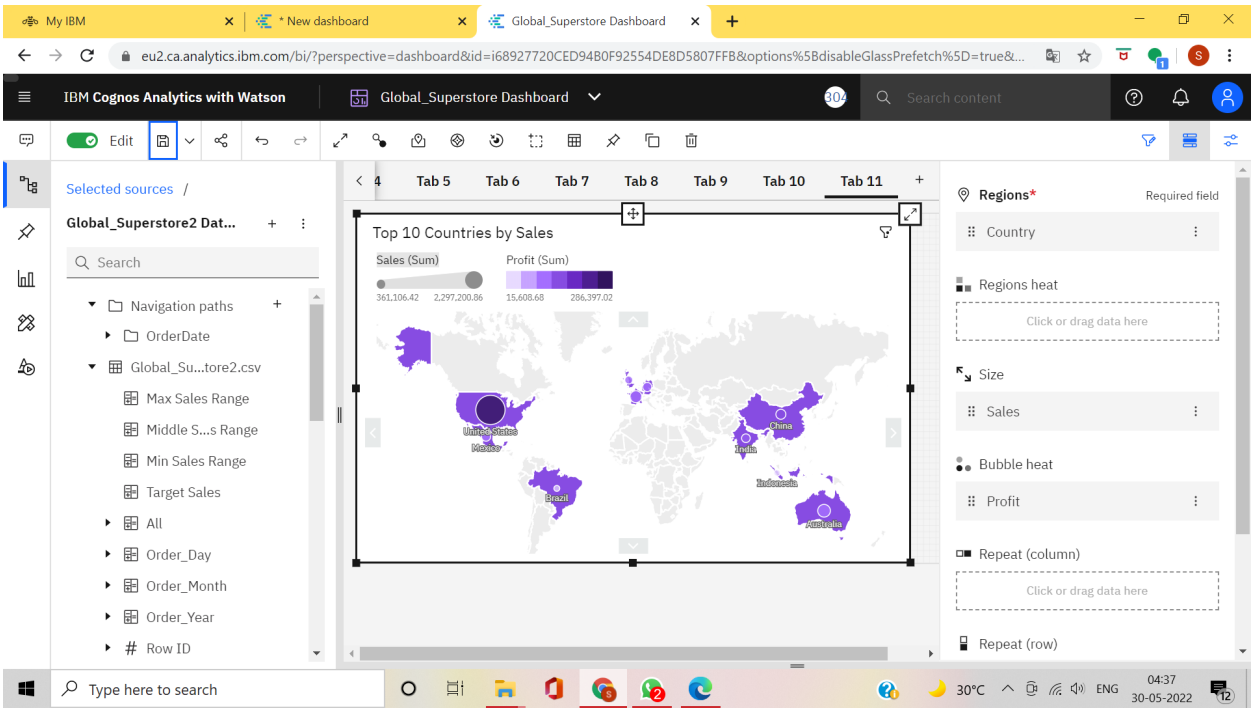
9. We used Sub-Category as the x-axis, Sales as the y-axis, and Segment as the key in the Box plot below.



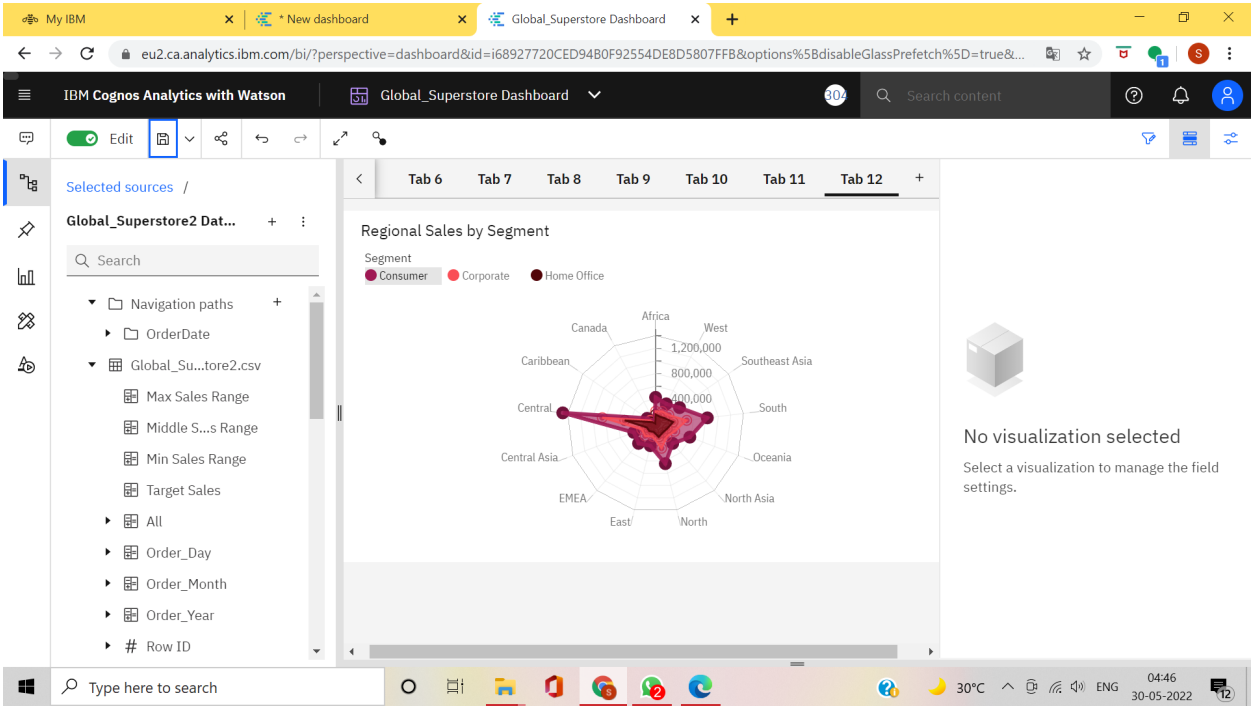
10. We've used Sales as the actual bar, Target Sales as the target, Min Sales Range as the minimum range, Middle Sales Range as the middle range, and Max Sales Range as the maximum range in the below Stacked Bar Graph.



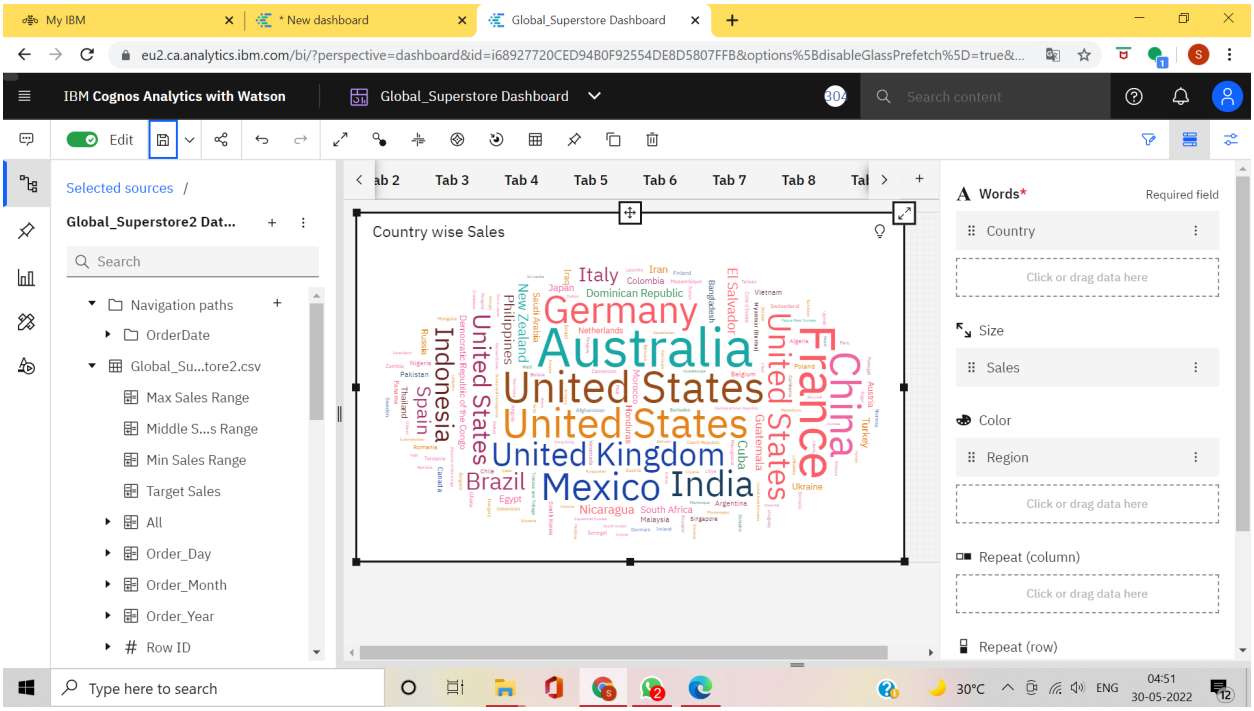
11. In the Legacy map graph below, we've used Country as a region, Profit as a heat, and Sales as a size.



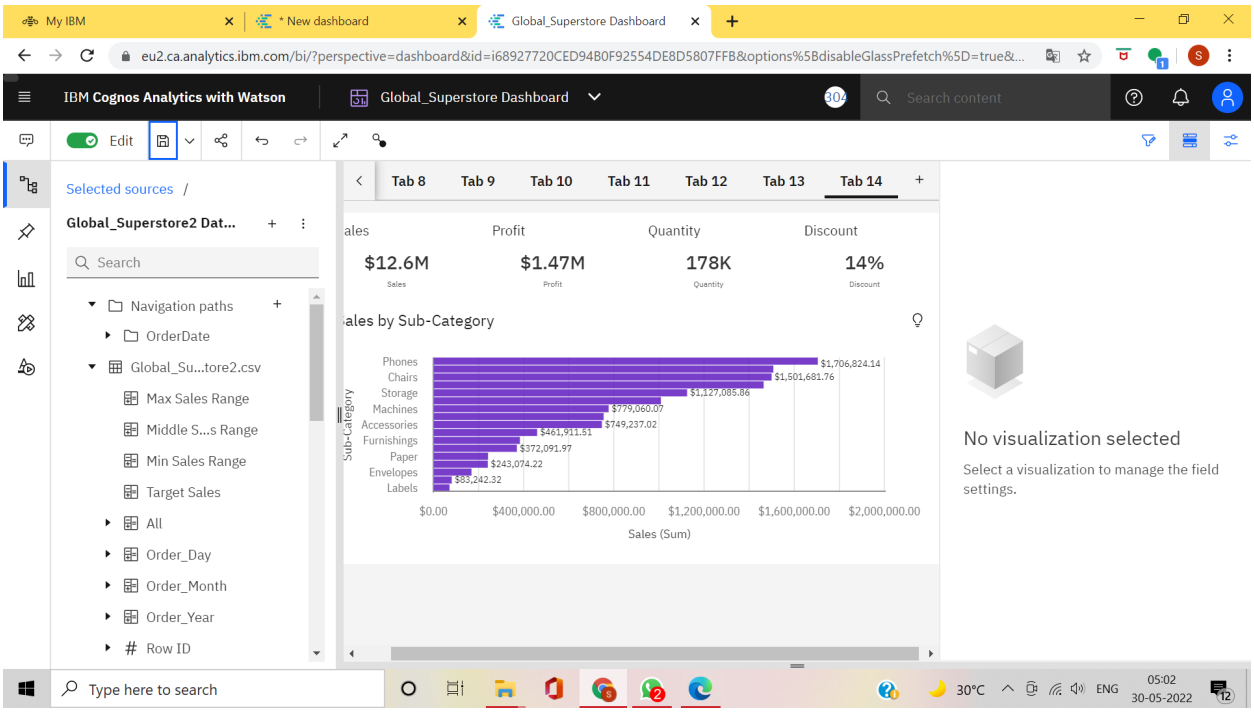
12. We used Region as the x-axis, Sales as the y-axis, Segment as the colour, and Category as the Repeated Column in the Radar Graph below.



13. We used Country as words, Sales as size, and Region as colour in the below left Word Cloud for Country-Wise Sales.



14. Four summary graphs are shown in the image below. The first Summary Graph depicts the Sales Value, while the second depicts the Profit Value, the third depicts the Quantity Value, and the fourth depicts the Discount Value. Below them is a Bar Graph in which Sub-Category is represented by bars and Sales is represented by length.



ADVANTAGES AND DISADVANTAGES OF CREATING DASHBOARD

ADVANTAGES

- Enhanced Visibility: Dashboards give organisations more visibility and make information available whenever they need it, allowing them to better respond to changing market conditions.

- Time-saving Efficiency: We no longer waste time generating reports from numerous systems thanks to dashboards. Instead, data is extracted from a source and presented as a simple visual overview.

- Better Forecasting: With more data knowledge, future demand may be predicted more accurately utilising historical data. For increased success, businesses can better plan for demand changes by creating measurable targets and deliverables.

- Better Decision Making: A dashboard allows firms to analyse crucial data quickly and thoroughly, whether they're providing reporting and analysis for the entire organisation or certain functional areas of the business. Visualised interactivity helps to convey large volumes of data in a simple and understandable manner. Better business decisions can be made with the capacity to quickly discern what the data really means.

DISADVANTAGES

- Users attempting to incorporate too much information without comprehending restrictions or evaluating their individual demands from the spectrum of different measurables detailed data analysis provides, resulting in a flashy or cluttered design.

- The technology used to create dashboards is different from other software solutions already in use in organisations, and it can be difficult to grasp at first.

- The use of dashboard metrics in the company is not governed by any established norms or hierarchy. This means that each person can interpret the measurements in their own unique way, resulting in a wide range of data being reported.

APPLICATIONS

- If you handle complex campaigns, you'll likely end up with many analytics solutions for each platform and the necessity to consult them independently, obstructing your overall picture. Rather, the dashboard shows data from several sources, such as site analytics and social media indicators. This makes it much easy to compare them and track their progress.

- You don't need to be an analytics expert to understand a decent dashboard because it plainly displays a lot of crucial metrics. You always have the option of using more specific tools to go deeper into a particular data collection.

- You can create different users so that your complete team can view the same information from wherever if you synchronise your dashboard automatically in the cloud. The dashboard can even be projected onto a screen in your office so that everyone can see what's going on in real time.

- A unified dashboard can help you save a lot of time. Dashboards perform all the work for you instead of you having to collect data from various sources and create charts on your own. All you have to do now is spend some time setting up the metrics and deciding how to present them. The reports are generated automatically after that.

CONCLUSION

We were able to accomplish the following goals as a result of this project:

Multiple analysis charts and graphs were created.

Dashboard was created using the analysed chart.

In IBM Cognos Analytics, I saved and visualised the final dashboard.

FUTURE SCOPE

Other charts that can be made include:

With respect to the Year Order and Day Order columns.

With respect to the Market and Shipping Costs columns.