Global Sales Data Analytics using IBM Cognos

A PROJECT REPORT

Submitted by

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INTRODUCTION

OVERVIEW

Shopping online is currently the need of the hour. Because of this COVID, it's not easy to walk in a store randomly and buy anything you want. So, try to understand a few things like, Customer Analysis and Product Analysis of this Global Super Store.
It has 51291 Rows and 24 Columns

The data we worked on had the following features:

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

Customer 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 create data visualization charts like those mentioned below:

1) Column Graph Showing Sales,Quantity and Profit By Segment.

2) Pie Chart Showing Sales By Order Priority and Sales.

3) TreeMap showing Sales for Sub-Category Hierarchy and Bar Graph showing Sales By Region.

4) Geographical Map showing Top-10 Country-Wise Sales coloured by Region.

5) Line Graph Showing Profit and Sales By Sub-Category

6)Scatter Plot showing Sales by Profit with points for Sub-Category.

7) Line Graph showing Regional Sales Forecast.

8) Line Graph showing Sales and Profit for Month_Order

9) Box Plot showing Sales By Sub-Category with Segment Key.

10) Sales Bullet Chart By Ship Mode

11) Geographical Map for Showing Top-10 Countries By Sale

12) Radar Graph for showing Regional Sales By Segment

13) To Create Word Cloud for Country-Wise Sales a Bar Graph for Sales By Region.

14) Summary Graph for Sales,Profit,Quantity and Discount and a Bar Graph for Sales By Sub-Category.

· To create dashboard using the data visualizations and export the analytics

LITERATURE SURVEY

EXISTING PROBLEM

- If we are finding unusual patterns within our data analysis or our statistical significance is not strong enough, we might not have enough data to make valid conclusions

- Without doing data analysis, we won't get the opportunity to evaluate the data before making actionable plans

- Data is meaningless without context and without context, we cannot turn data into information

- Information is useless without being able to apply to something

PROPOSED SOLUTION

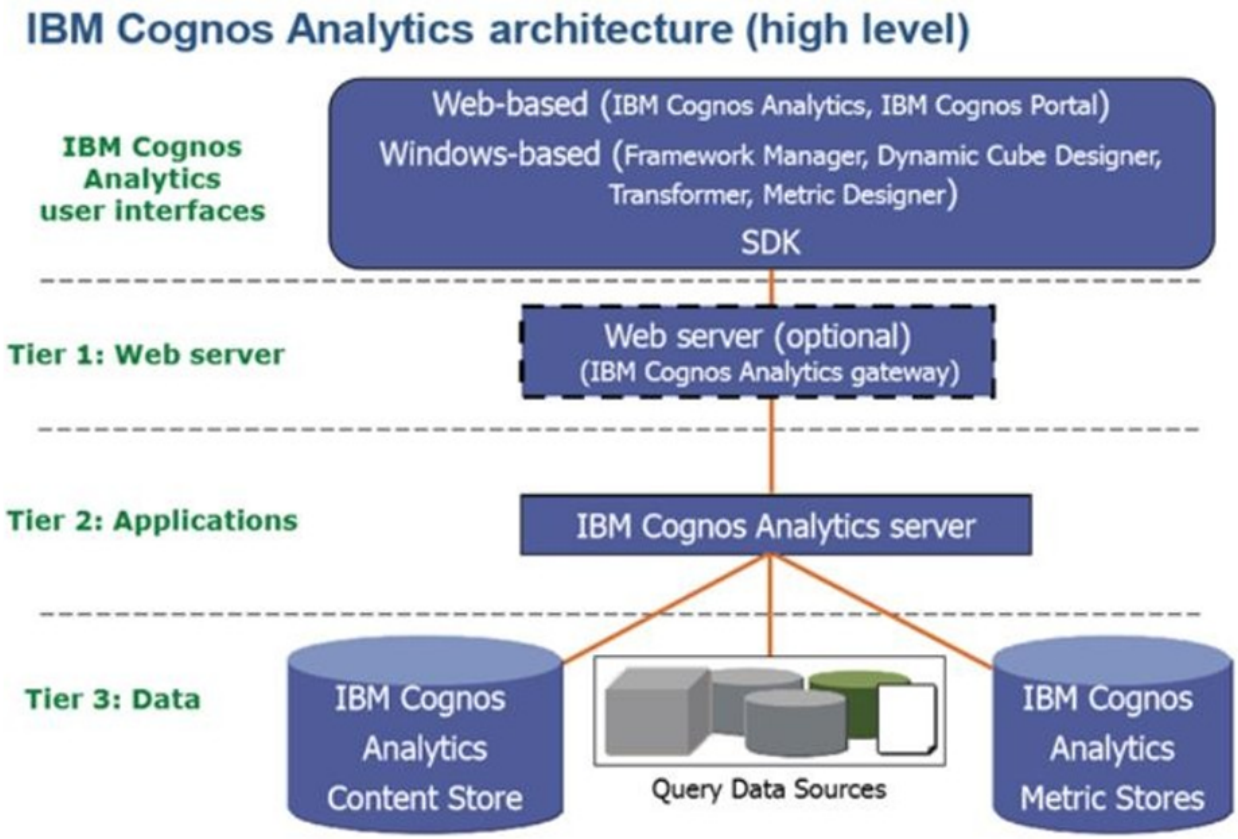
- To create various data visualizations using IBM Cognos

- To make a dashboard using IBM Cognos

· Making dashboards can revolutionize both our success and enjoyment in running our business

THEORETICAL ANALYSIS

BLOCK DIAGRAM



DATA PREPARATION

· Created new column named Year_Order in which we have taken the year of the Order_Date

· Created new column named Month_Order in which we have taken the month of the Order_Date

· Created new column named Day_Order in which we have taken the Day of the Order_Date

· Created new column named Min_Sales_Range in which we have taken 80% of the given sales.

· Created new column named Middle_Sales_Range in which we have taken 90% of the given sales.

· Created new column named Max_Sales_Range in which we have taken 120% of the given sales.

· Created new column named Target_Sales_Range in which we have taken 110% of the given sales.

HARDWARE-SOFTWARE DESIGNING

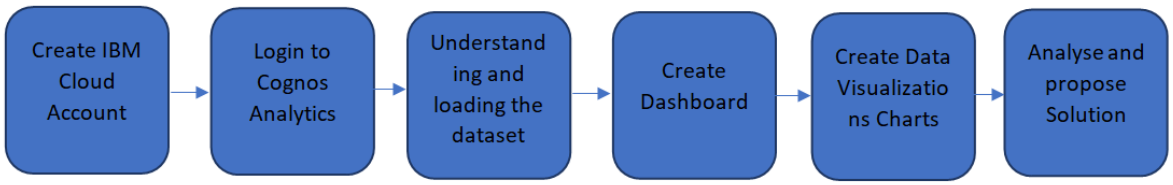
Hardware:-

- My Laptop is ASUS VivoBook X40F
- The RAM of my Laptop is 8 GB
- The Internal Memory of my Laptop is 512 GB SSD

Software:-

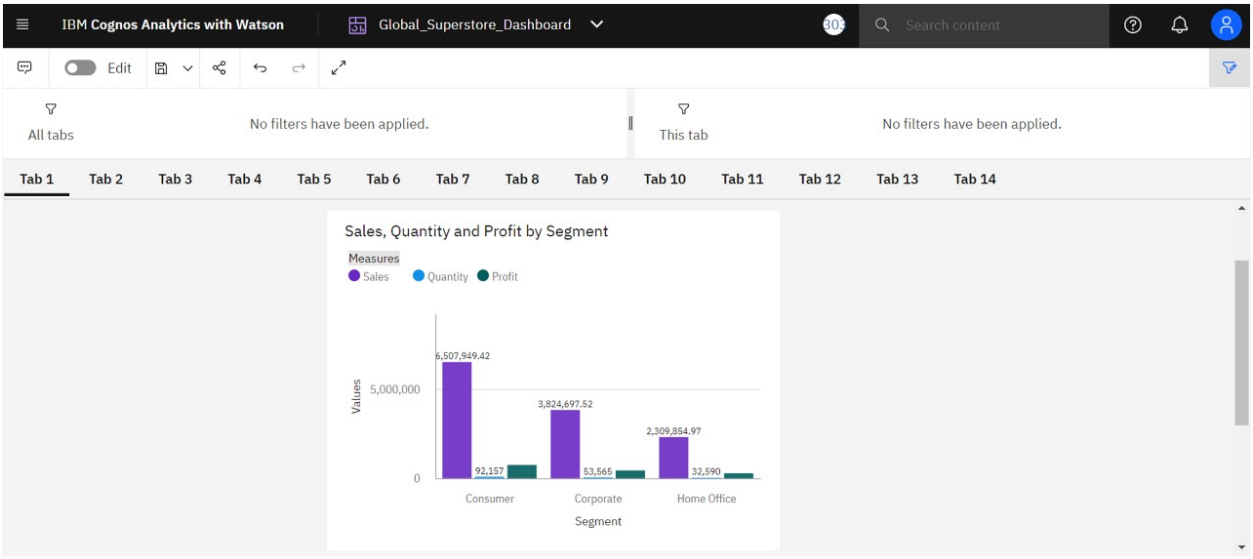
- We have used IBM Cognos Analytics.

FLOWCHART

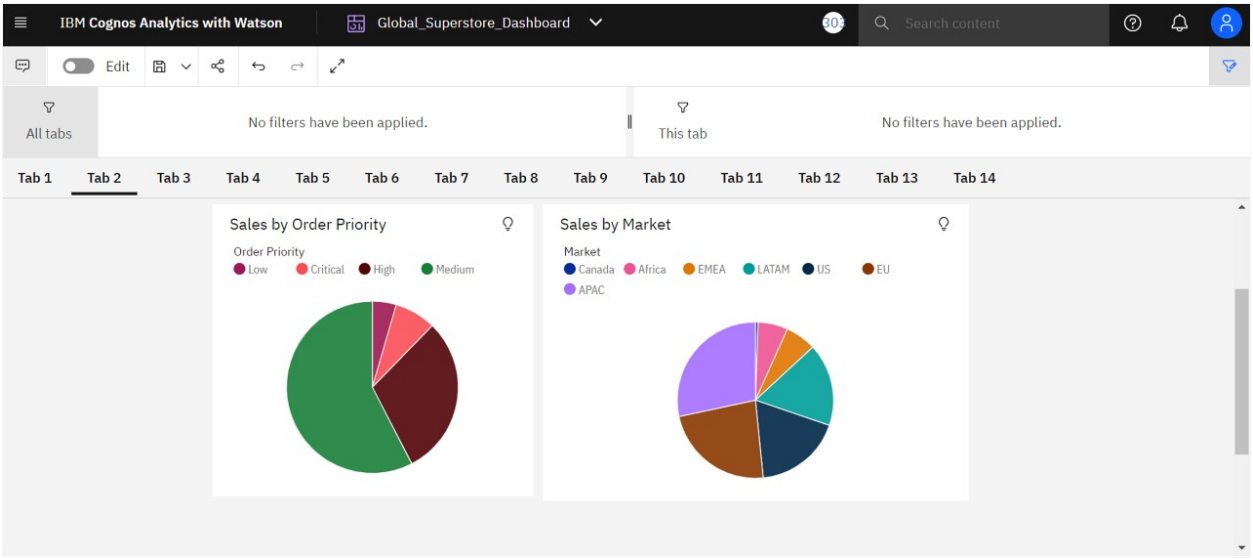


RESULT

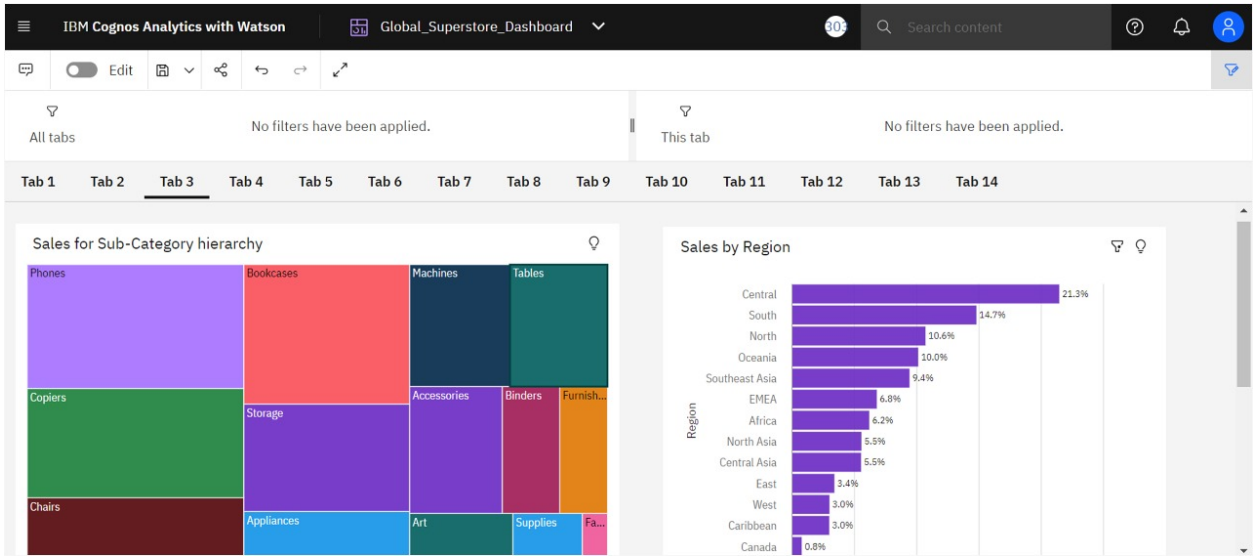
1. In this column graph, we have taken Sales,Quantity and Profit as Length and Segment as Bars.



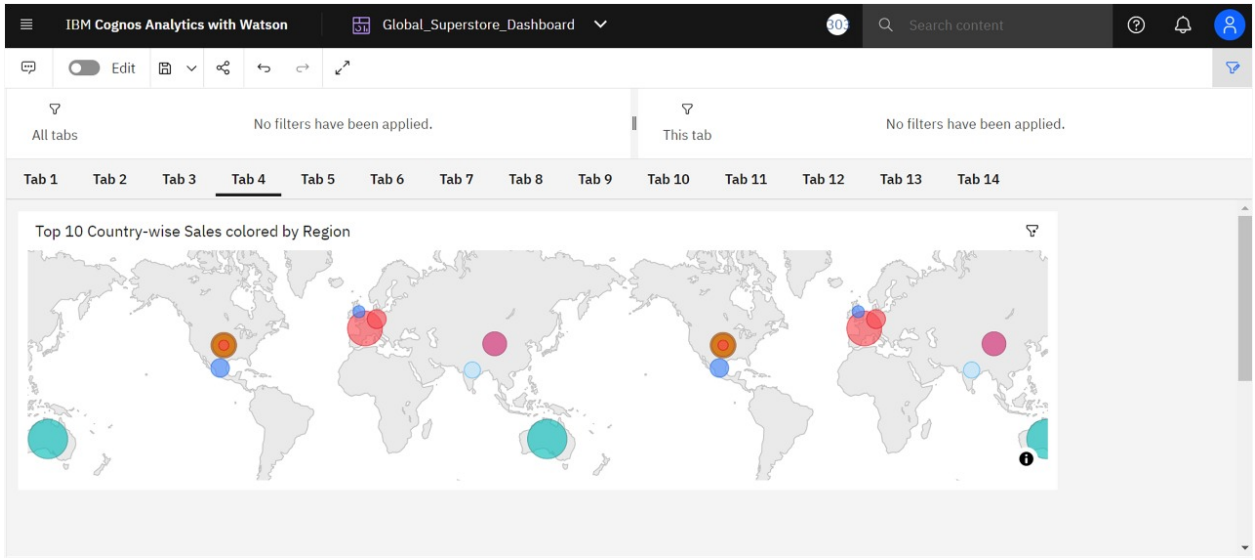
2. In below left Pie Chart, we have taken Order Priority as Segment and Sales as Size and in the right Pie Chart, we have taken Market as Segment and Sales as Size.



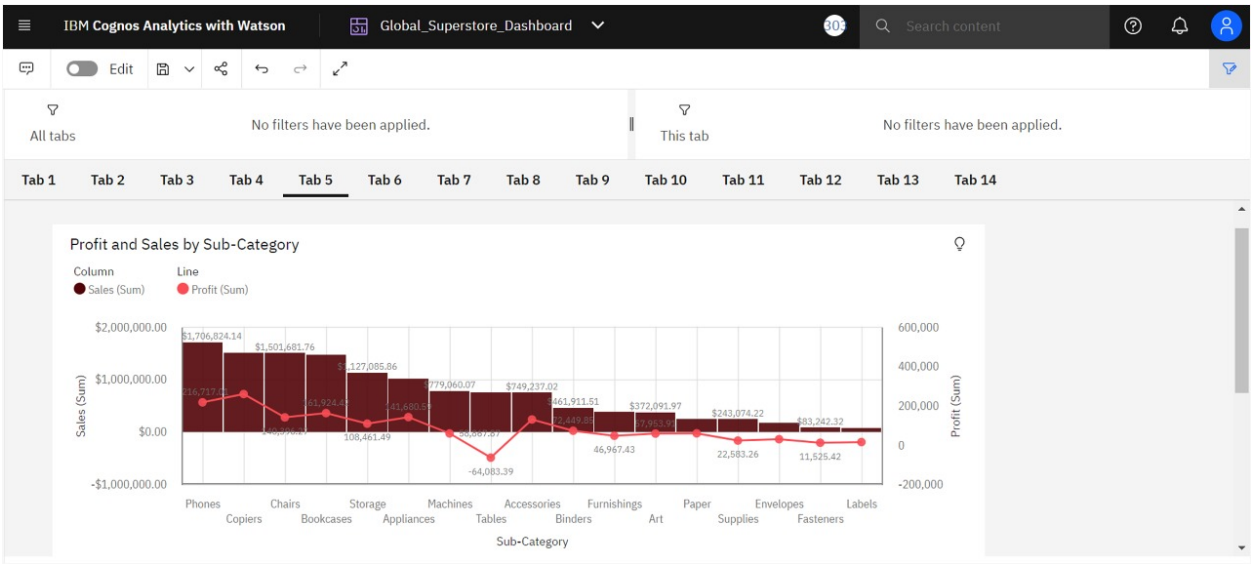
3. In the below Tree Map, we have taken Sub-Category as Area Hierarchy and Sales as Size and in the bar graph we have taken Region as Bars and Sales as Length.



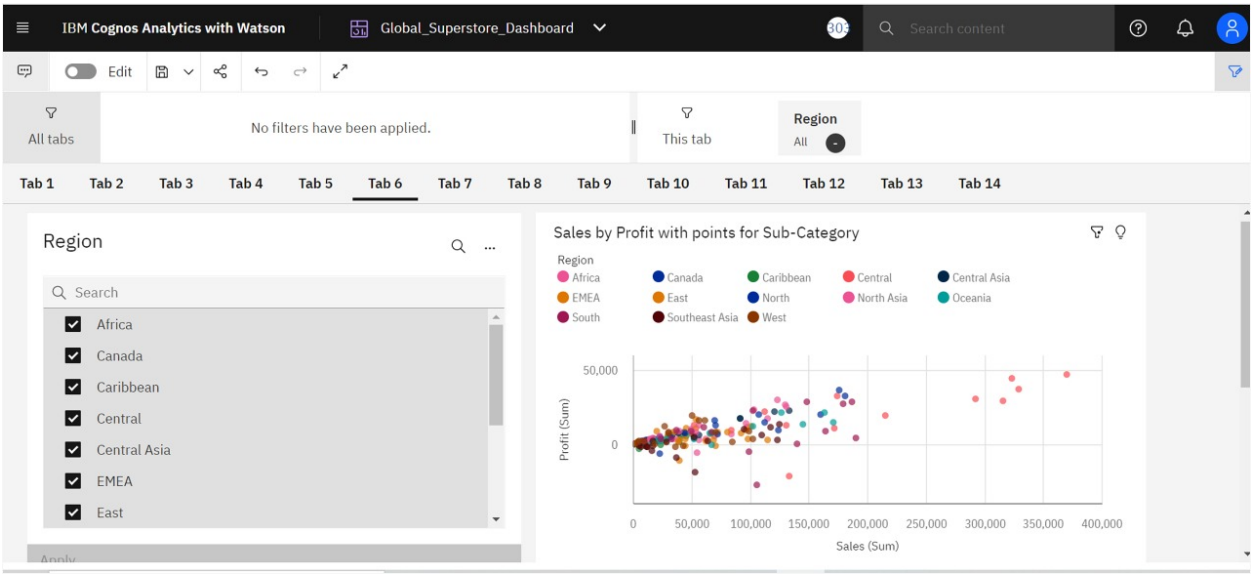
4. In the below Map Chart, we have Top 10 Country-wise Sales by Region



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

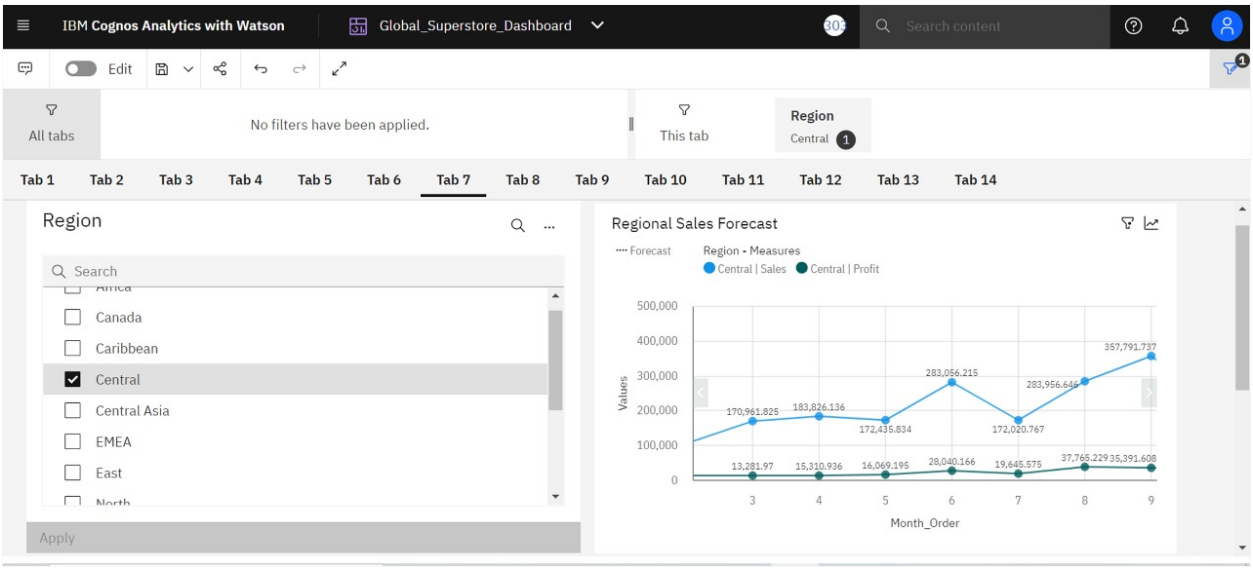


6. In the below Scatter Plot, we have Sub-Category as Points,Sales in x-axis and Profit in y-axis and Region as Colour.

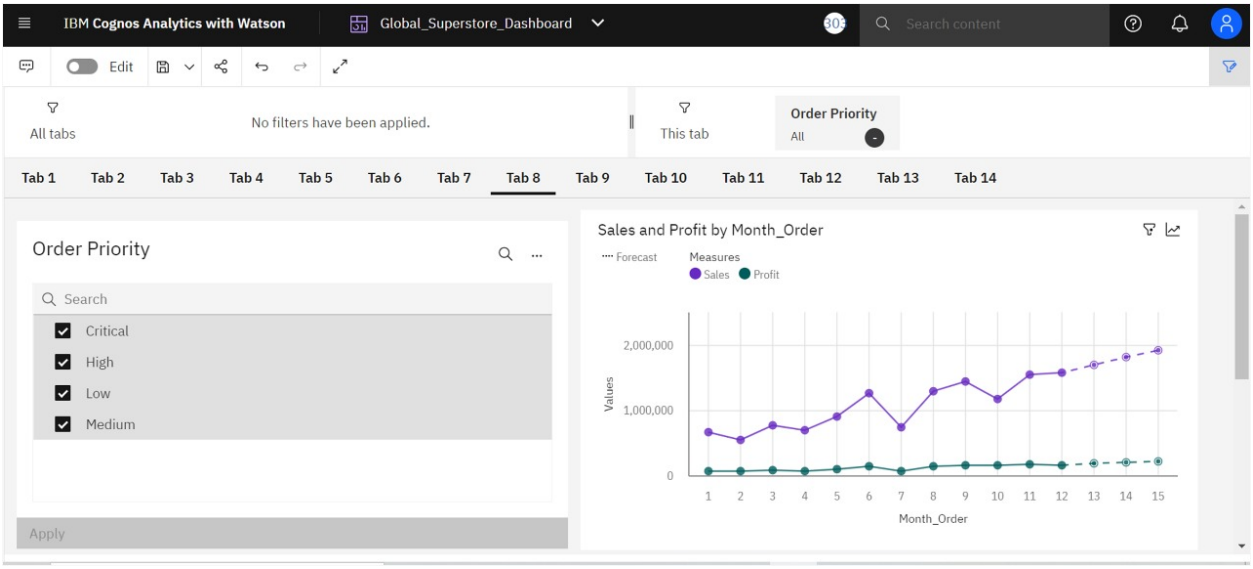


7. In the below Line Graph, we have Month_Order in x-axis,Sales and Profit in y-axis and Region as Color and in the Region Dashboard different Geographical Regions are given from which we can choose more than one to check the Sales and Profit of that particular

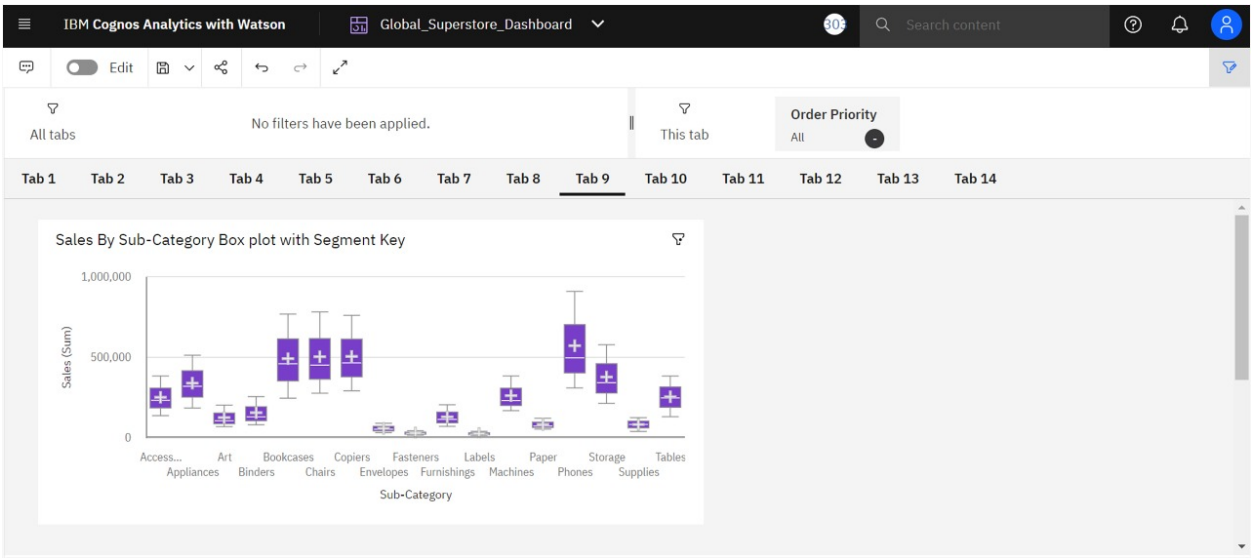
Regions.



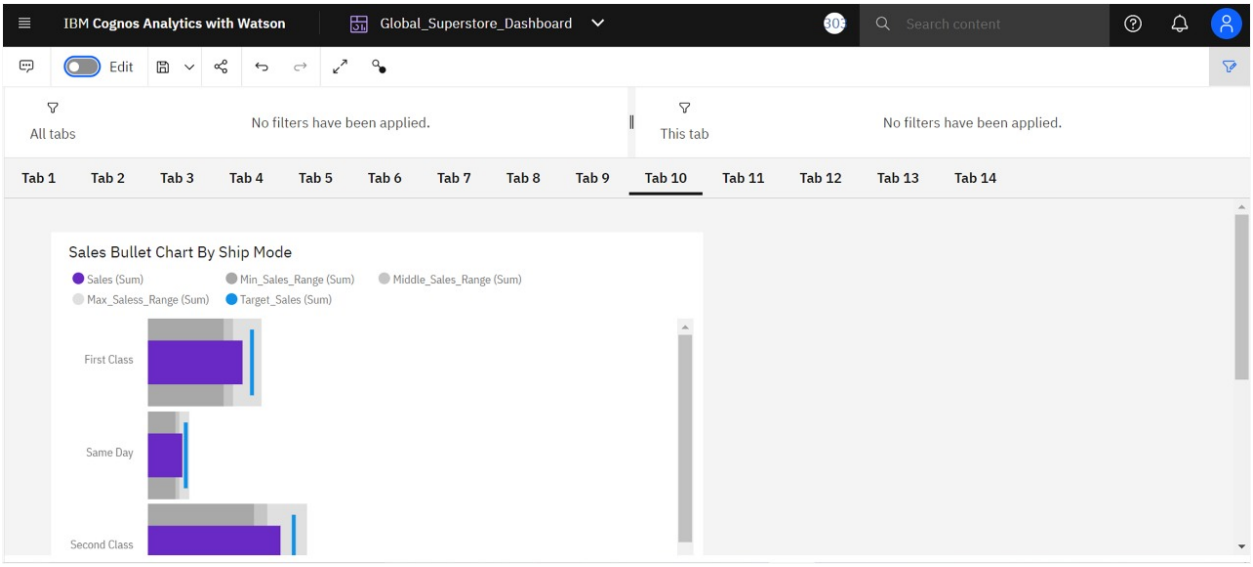
8. In the below Line Graph, we have Month_Order in x-axis, Sales and Profit in y-axis and in the Order_Priority dashboard Critical,High,Low,Medium options are given of which we can choose more than one to see the Sales and Profits of a product based on its Order Priority.



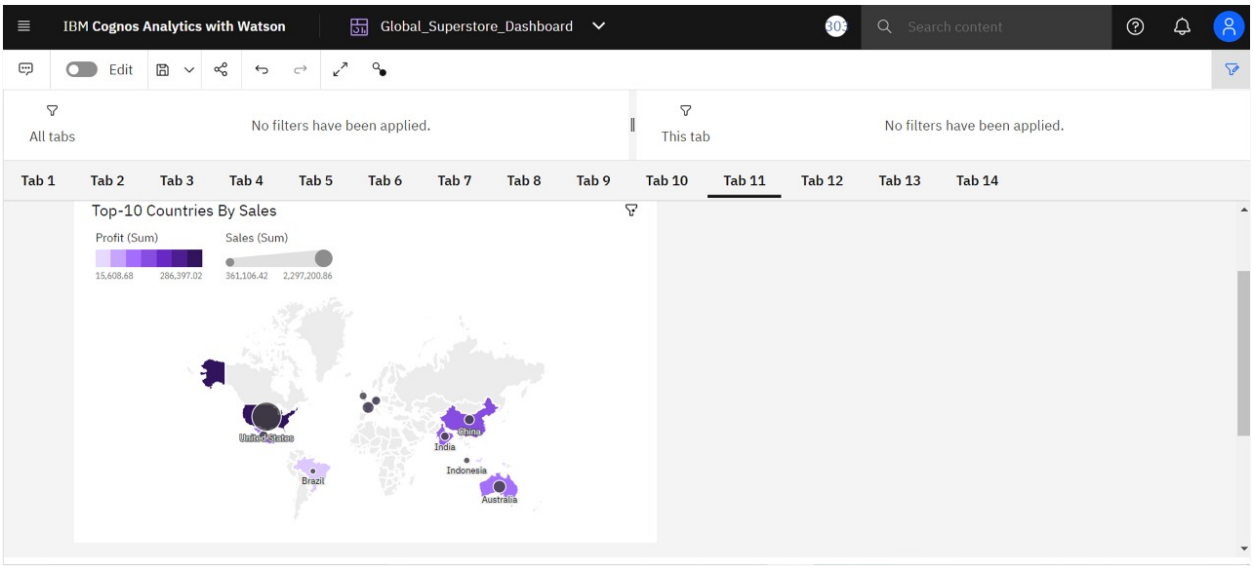
9. In the below Box plot, we have taken Sub-Category as x-axis,Sales as y-axis and Segment as Key.



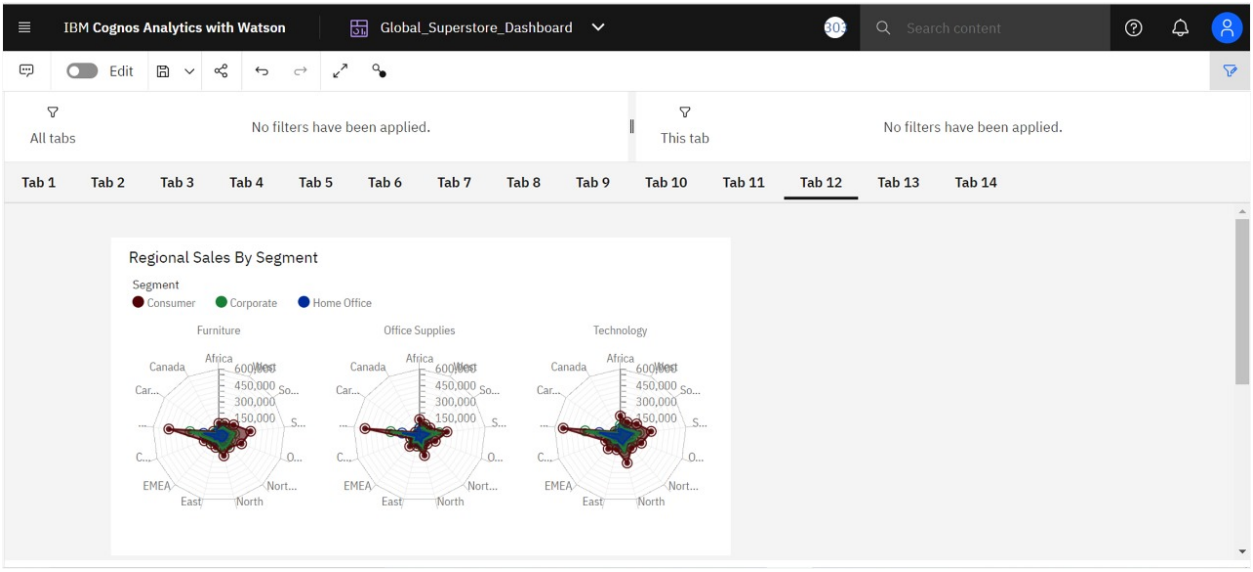
10. In the below Stacked Bar Graph, we have taken Sales as Actual Bar,Target_Sales as Target, Min_Sales_Range as Minimum Range, Middle_Sales_Range as Middle Range,Max_Sales_Range as Maximum Range.



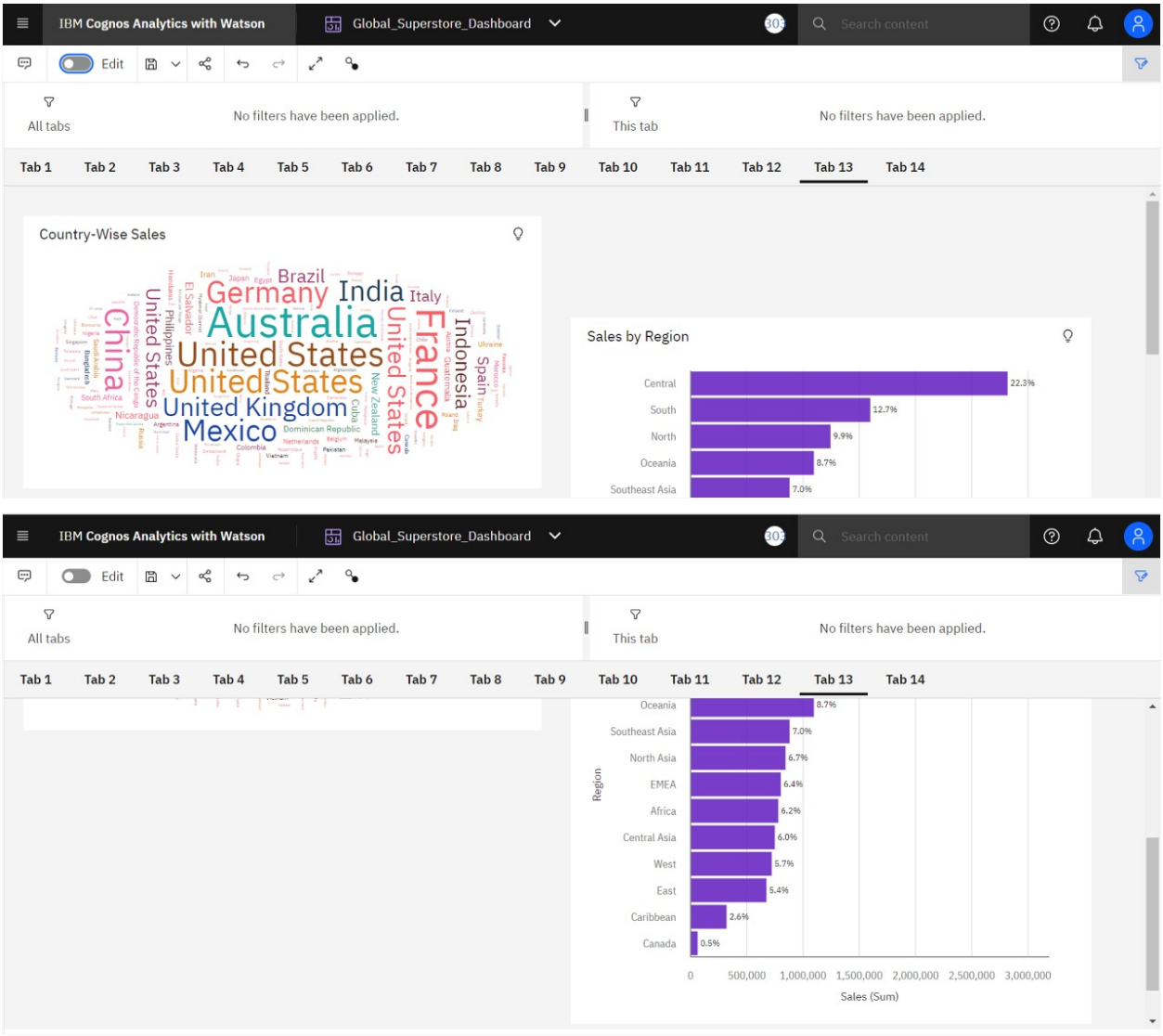
11. In the below Map Graph, we have taken Country as Regions,Profit as Regions heat and Sales as Size.



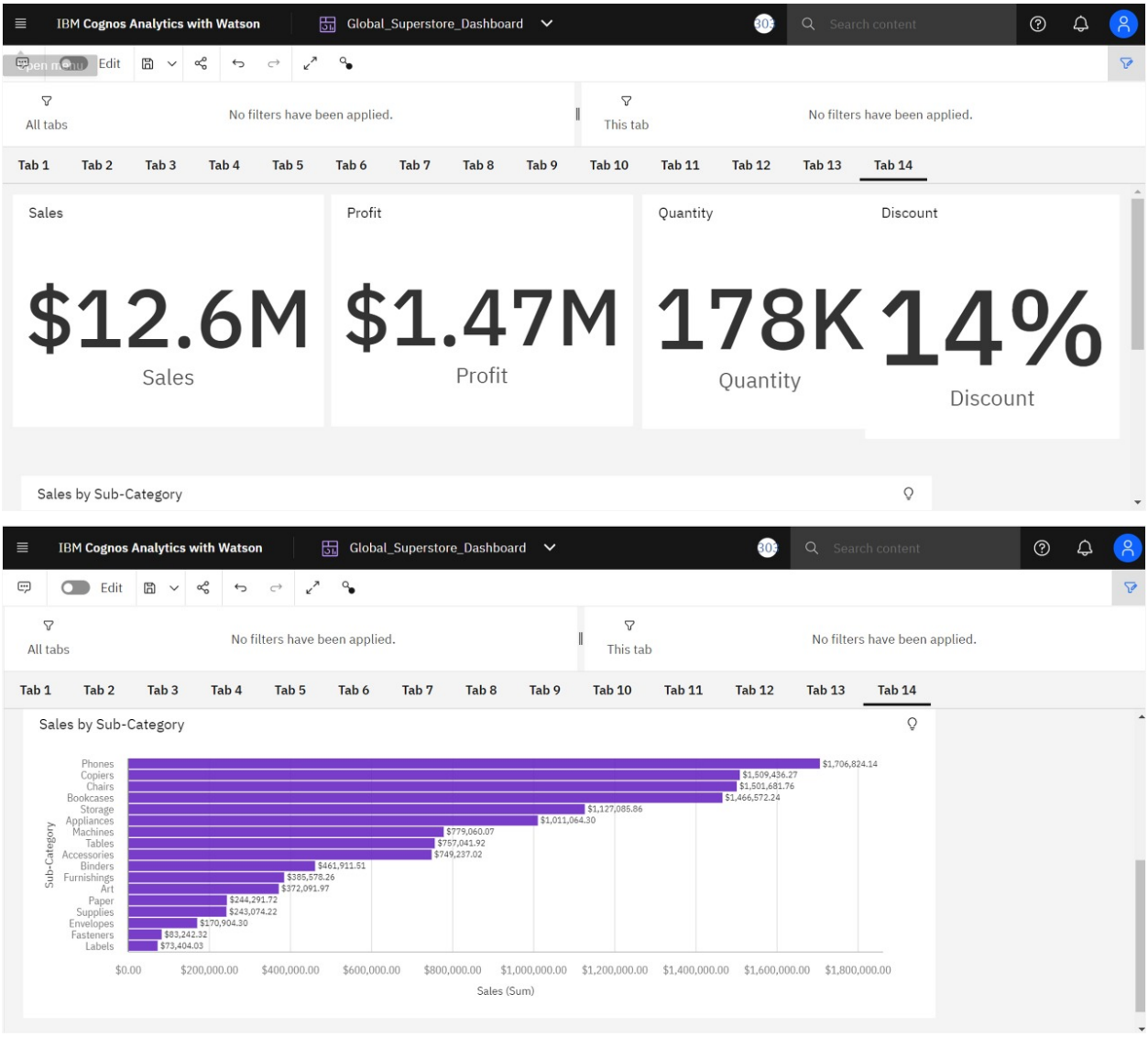
12. In the below Radar Graph, we have taken Region as x-axis, Sales as y-axis, Segment as Color, Category as Repeated Column.



13. In the below left Word Cloud for Country-Wise Sales, we have taken Country as Words, Sales as Size,Region as Color, In the below right Bar Graph we have taken Regions as Bars,Sales as Length.



14. In the below Image, Four Summary Graphs are given. The first Summary Graph is of Sales Value, the second is of Profit Value, the third is of Quantity Value and the fourth is of Discount Value.Below them is the Bar Graph given in which we have taken Sub-Category as Bars and Sales as Length.



ADVANTAGES AND DISADVANTAGES OF CREATING DASHBOARD

ADVANTAGES

- Enhanced Visibility: Dashboards provide greater visibility with information available whenever it is required to ensure businesses are better placed to respond to changing market conditions

    - Timesaving Efficiency: With dashboards, we are no longer wasting valuable time generating reports from multiple systems. Instead, data is drawn from a source and displayed as an easy to interpret visual overview
    - Better Forecasting: With greater insight into the data, future demand can be more accurately predicted using historic information. Businesses can be more effectively planned for demand fluctuations, setting measurable goals and deliverables for greater success
    - Better Decision Making: Whether you're providing reporting and analysis for the entire organisation or functional areas of the business, a dashboard allows companies to analyse key data quickly and meticulously. Visualised interactivity serves to deliver overwhelming amounts of data in a way that is easy to understand. With the ability to easily identify what the data really means; better decisions can be made relevant to the business.

DISADVANTAGES

- Flashy or cluttered design, with users attempting to incorporate too much information without understanding constraints or considering their specific

needs from the range of different measurables detailed data analysis provides.

· The technology used in the development of dashboards differs from other software solutions already employed in organisations and can be initially difficult to understand.

· The business has no predetermined rules and hierarchies for how dashboard metrics are used. This means each employee can use the metrics in different ways, resulting in a diverse set of data being reported.

APPLICATIONS

· If you manage complex campaigns, you usually end up having several analytics solutions for each platform and needing to consult them separately, which hinders the overall view. Instead, the dashboard displays data from different sources, like web analytics solutions, social media metrics. This way, makes it much easier to compare them and see how they develop.

· A good dashboard clearly shows you a number of key metrics so you don't need to be an analytics expert to understand them. If you want to look further into a particular data set, you always have the option of employing more specific tools.

· If you synchronize your dashboard automatically in the cloud, you can create different users so that your entire team can access the same information from anywhere. It's even possible to project the dashboard onto a

screen in your office so that the whole team can see what is going on in real time.

· Having a centralized dashboard will save you a lot of time. Instead of collecting data from different sources and making charts on your own, dashboards do all this work for you. You just need to invest some time at the beginning to set up the metrics and decide how to present them. From that point on, the reports are created automatically.

CONCLUSION

From this project, we have successfully:

- Created multiple analysis charts / graphs
- Used the analysed chart creation of dashboard
- Saved and visualised the final dashboard in the IBM Cognos Analytics

FUTURE SCOPE

Various other charts can be prepared like:

- Regarding Year_Order and Day_Order Columns.
- Regarding Market and Shipping Costs Columns.