

GLOBAL SALES DATA ANALYTICS

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A PROJECT REPORT
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It was a great learning experience. We would like to take this opportunity to express our gratitude.

DATE:

18/11/2022

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TITLE

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1 INTRODUCTION

1.1 Project 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, this project is done to try to understand a few things like, Customer Analysis and Product Analysis of this Global Super Store.

If you want to achieve your sales goals month after month, then guesswork and intuition aren't your best friends. You need to perform a strategic sales analysis and get cold, hard data.

1.2 Purpose

By the end of this Project, you will:

- Know fundamental concepts and can work on IBM Cognos Analytics.
- Gain a broad understanding of plotting different visualizations to provide a suitable solution.
- Able to create meaningful Visualizations and Dashboard(s).

Regular sales data analysis provides an understanding of the products that your customers are buying and helps you dissect why they are behaving in a certain way. You can also find patterns in your lead conversions and drop offs. All of these aspects enable you to optimize you.

2 LITERATURE SURVEY

EXISTING PROBLEM

Crafting a good sales pitch from sales data analysis can be difficult. Getting the right data, hitting the right client pain points, crystallizing why your services are better than the competitors, all takes hard work. Honing your sales pitch to an art takes time, and even with a perfect picture, new clients take time to acquire. One of the best ways we've found to build a good sales pitch is to use data you already have. In the digital world, there is no shortage of data, which translates into no shortage of potential competitive insights and advantages. With databases, data warehouses, corporate intranets, best practice sharing, web analytics, voice of the customer information, and QA or Six Sigma data, you are well-poised for discovering good information.

References

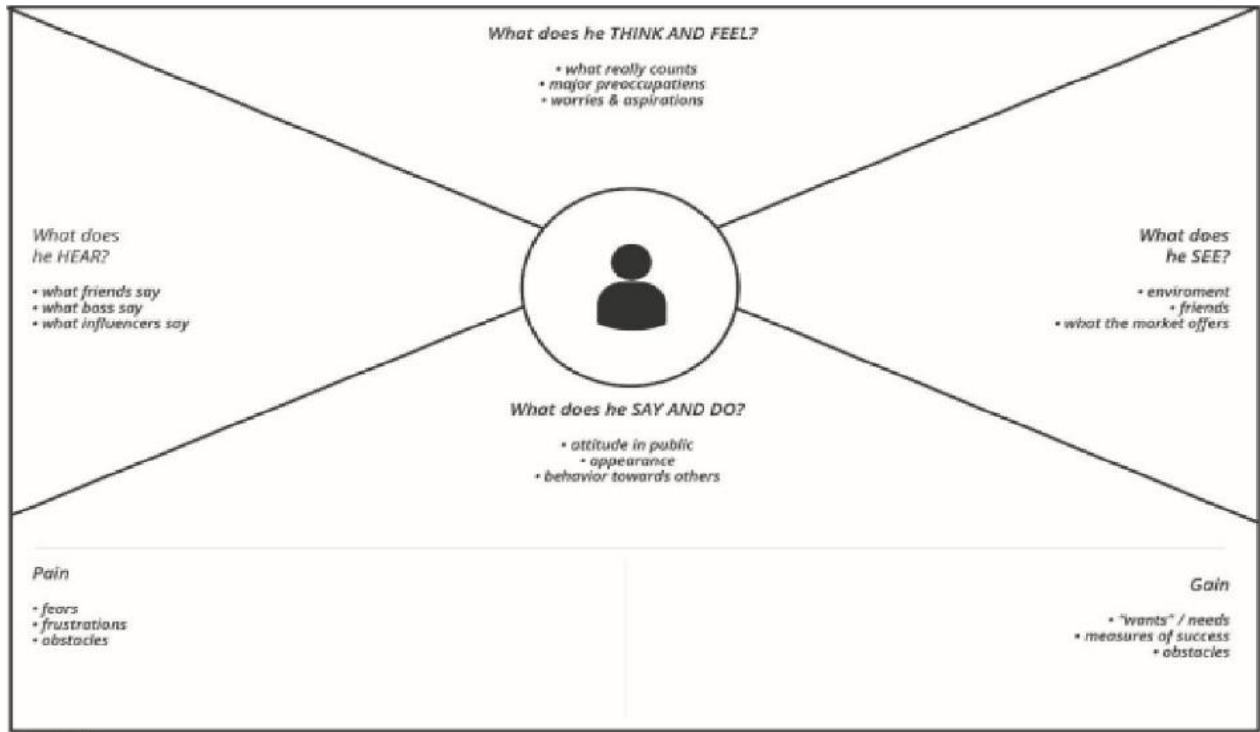
- 1.Data analysis and visualization of sales data 2016
- 2.Walmart's Sales Data Analysis - A Big Data Analytics Perspective - Dec2017
- 3.Research on Refined Sales Management, Data Analysis andForecasting under Big

Problem Definition Statement

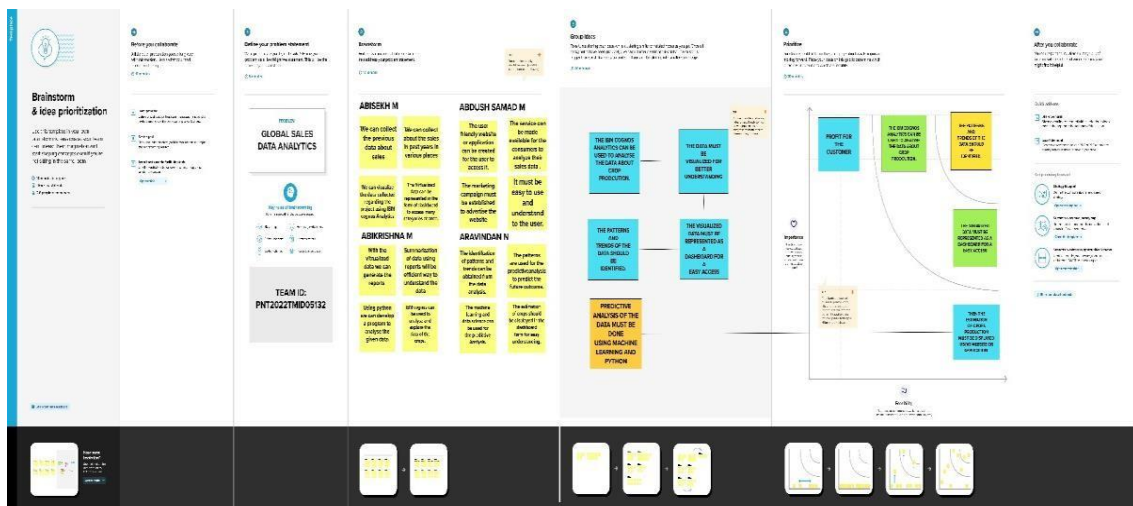
The overall purchase power of the consumer and also sales capacity of company. Unavailability of products equally between the consumers. There is no proper distribution of products among the customer The customers are not getting the products they prefer. By hearing out to the consumers and collecting their user preference data. Data analytics and data visualization is usedfor this.

3 IDEATION & PROPOSED SOLUTION

Empathy Map Canvas



Ideation & Brainstorming



Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The user needs a way to track and maintain overall sales data so that he can make more profit. The user needs a strategy to market the products so that it reaches all people through media. The user finds the key performance indicators so that he can boost the annual sales and reduces customer churn.
2.	Idea / Solution description	A good sales dashboard is the solution. We can monitor the sales by its geographic location and track order purchases. We can monitor the monthly sales and stocks retained on each product. Create and approve sales orders, track order purchases, improve sales tracking and optimization of goods delivery.
3.	Novelty / Uniqueness	Provides Real-Time Data, Can Help the Team Set Goals, Gives a Clear Overview of Sales Activity, Allows for the Identification sales of growth opportunities and Identifies opportunities for improvement.
4.	Social Impact / Customer Satisfaction	Ensures sustainability in global market. Creates meaningful change in business approach. Trying to attract customers of all range.
5.	Business Model (Revenue Model)	A Sales dashboard enables direct insight into your revenue driving force, allowing you to plan, implement and improve with data-based decisions.
6.	Scalability of the Solution	The great thing about Sales Analytics is that it gives you answers, and you need to ask the right questions. With accurate insight into current customers, a higher retention rate, as well as increasing revenue, can be achieved. Having real-time insight into increasing and decreasing customers will allow your Sales Team to focus on the right clients at the right time and efforts are driven towards suitable clients. A Sales Dashboard helps you visualize your Sales data, which is helpful for efficient decision-making and analysis performance.

Problem Solution fit

1. CUSTOMER SEGMENT(S)

A Business organization, online store or seller who would like to understand more about sales in global scale.

5. CUSTOMER CONSTRAINTS

Check input file structure before uploading a file.
Not enable of easy payment.

6. AVAILABLE SOLUTIONS

The competition perform analytics and display dashboard with dynamic insights.

End product provides facility to add manual or dynamic to the dashboard

2. JOBS-TO-BE-DONE / PROBLEMS

Determination input file structure

What analysis to perform to be useful?

4. PROBLEM ROOT CAUSE

Unpredictable sales

Market down

Big amount of data

3. BACKGROUND

Collecting sales data

Utilize the data in efficient way.

1. HOOKS

Have you ever felt that you are unaware of how your business is performing?

4. EMOTIONS: BEFORE / AFTER
Before: Misunderstanding, unpredictable, decision fatigue.
After: clear mind, better understanding

10. YOUR SOLUTION

Easy payments
Responsive design
Creating an interactive dashboard.
User specified design.

8. CHANNELS OF BEHAVIOUR

Using third party software or services with automation insights and subscriptions based services to analyse data.

Offline software to analyse complex data in un-intuitive way.

4 REQUIREMENT ANALYSIS

Functional requirement

Following are the functional requirements of the proposed solution

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Collects Data	Providing CSV file Authentic Datasets
FR-4	Cleans the given Data	Prepares data for EDA purpose
FR-5	Visualisation of Data	Identifying trends in given data Accurate visualisation of provided numbers
FR-6	Create Dashboard	Analysation of the dataset's Key performance indicator
FR-7	Reporting	The reporting function helps users have complete control over their business. The real-time reporting collects current information and displays the data on an intuitive user interface.

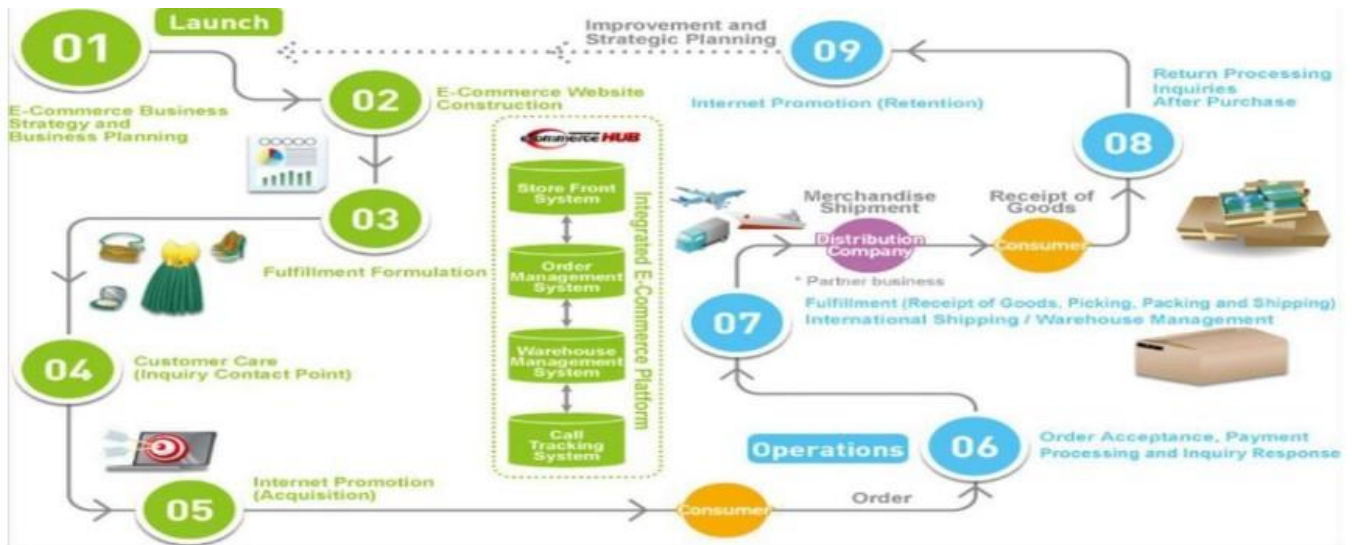
Non-Functional requirements

Following are the Non functional requirements of the proposed solution

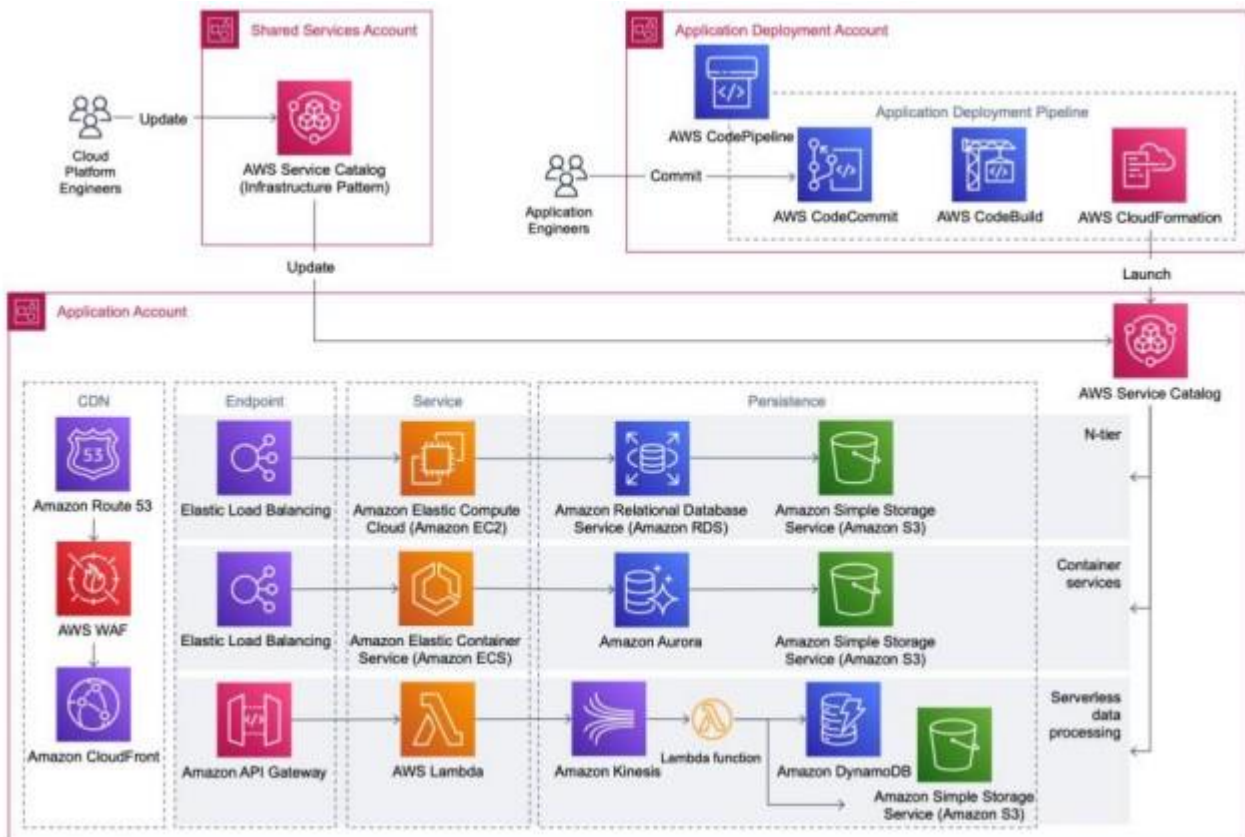
NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	It should be easier to understand the insights for the customers.
NFR-2	Security	The data is protected from unauthorized access.
NFR-3	Reliability	App could be run offline while server maintenance takes place. Server traffic would not be an issue.
NFR-4	Performance	Requires minimum system requirements, hence could be accessible in many devices with faster loading time.
NFR-5	Availability	Server is online 24/7 hence users could use the app at any time. App will work offline as well/
NFR-6	Scalability	Dashboards/Templates are very much Scalable, the user can modify the metrics whenever they want.

5 PROJECT DESIGN

Data Flow Diagrams



Solution & Technical Architecture



User Stories

Customer (Web user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
	Login	USN-3	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN-4	As a user, I can enter data to conduct business analysis to make business decisions		High	Sprint-1
Customer Care Executive			As a Customer Care Executive, I can answer users' queries		High	Sprint-1
Administrator			As admin, can make changes to the interface according to the needs		High	Sprint-1

6 Project Planning & Scheduling

Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Abikrishna M, Abhishek M
Sprint-2	Dashboard	USN-2	As a user, I can enter my sales information to clean it up and get it ready for analysis, and I can also locate my information to perform a business analysis.	3	High	Aravindan N, Abdush Samad M
Sprint-3	Customer Care	USN-3	As a user, I can enter my sales information to clean it up and get it ready for analysis, and I can also locate my information to perform a business analysis.	2	Low	Aravindan N, Abikrishna M, Abdush Samad M
Sprint-4	Administrator	USN-4	As an admin, I can modify the user interface to meet the needs of the users.	3	High	Aravindan N, Abdush Samad M, Abikrishna M, Abhishek M

Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	7	6	24 Oct 2022	14 Oct 2022	7	29 Oct 2022
Sprint-2	5	6	31 Oct 2022	15 Nov 2022	5	05 Nov 2022
Sprint-3	3	6	07 Nov 2022	18 Nov 2022	3	12 Nov 2022
Sprint-4	5	6	4 Nov 2022	19 Nov 2022	5	19 Nov 2022

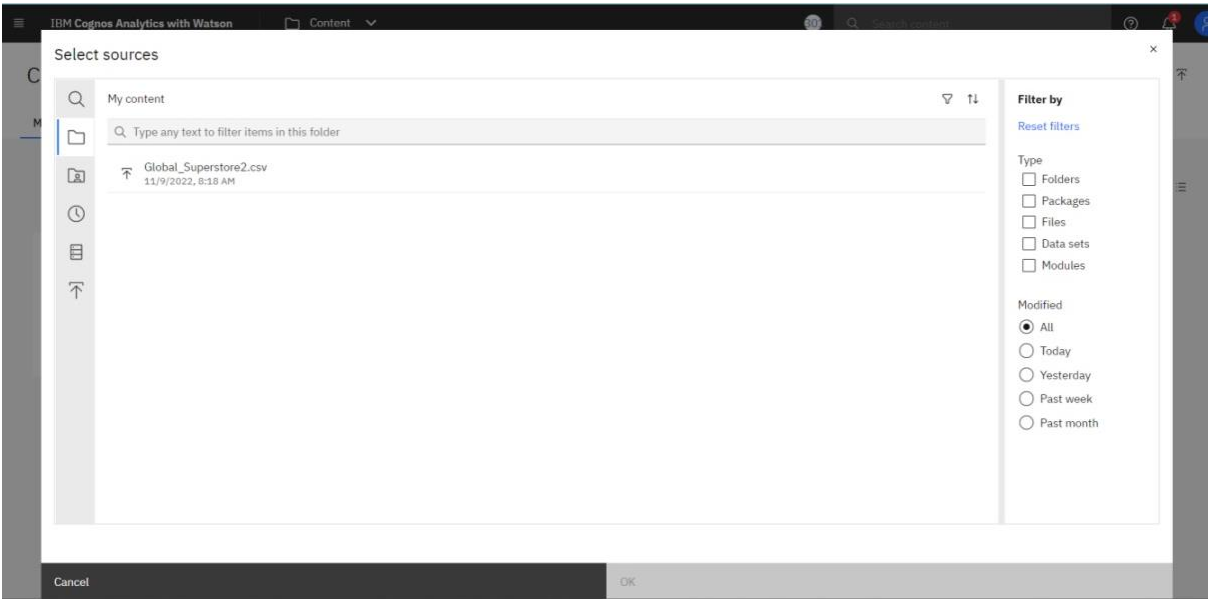
7 CODING & SOLUTION

Database Schema

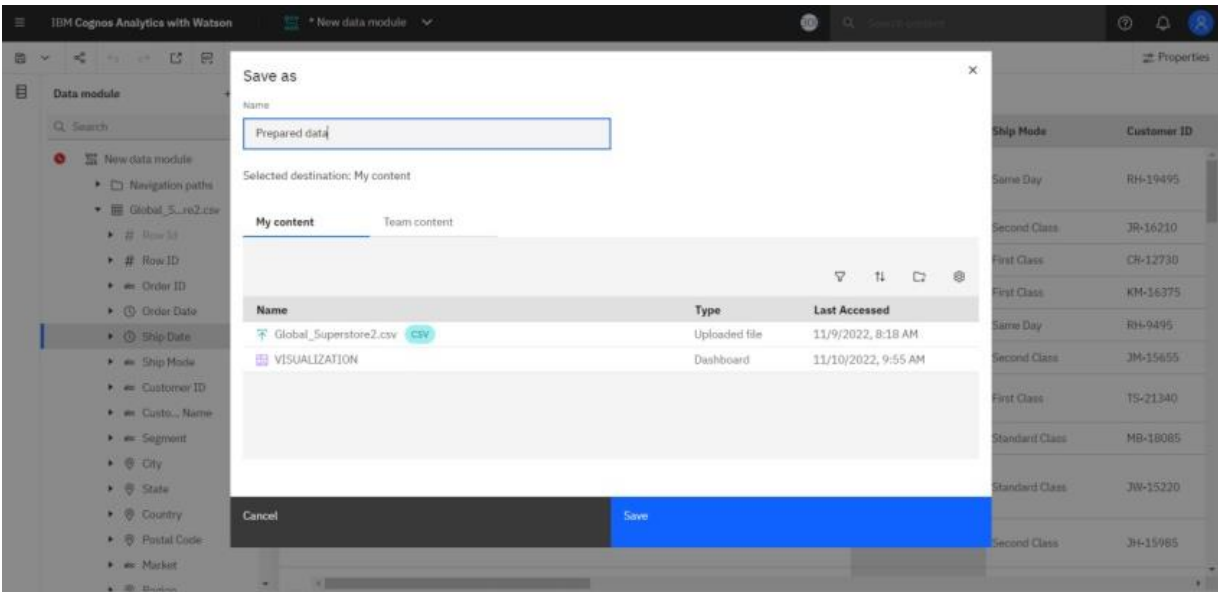
Build the following visualizations

1. Global Superstore Data Upload.
2. Global Superstore Data Prep.
3. Date Calculations and Navigation path.
4. Segment wise Sales, Profit and Qty.
5. Use Pie to showcase Sales by Order Priority and Sales by Market.
6. Use a Tree Map to present Sales by Sub-Category
7. Using a Bar chart present Sales by Region by the Sales Order.
8. Present Regional Sales using Map Country points -- Showcase Top 10 countries.
9. Present Sales (Bar), Profit (line) by Sub-Category using Line and Column Chart.
10. Sales vs Profit Scatter Plot with Sub-Category points and Region in Colour.
11. Sales and Profit Forecast by Month Country as Region and Region as Filter.
12. Sales vs Profit forecast by Month by Order Priority.
13. Show the Min, Max, and Avg Sales by Sub-Category using the Box plot.
14. By setting a 10% extra Target for Sales Present Segment-wise Sales use Bullet Chart.
15. Present Sales using Hierarchy Bubbles by Market / Region.
16. Using a Legacy Map Present Sales vs Profit by Country / Region.
17. Showcase Quantity Sold by Radar Chart across various Regions.
18. Present Monthly Sales by Sub-Category using Waterfall chart.
19. Present Sales Vs. Profit of Countries by Word Cloud.
20. Sales dashboard with Summary Cards.

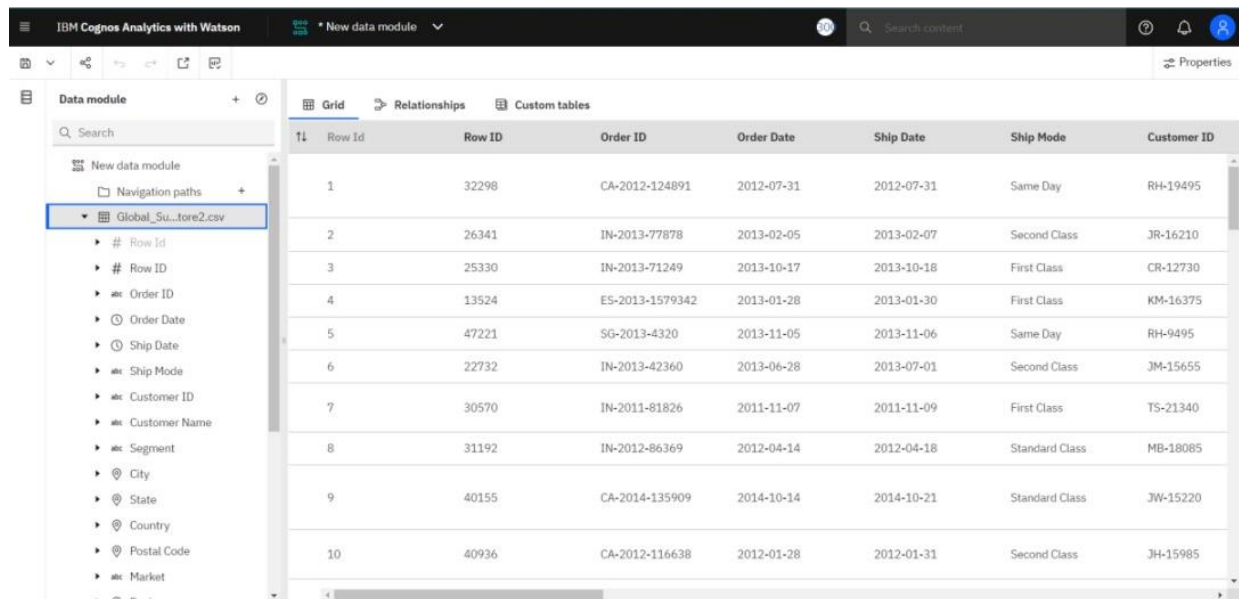
Global Superstore Data Upload



Global Superstore Data Prep



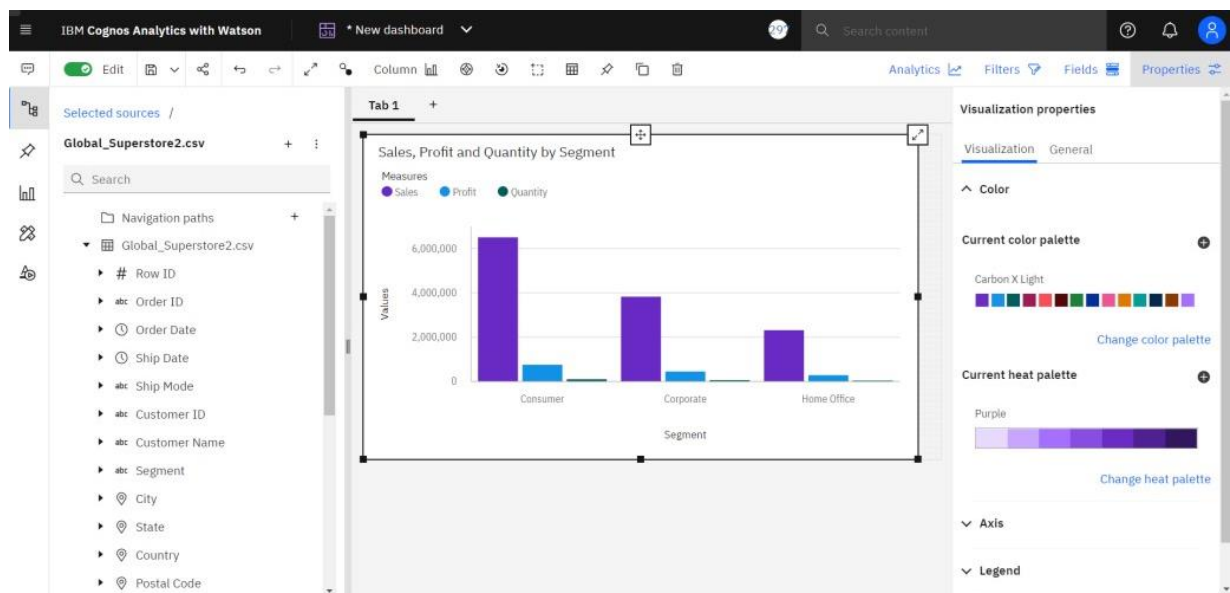
Date Calculations and Navigation path



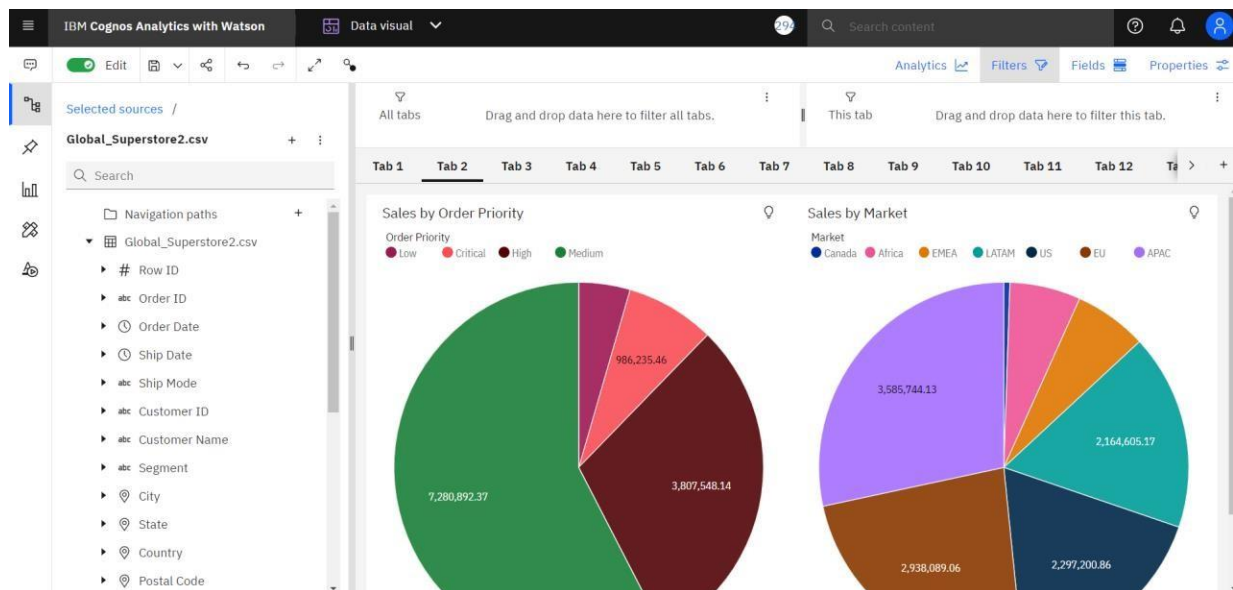
The screenshot displays the IBM Cognos Analytics with Watson interface. The left sidebar shows the 'Data module' with a search bar and a list of fields from the 'Global_Superstore2.csv' dataset. The main area shows a table with columns: Row Id, Order ID, Order Date, Ship Date, Ship Mode, and Customer ID. The table contains 10 rows of data.

Row Id	Order ID	Order Date	Ship Date	Ship Mode	Customer ID
1	CA-2012-124891	2012-07-31	2012-07-31	Same Day	RH-19495
2	IN-2013-77878	2013-02-05	2013-02-07	Second Class	JR-16210
3	IN-2013-71249	2013-10-17	2013-10-18	First Class	CR-12730
4	ES-2013-1579342	2013-01-28	2013-01-30	First Class	KM-16375
5	SG-2013-4320	2013-11-05	2013-11-06	Same Day	RH-9495
6	IN-2013-42360	2013-06-28	2013-07-01	Second Class	JM-15655
7	IN-2011-81826	2011-11-07	2011-11-09	First Class	TS-21340
8	IN-2012-86369	2012-04-14	2012-04-18	Standard Class	MB-18085
9	CA-2014-135909	2014-10-14	2014-10-21	Standard Class	JW-15220
10	CA-2012-116638	2012-01-28	2012-01-31	Second Class	JH-15985

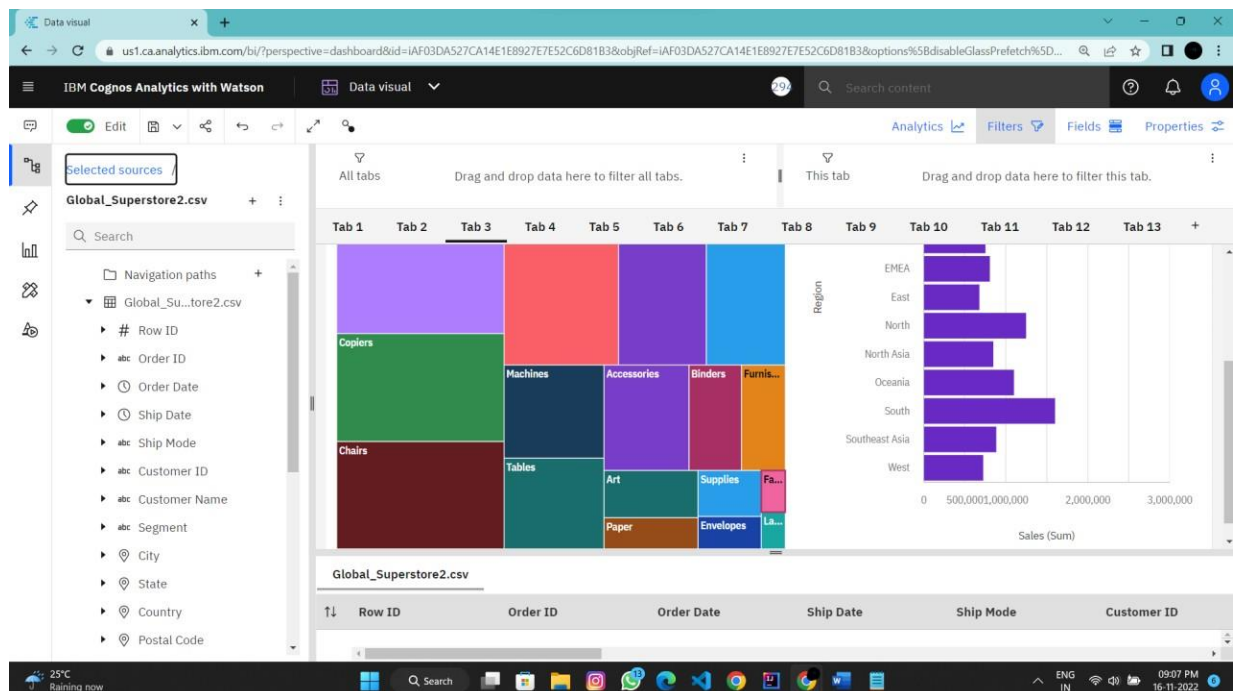
Segment wise Sales, Profit and Qty



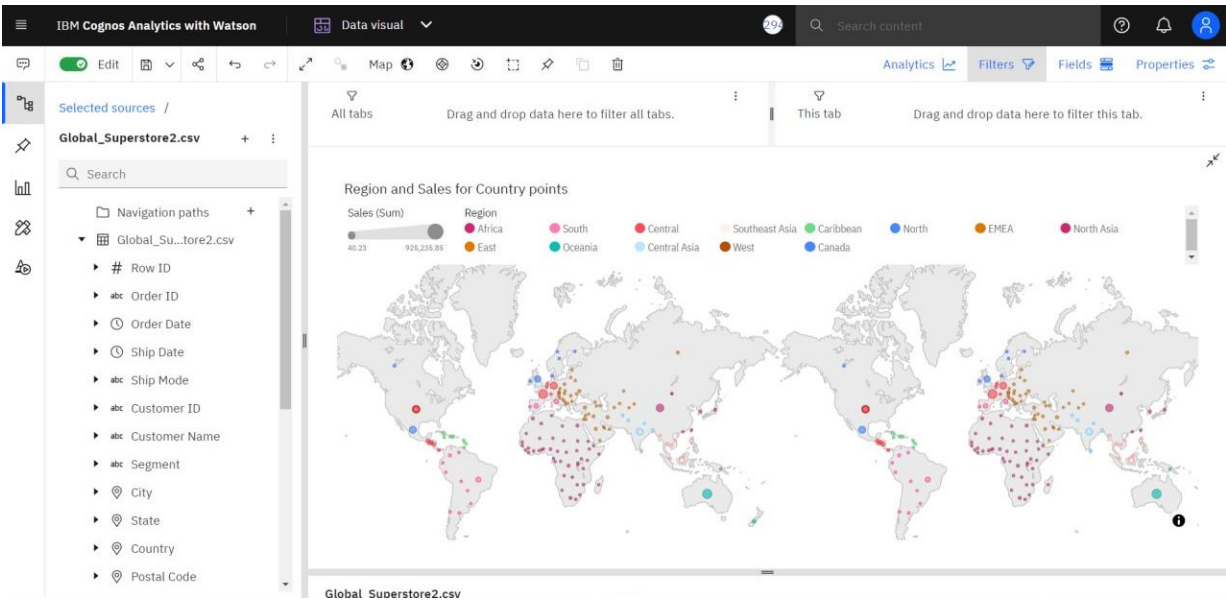
Use Pie to showcase Sales by Order Priority and Sales by Market



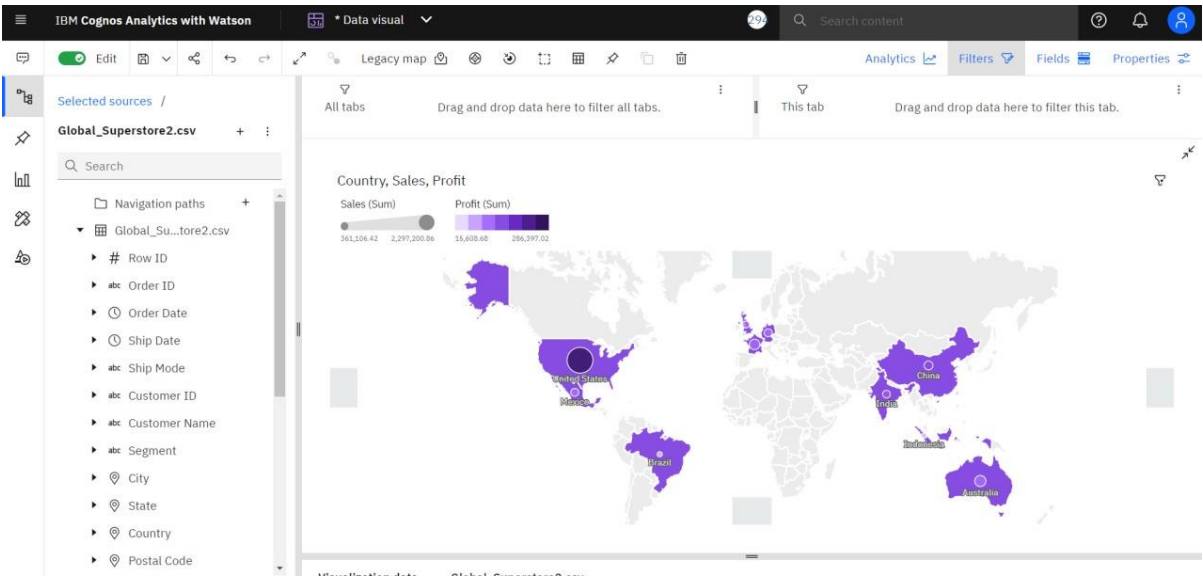
Use a Tree Map to present Sales by Sub-Category



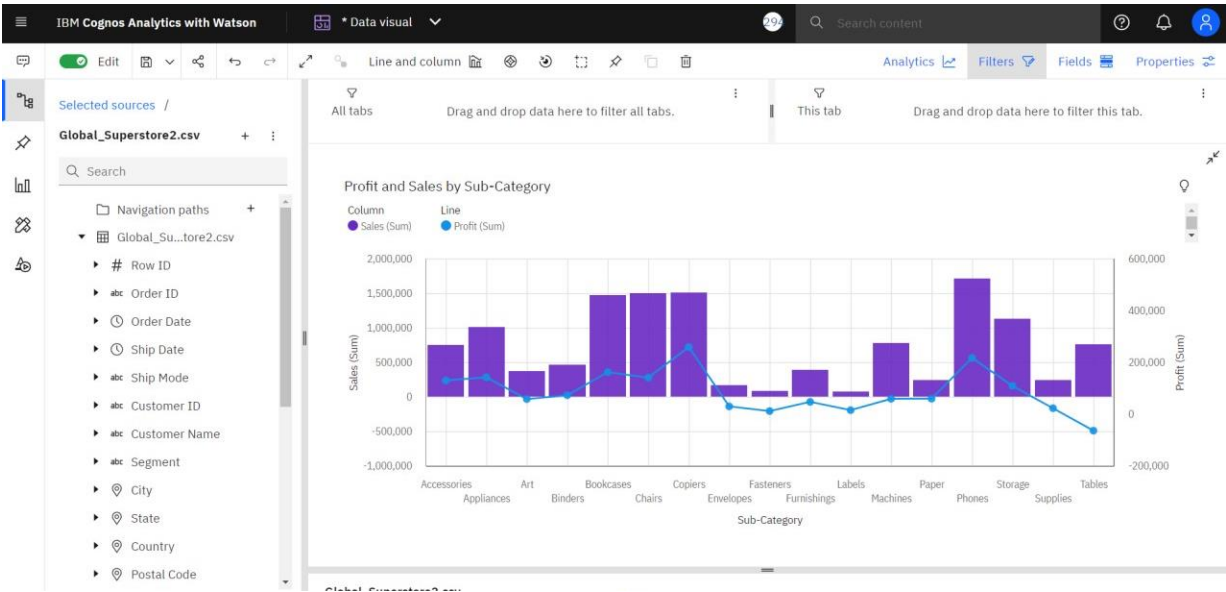
Using a Bar chart present Sales by Region by the Sales Order



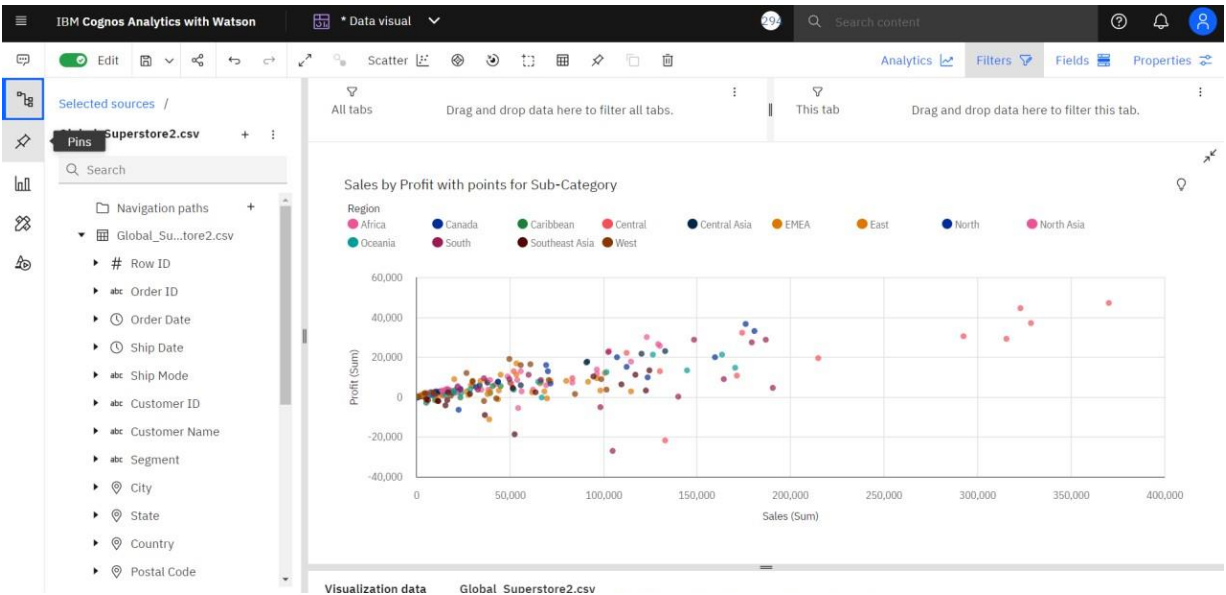
Regional Sales using Map Country points



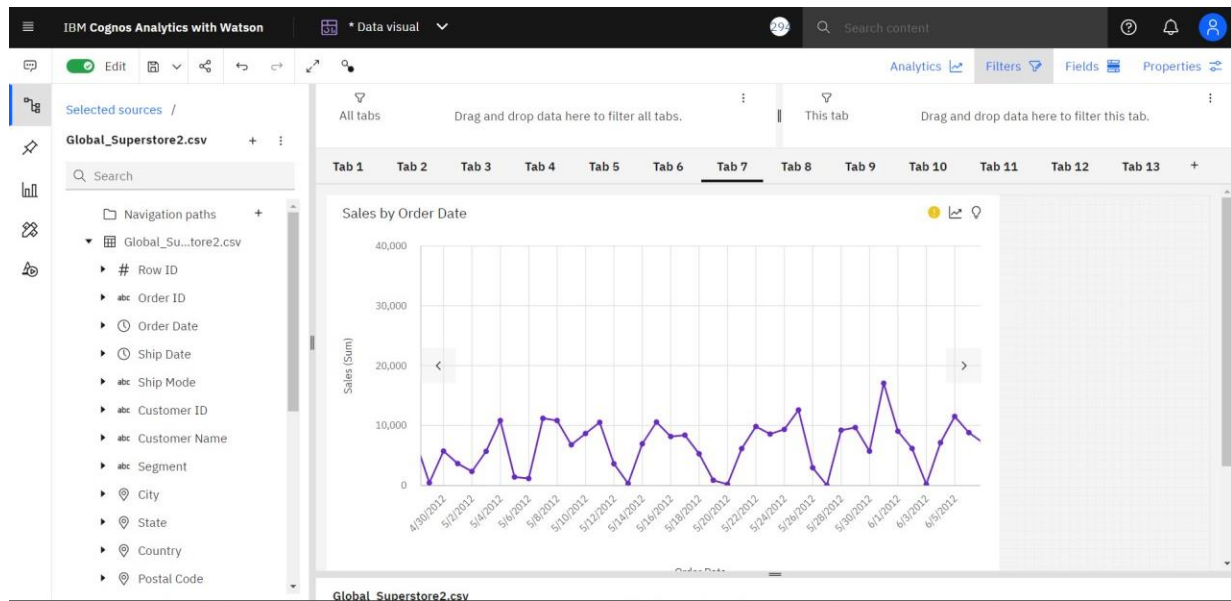
Sales (Bar), Profit (line) by Sub-Category



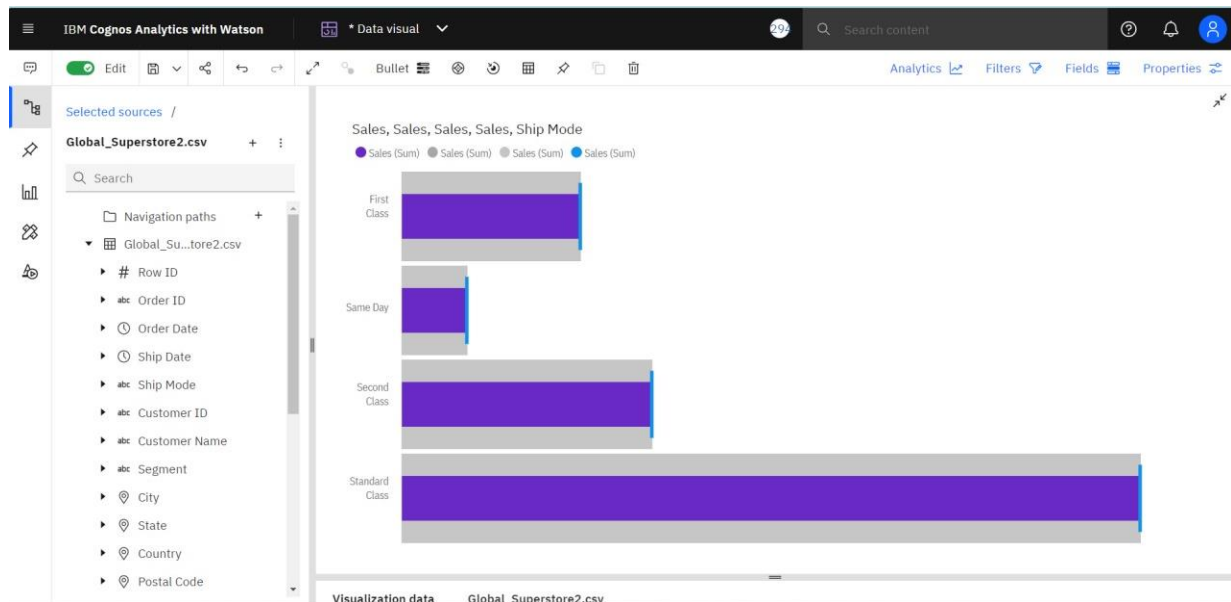
Sales vs Profit Scatter Plot with Sub-Category points



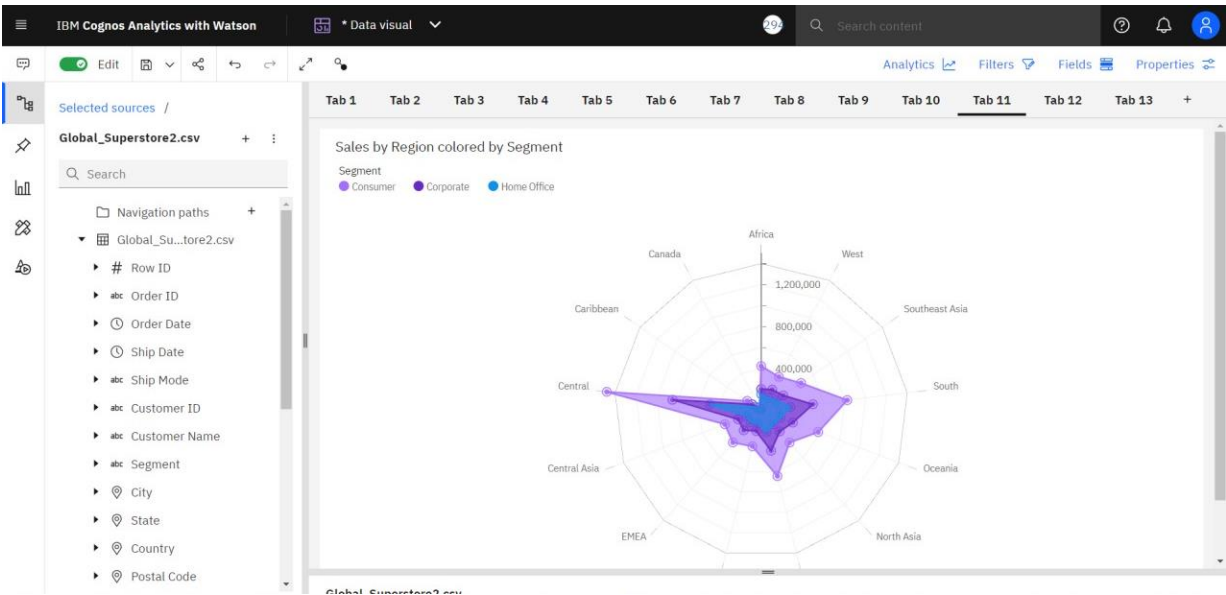
Sales vs Profit forecast by Month by Order Date



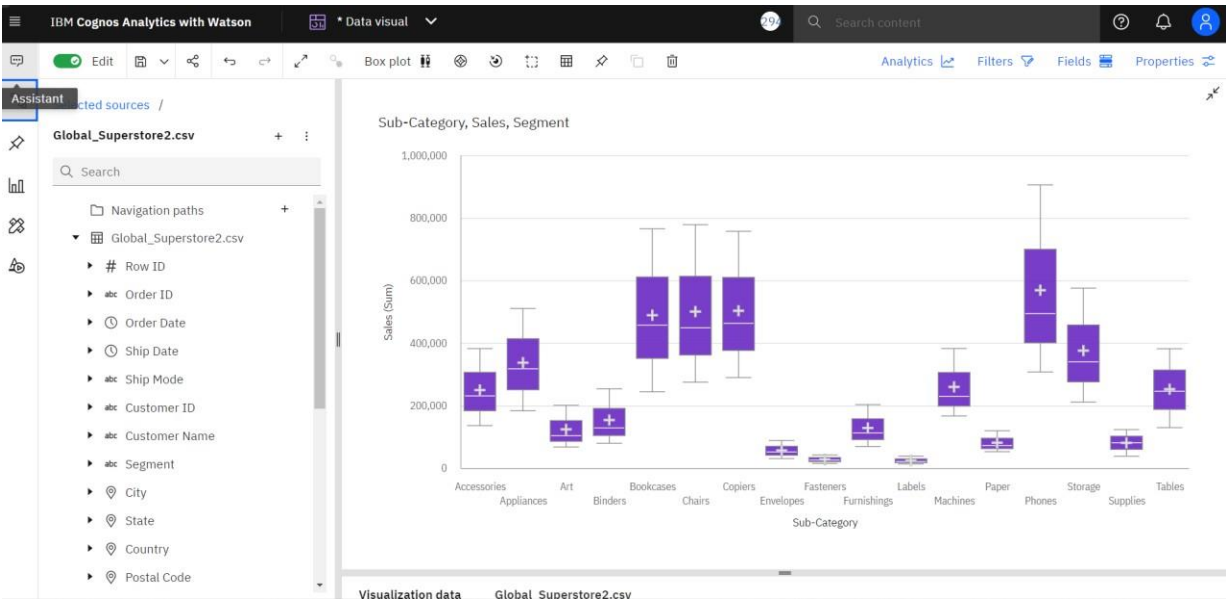
Target For Sales Present Segment Wise Sales Using Bullet Chart



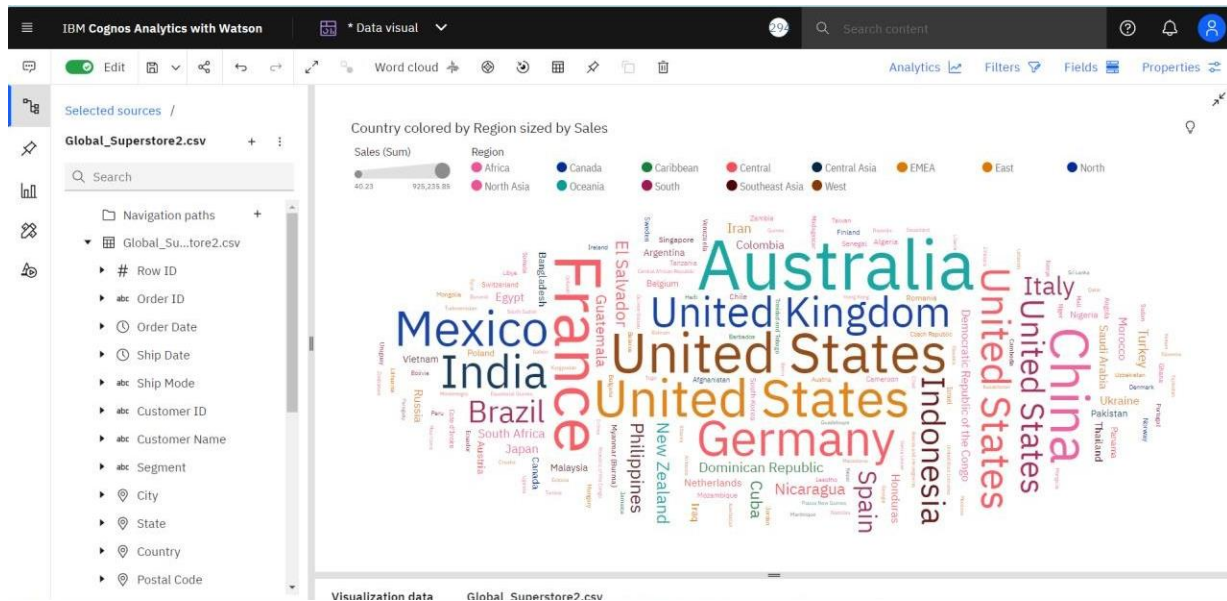
Radar Chart across various Regions.



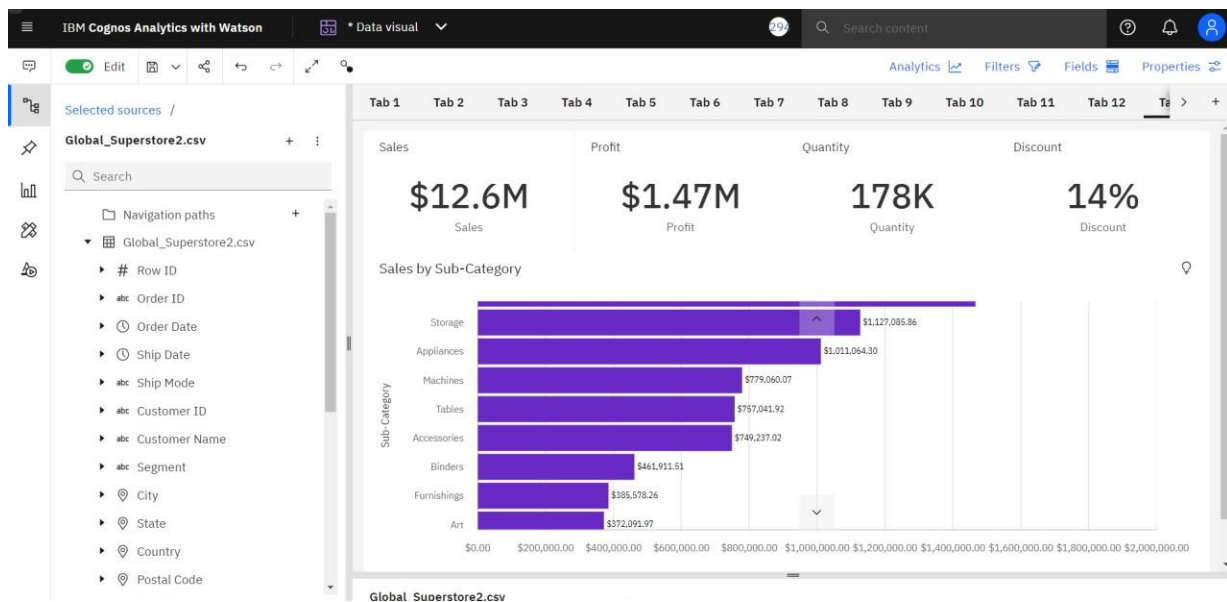
Show the Min, Max, and Avg Sales by Sub-Category using the Box plot



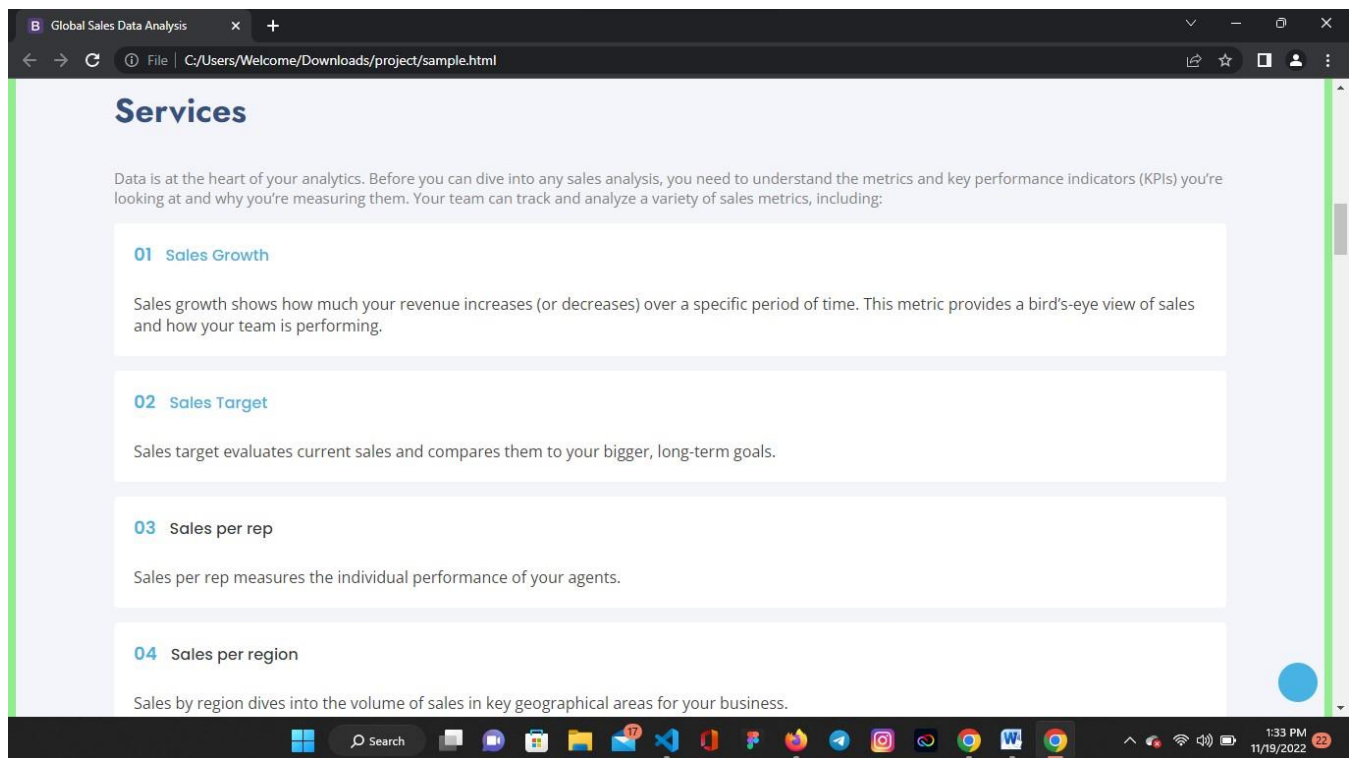
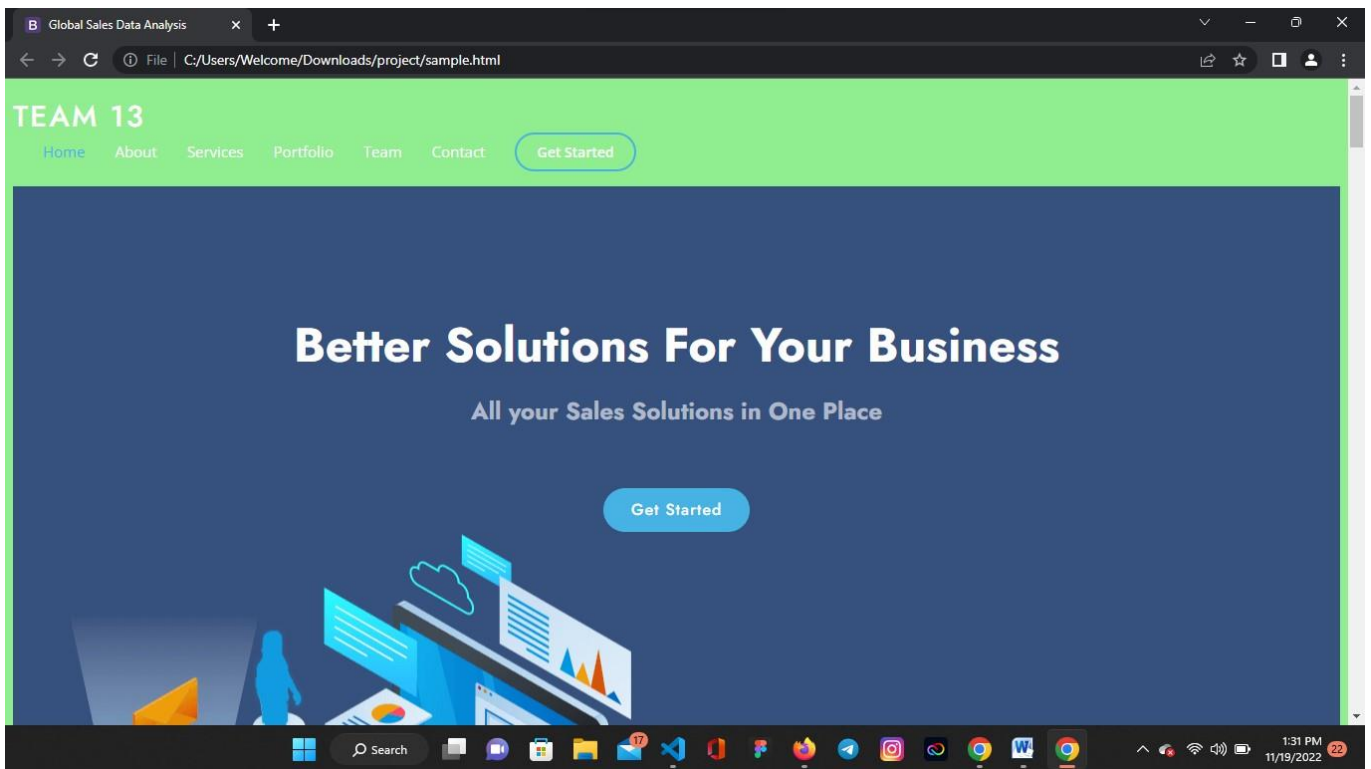
Country Colored by Region sized by Sales

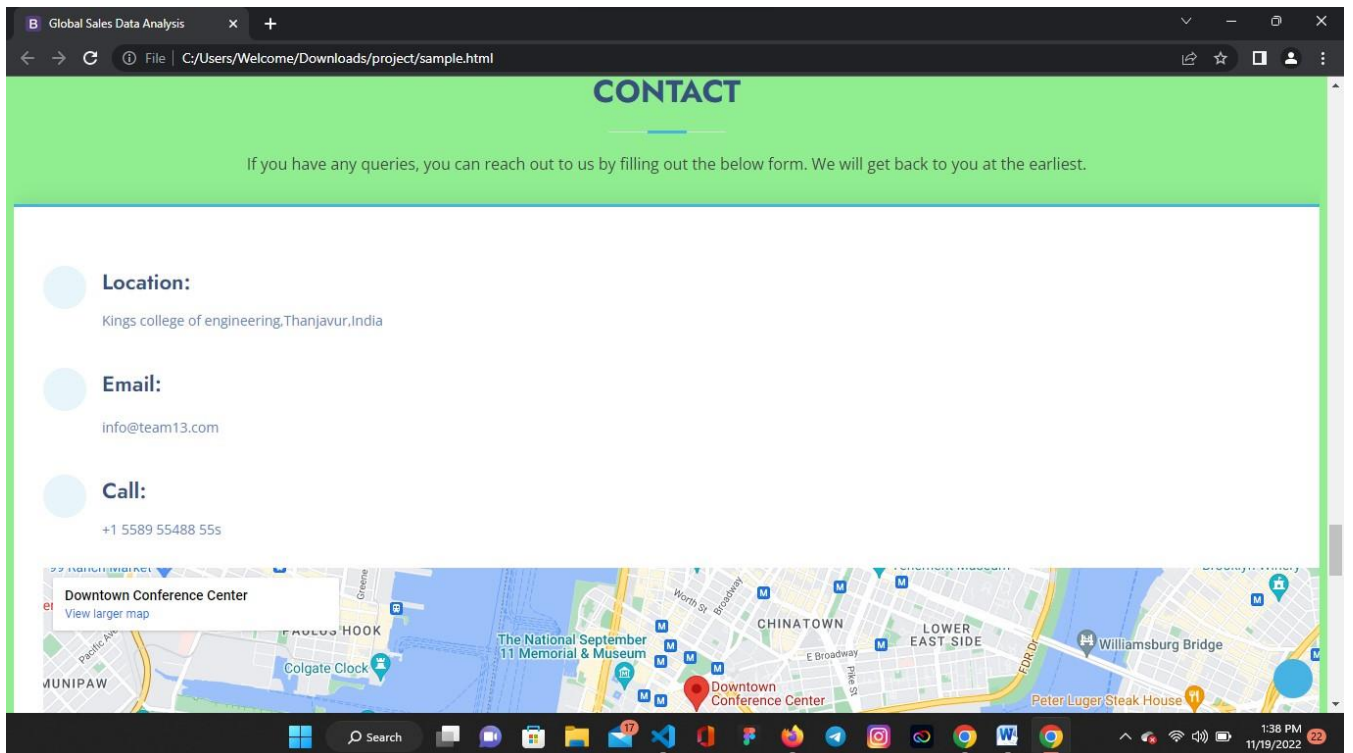
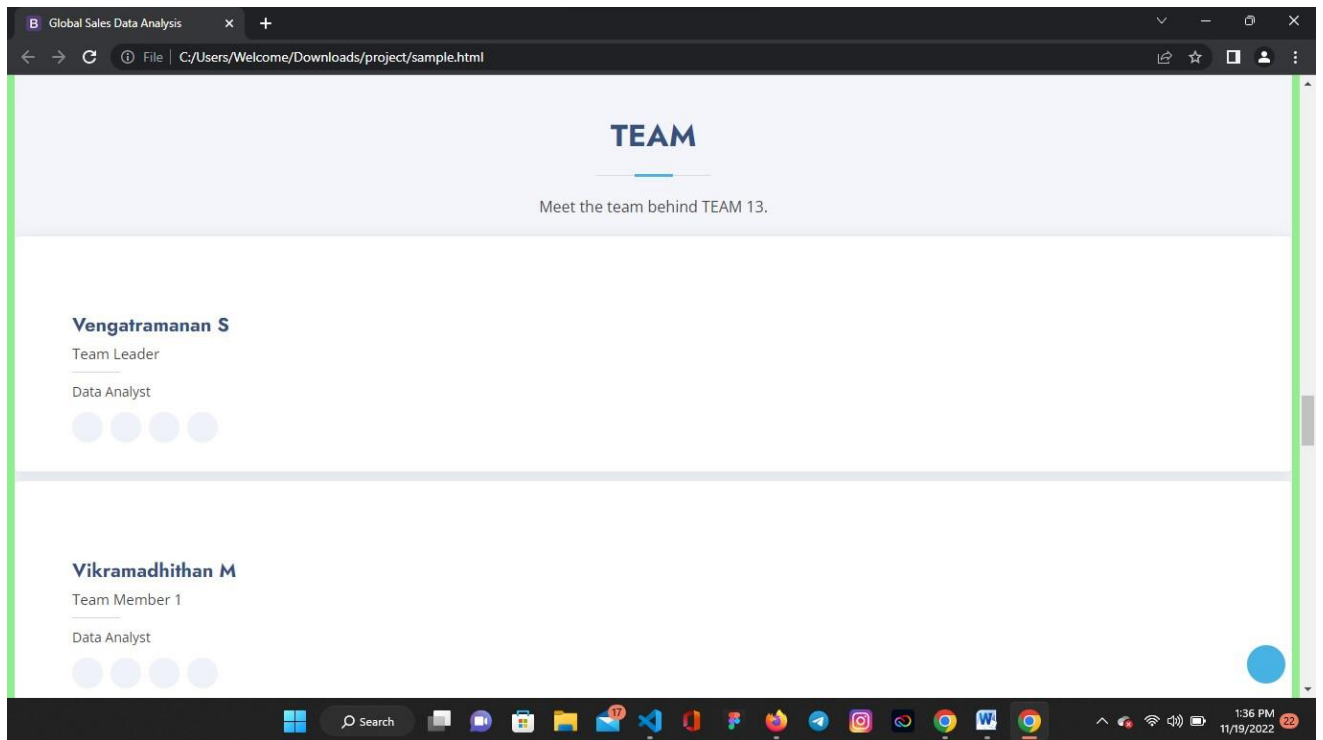


Sales by Sub-Category



Web Page





8 RESULT

Performance Metrics

This dashboard is created to understand a few things like, Customer Analysis and Product Analysis of the Global Super Store. This can be achieved by hearing out to the consumers and collecting their user preference data So that purchasing power will increase and beneficiary for both retailers and consumers.

9 ADVANTAGES & DISADVANTAGES

ADVANTAGES

- purchasing power will increase and beneficiary for both retailers and consumers.
- IBM Cognos analytics helps in building the dashboard and creating the exploration.

DISADVANTAGES

- A little bit confusing to choose the type of exploration

10 FUTURE SCOPE

Sales analytics refers to the use of technology to collect and use sales data to derive actionable insights. It is used to identify, optimize, and forecast sales. It uses different metrics and KPIs to plan an efficient sales model that generates higher revenue for the business

This dashboard is a responsive dashboard, so as we update the csv file uploaded in the IBM Cognos dashboard updates automatically so that this dashboard can be utilized infuture also.

This dashboard is also having forecast exploration which enables to predict future sale

11 CONCLUSION

By implementing this analytics solution, the company brought their competitive and sales data reporting in-house, cut costs and increased the accuracy of their reporting and analysis. As the company moves forward with this new solution, their sales reporting costs will most likely be reduced by 50 to 70%. They are now able to analyze raw data themselves, respond more quickly to changes in market trends and perform root cause analysis to determine those shifts in the market. By securing quicker access to their data with the new solution, the company was also able to reduce the risk associated with delayed responses to changes in their markets.

With the new solution, the company can now process sales reports faster than the outsourced solution, reducing turnaround time between 50% to 60%. The reporting needs of the company have been streamlined, consolidating over 10 reports into the centralized dashboard solution. The company's competitive analysis group is also able to more quickly respond to internal data requests given they have the ability to pull the information themselves. With this quicker response, the company is better able to react to changes in the market and predict opportunities for its sales force. The business also experienced an increase in the overall understanding of their sales data throughout the organization. The company now has great flexibility in the presentation of their sales and competitive data, while also being able to integrate sales data with other key data points for the organization.

References

1. Data analysis and visualization of sales data 2016
2. Walmart's Sales Data Analysis - A Big Data Analytics Perspective - Dec2017
3. Research on Refined Sales Management, Data Analysis and Forecasting under Big