PROJECT REPORT

TEAM ID	**PNT2022TMID09634**
PROJECT NAME	**GLOBAL SALES DATA ANALYTICS**
TEAM MEMBERS	**KOMALA P-(310619205049)** **ASHWIN S-(310619205014)** **GOKULAKRISHNAN R-(310619205031)** **HARISH KUMAR Y-(310619205035)**

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.

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).

2. LITERATURE SURVEY

2.1 Existing problem

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.

2.2 References

1.Data analysis and visualization of sales data - Mar-2016

Authors: Kiran Singh,Rakhi Wajgi

2.Walmart's Sales Data Analysis - A Big Data Analytics Perspective - Dec2017

Authors: Manpreet singh, Bhawick Ghutla, Reuben lilo Jnr, Aesaan F S Mohammed

3.Research on Refined Sales Management, Data Analysis and Forecasting under Big Data - Oct-2020

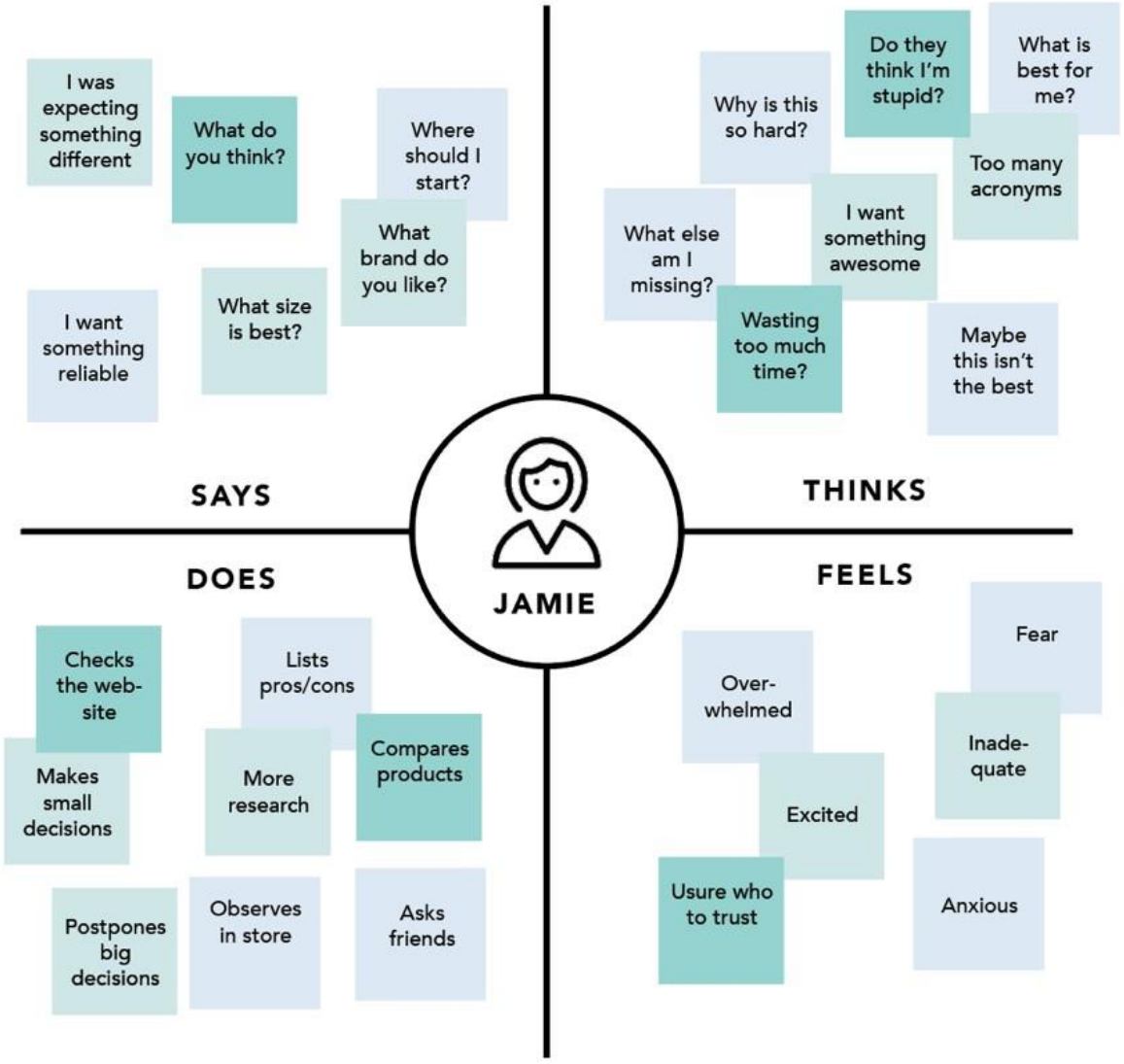
Author: Wenhui Shan

2.3 Problem Statement Definition

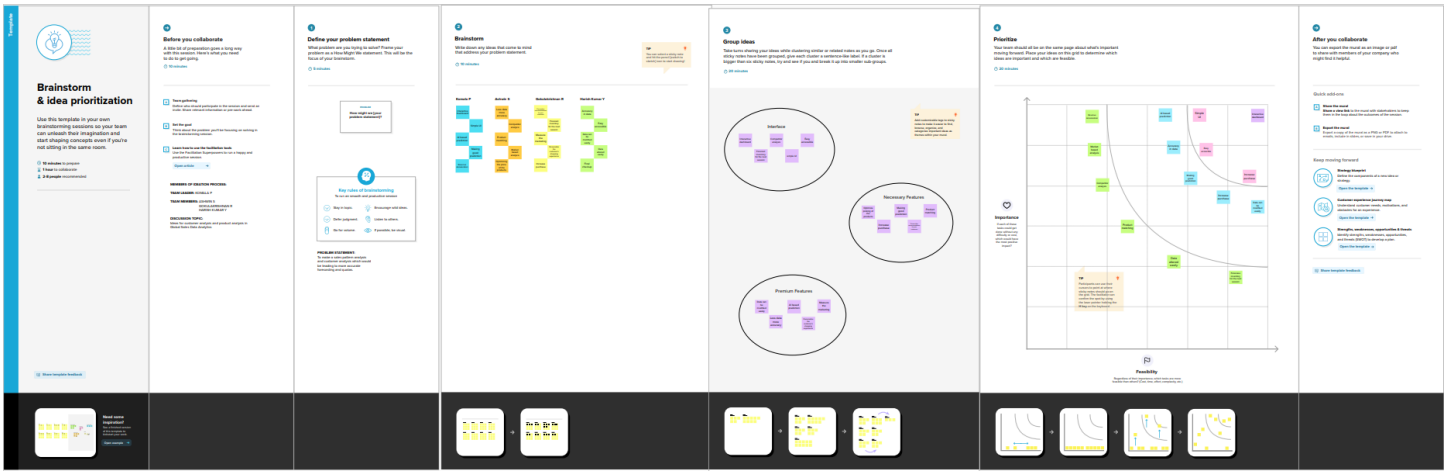
The overall purchase power of the consumer and also sales capacity of company. Unavailability of products equally between the consumers. There is no proper distribution of products among the customer The customers are not getting the products they prefer. By hearing out to the consumers and collecting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

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map



3.2 Ideation & Brainstorming



3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	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.
2.	Idea / Solution description	Analyse sales by demographic Analysis of customers Ex: city, age, gender. The goal of this process is to give more information about our data so that the marketing team prepares to intensify the efficiency based on the data.
3.	Novelty / Uniqueness	• Improve Value Propositions and Price Points • Narrow and Refine Product Offerings • Accurate Sales Forecasting
4.	Social Impact / Customer Satisfaction	By analysing the maximum products sales, we can keep in stock in the markets so that the people will not get affected in buying the needed products.
5.	Business Model (Revenue Model)	By analysing the sales data, the company starts generating the specific products more. By this, the company profit margin of these products gets more.
6.	Scalability of the Solution	Analysing the data continuously to improve the efficiency of the products.

3.4 Problem Solution fit

1.CUSTOMER SEGMENT

People and corporations who are interested in knowing the details and a complete global sales analysis of a product and related products for effective customer making organizations which wants to know their products sales details.

6.CUSTOMER LIMITATIONS

Lack of understanding over the business and the customer engagement over it

5.AVAILABLE SOLUTIONS

Sales metrics, revenues, gross number of sales. Simply measuring revenue or the gross number of sales isn't enough. The right metrics will depend on your company, but are valuable to learn more about your company, customers, and sales process.

2.PROBLEMS/PAINS

Sales Analysis provides insights into the past, present, and future performance of a business and can be used to help you forecast trends, identify opportunities for growth, and develop a strategic action plan for your company.

9.PROBLEM ROOT/CAUSE

Being lethargic that the business is doing fine, absence of customer involvement monitoring, presence and progress of competitors in global market.

7.BEHAVIOUR

Actions against losing customers, changes in budget, advertising and collaborations for betterment.

3.TRIGGERS TO ACT

Better performance of their business competitors, fall down of their performance.

4.EMOTIONS

Satisfaction and may lead to new achievement and betterment of self and business growth.

10.YOUR SOLUTION

- Creating an interactive dashboard.
- Providing specific details about sales
- Responsive design for every screen size
- Manual insight for each interaction.
- One time payment

8.CHANNEL OF BEHAVIOUR

8.1 ONLINE

Using third party services with automated insights and subscription based service to analyse data.

8.2 OFFLINE

Using office software to analyse complex data in un-intuitive way.

4. REQUIREMENT ANALYSIS

4.1 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.

4.2

4.3

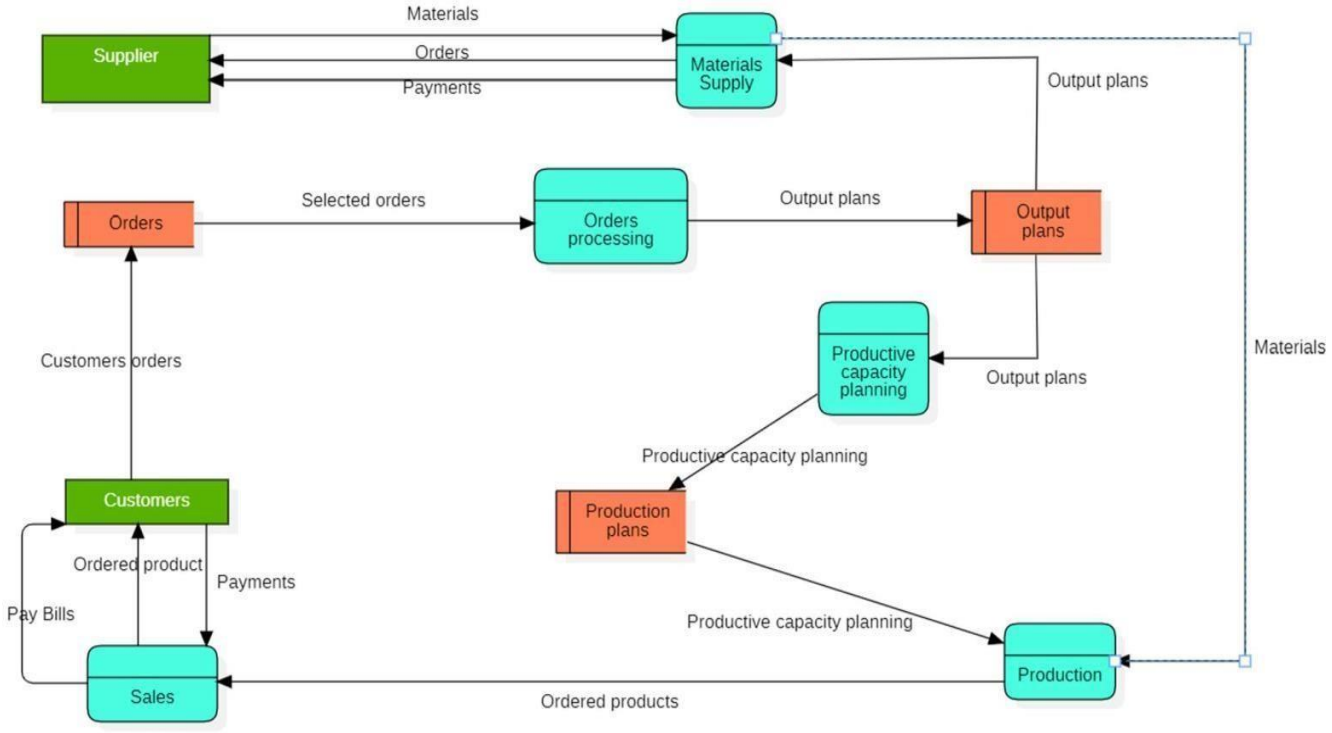
4.2 Non-Functional requirements

Following are the non-functional requirements of the proposed solution.

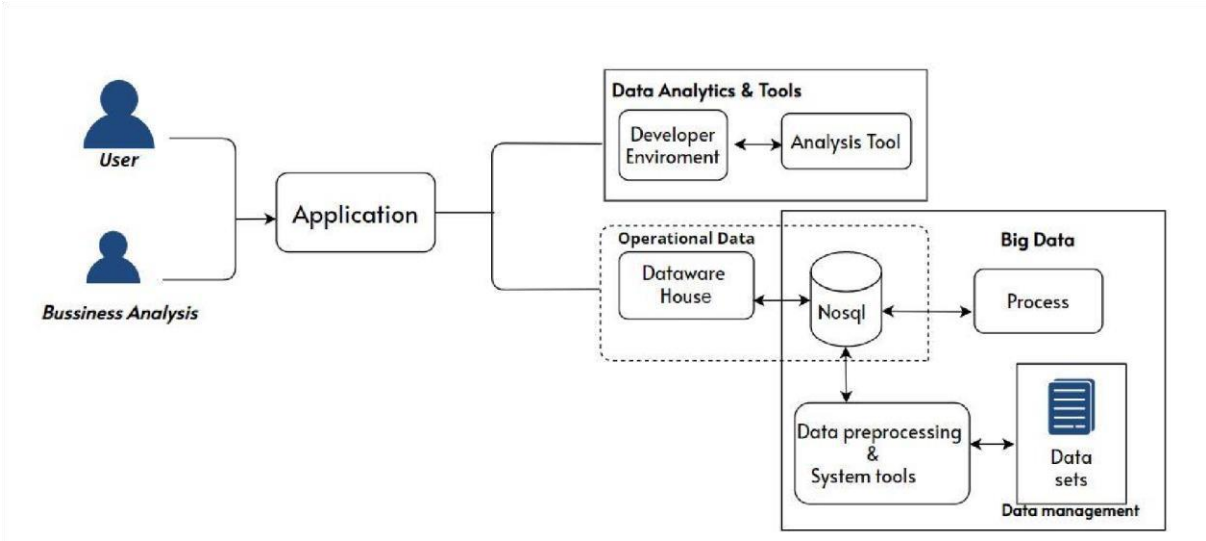
NFR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	It should be easier to understand the insights for the customers.
NFR-2	**Security**	The data is protected from unauthorized access.
NFR-3	**Reliability**	App could be run offline while server maintenance takes place. Server traffic would 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

5.1 Data Flow Diagrams



5.2 Solution & Technical Architecture



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile 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
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN-6	As a user, I can create the visualization by using the dashboard in the application		High	Sprint-3
Customer (Web user)	Login	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 and dashboard	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer Care Executive	Chat box	USN-1	It can be used by easily access and responsible.	I can access by easily through application	High	Sprint-2
Administrator	Calling	USN-2	It can be used by easily access and responsible.	I can access by easily through application	High	Sprint-2
	Mail	USN-3	It can be used by easily access and responsible	I can access by easily through application	High	Sprint-1

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	user can register for the application by entering my email and password	1	High	KOMALA P
Sprint-1	Registration	USN-2	User will receive email if the registration is successful. That the registration has conformed	1	High	KOMALA P
Sprint-2	Registration	USN-3	As a user, I can register by any browser.	2	Low	ASHWIN S
Sprint-1	Data extract	USN-4	As a user, I can extract data	1	Medium	ASHWIN S
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	2	High	GOKULAKRISHNAN R
Sprint-2	Dashboard	USN-6	I can access the dashboard of mine.	1	Medium	HARISH KUMAR Y
Sprint-1	Activity	USN-7	I can register for the application through any web browser.	1	low	GOKULAKRISHNAN R
Sprint-1	Access resources	USN-8	I can use my credentials For accessing my resources.	1	high	ASHWIN S
Sprint-2	Set events	USN-9	As, a user I can schedule events and set events.	1	high	KOMALA P
Sprint-3	Tools	USN-10	I can perform analysis by tools (cognos and with ML)	1	high	KOMALA P

6.2 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	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

7. CODING & SOLUTIONING (Explain the features added in the project along with code)

7.1 Feature

We have used many visualizations type like ➢

For comparison:

- Bar and column
- Bullet
- Line
- Radar
- Word cloud

➢ Parts to whole:

- Pie chart
- Tree map

➢ Trend:

- Box plot
- Line and column

- Relationships
  - Scatter
- Tables and summary
  - Crosstab
  - Summary

➢ Geospatial

- Legacy map
- Map

7.2 Database Schema (if Applicable)

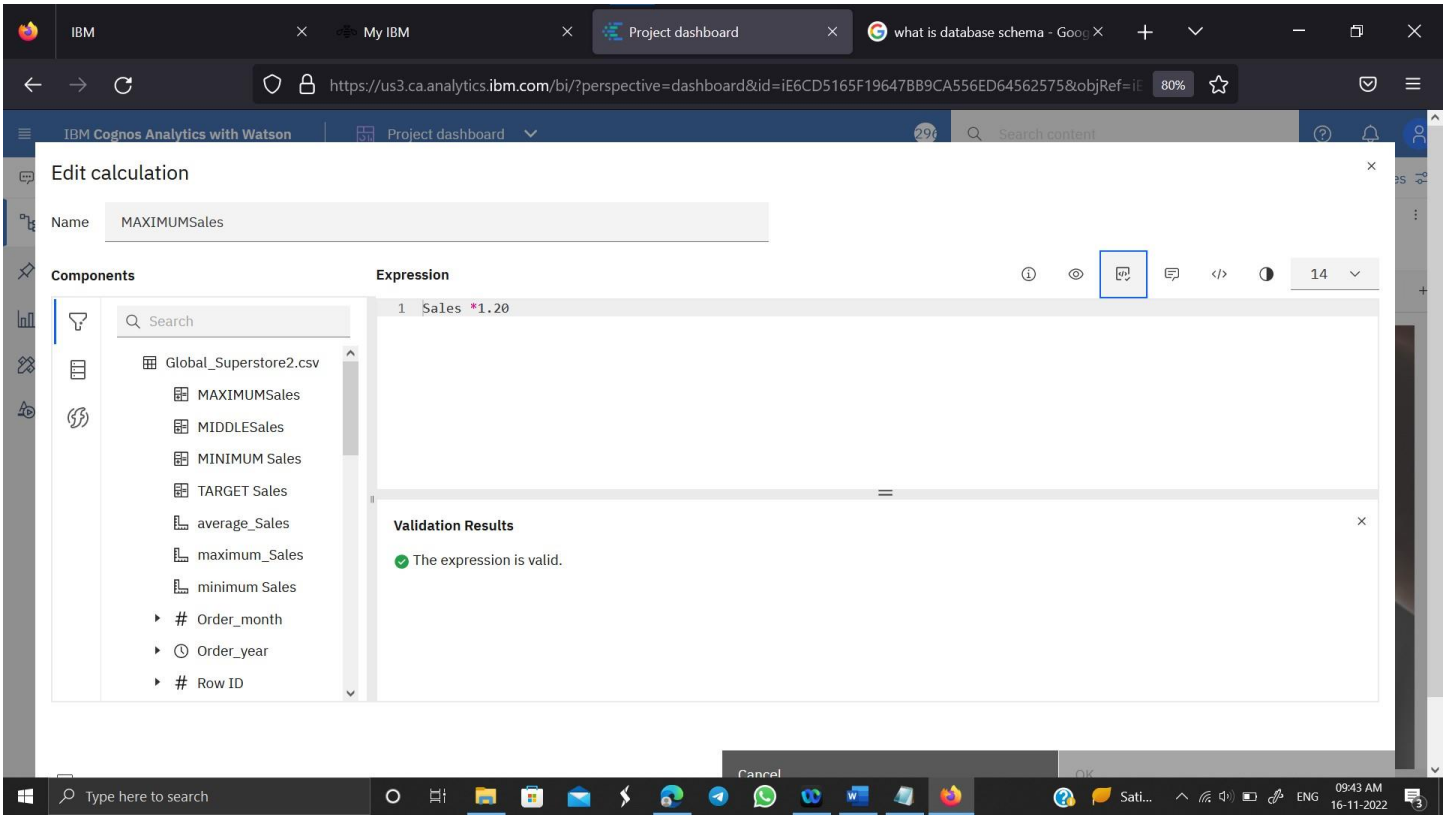
Build the following visualizations

1. Global Stuperstore_Data Upload.
2. Global Superstore_DataPrep.
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 TreeMap 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.

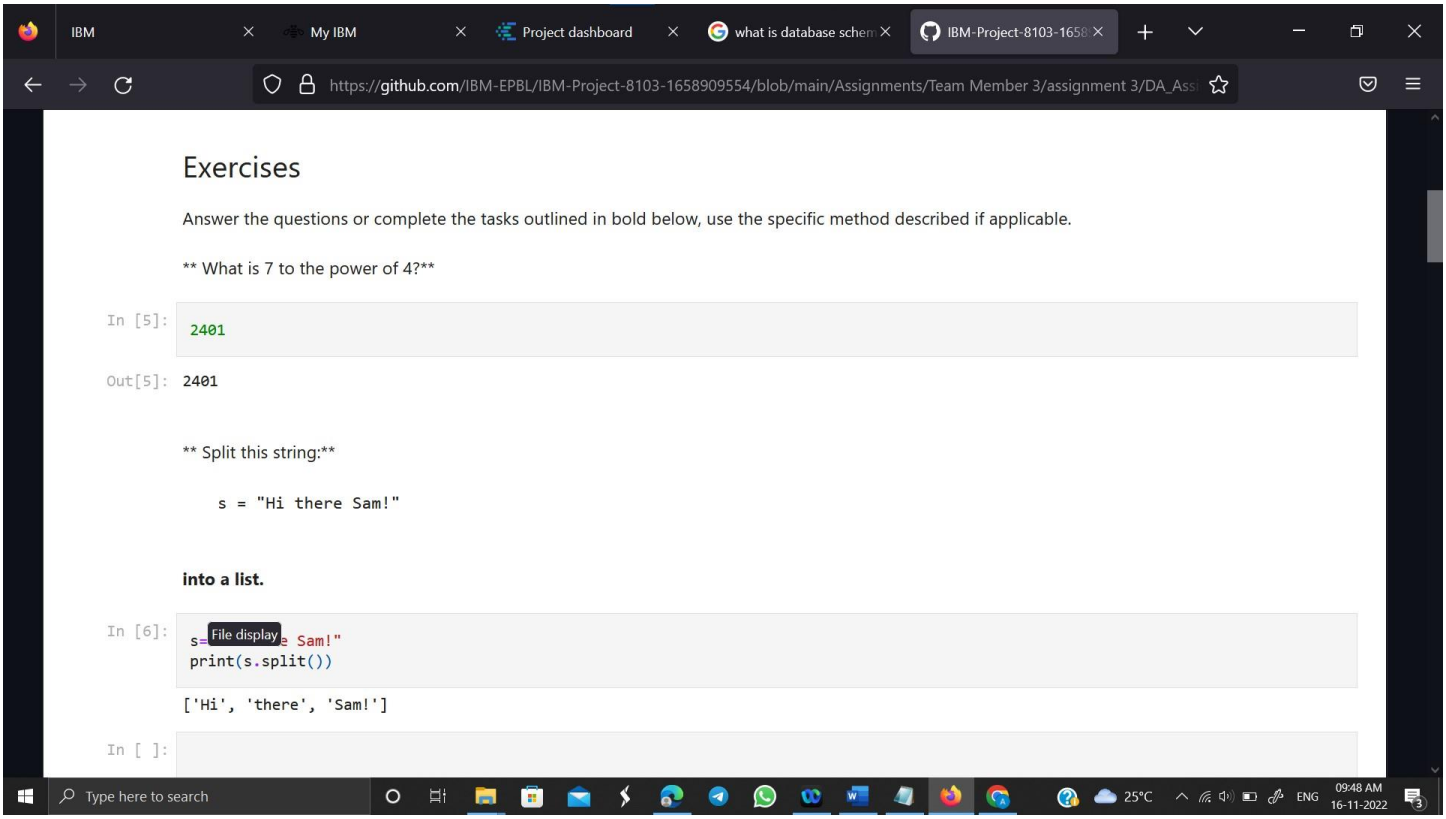
9. Present Sales (Bar), Profit (line) by Sub-Category using Line and Column Chart.
10. Sales vs Profit Scatter Plot with Sub-Category points and Region in Colour.
11. Sales and Profit Forecast by Month Country as Region and Region as Filter.
12. Sales vs Profit forecast by Month by Order Priority.
13. 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.

8. TESTING

8.1 Test Cases



Every expression is validated before calculation.



9. RESULTS

9.1 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.

10. 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.

11. CONCLUSION

Creating this dashboard will help understand customers will So that purchasing power will increase and will be beneficiary for both retailers and consumers.

12. FUTURE SCOPE

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 in future also.

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

13. APPENDIX

GitHub: **IBM-Project-24869-1659950361**