Global Sales Data Analytics

Team ID: PNT2022TMID46131

Bachelor of Engineering in Computer Science and Engineering



Dhanalakshimi Srinivasan Institute of Technology Samayapuram , Trichy -621112



ANNA UNIVERSITY : CHENNAI 600 025 NOVEMBER 2022

Faculty Evaluator: Mr.S.Sashikumar M.E., **Faculty Mentor**: Ms.R.Padmavathi M.E.,

Team members:-

Krishnaveni. B (815119104024) Vanisri. C (815119104046) Anandhi. V (815119104006) Keerthika .J (815119104021) We would like to express our special thanks of gratitude to our **Faculty Mentor** and **Industry Mentor** for their support and guidance in completing our project on the Smart Fashion Recommender Application

We would like to extend our gratitude to the IBM for Nalaiya Thiran project for providing us with all the facility that was required.

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

DATE: 17/11/2022

TEAM MEMBERS:

KRISHNAVENI B (815119104024) VANISRI C (815119104046) ANANDHI V (815119104006) KEERTHIKA J (815119104021)

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1. INDRODUCTION

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

2.1) 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.

2.2)Reference

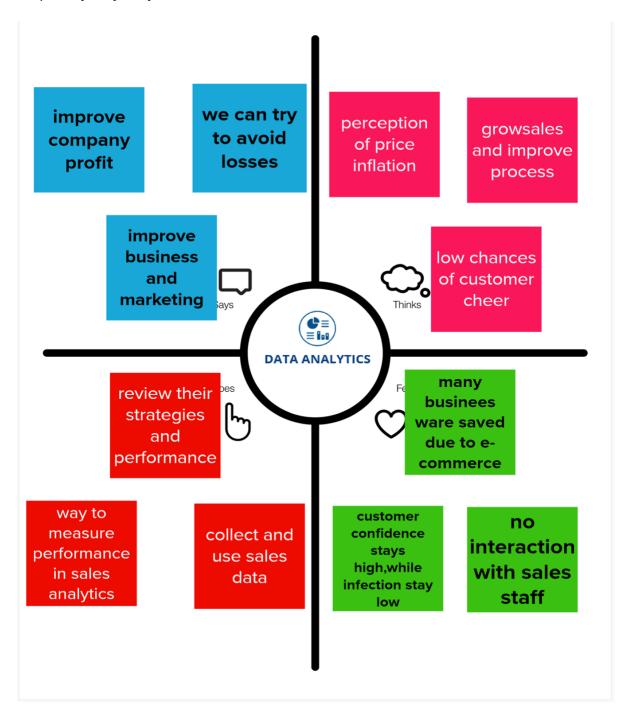
- 1.Data analysis and visualization of sales data 2016
- 2. Walmart's Sales Data Analysis A Big Data Analytics Perspective Dec2017
- 3. Research on Refined Sales Management, Data Analysis and Forecasting under Big

2.3) Problem Definition Statement

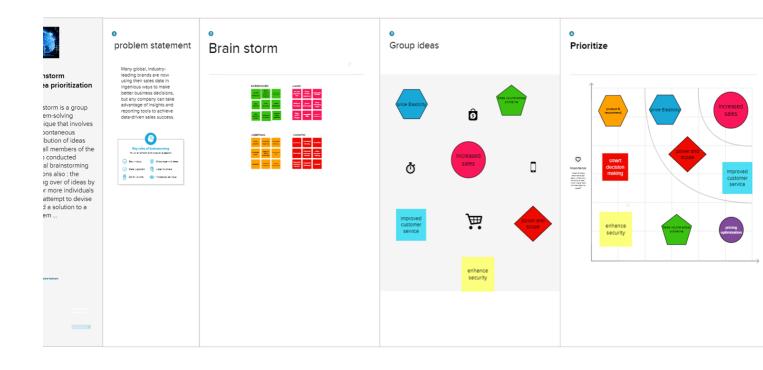
The overall purchase power of the consumer and also sales capacity of company. Unavailability of products equally between the consumers. There is no proper distribution of products among the customer The customers are not getting the products they prefer. By hearing out to the consumers and collecting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

3 IDEATION & PROPOSED SOLUTION

3.1) Empathy Map Canvas

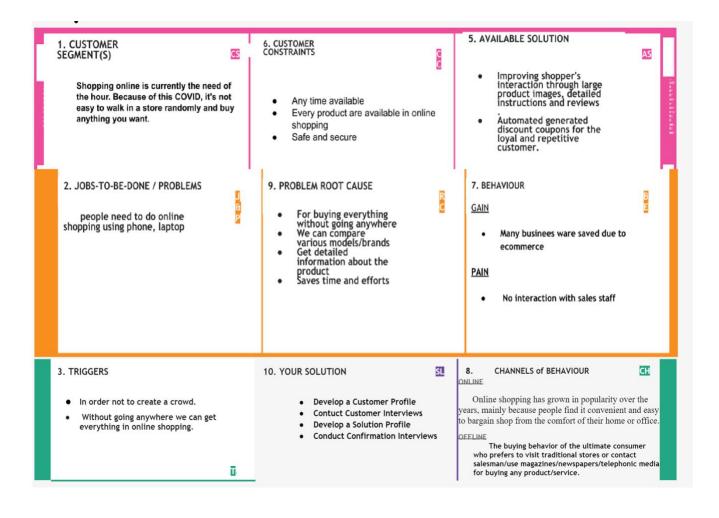


3.2) Ideation & Brainstorming



3.3)Proposed Solution

S.NO	Parameter	Description
1.	Problem Statement	As the world is
	(Problem to be solved)	the devastating situation and countries have
		been put under lockdown, restrictions have
		been imposed on going out of
		homes, arranging crowded events, going in
		markets, almost every business has been close
		down in the world in the wake
		of corona virus and people are stress to stay in
		homes. Hence people cannot go in markets for
		buying products, so this is
		probably pushing people to do online shopping.
		This research intends to investigate if Corona
		virus is pushing people do
		online shopping and it is also focused in this
		study to know if the people will continue doing
		Shopping online with the
		same rate as they are doing now when the
		markets are closed and they are also strictly
		barred from going In markets
2.	Idea/Solution	Use Data analytics –Global Sales data Analytics
	description	Application
		Mobile users abandon a website if it takes
		longer than 3 seconds to load E-commerce
		solutions are the products and services that help
		a company conduct business
		electronically.many e-commerce solutions
		providers now focus on offering a suite of
		products and services designed to meet multiple
		needs and solve various problems. Any business
		that wants to sell their products and services
		across the internet have to opt for ecommerce
		solutions to support their business at different
		stages. The working of ecommerce solutions
		totally depends on their offerings. It can be
		product-based as well as service-based.



4 REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENTS:

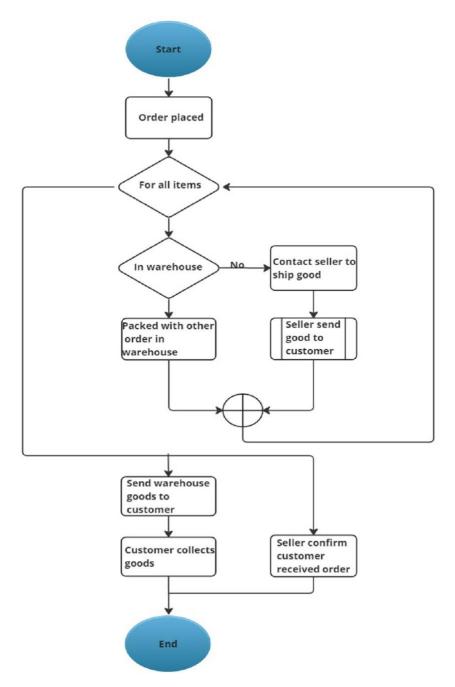
FR No.	Functional Requirement (Epic)	Sub Requirement (Story/Sub-Task)		
FR-1	User Registration	Registration through Form Registration through Gmail		
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP		
FR-3	User Login	Login via Email and password		
FR-4	User uploading data(administrative)	To store the data set through the cloud		
FR-5	End user benefits	Getting higher state of efficiency and also to know entire data analysis		

${\bf NON\text{-}FUNCTIONAL\ REQUIREMENTS:}$

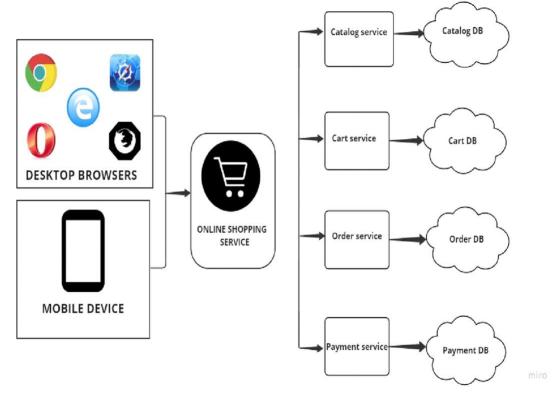
FR No.	Non-Functional Requirements	Requirements Description		
NFR-1	Usability	Optimized resources and it can be used by everyone		
NFR— 2	Security	It has securable because it has end to end encryption		
NFR-3	Reliability	It has high reliability based on development.		
NFR-4	Performance	It has high state of performance and efficiency.		
NFR-5	Availability	It has available in all platforms and websites.		
NFR— 6	Scalability	The ability of a hardware and software parallel System to exploit increasing computing resources efficiency in the analysis of the (very) large datasets		

5 PROJECT DESIGN

5.1)Data Flow Diagrams



5.2) Solution & Technical Architecture



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
Customer (Web user)	Dashboard	USN-6	As a web user I can easily understand the data with the help of dashboard	I can get information from /on the web	Medium	Sprint-1
Customer Care Executive	Explored data	USN-7	A customer care executive can get a explored data.	I can get a sorted ,segmented data for certain category	high	Sprint-1
Administrator	Visualization data	USN-8	As administration I would like to analyse the data of my company	I can easily make decision in my company development	high	Sprint-1

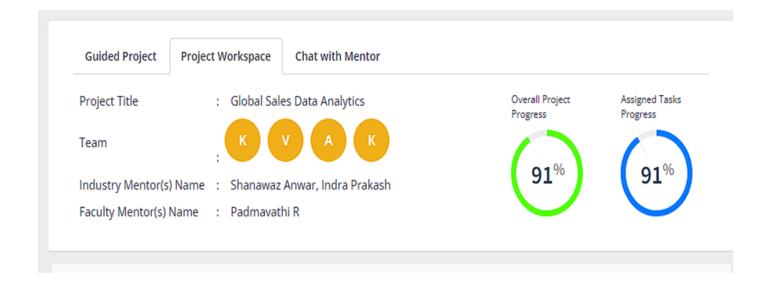
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 1	Registration	USN-1	As a user, I need valid credentials to log in to my software.	5	High	Krishna veni, Vanisri, Anandhi, Keerthika
Sprint 1	Data Preparation	USN-2	As a user, I need to upload my data to the software and the application must accept CSV/XLS files.	10	High	Krishna veni, Vanisri, Anandhi, Keerthika
Sprint 1	Data Preparation	USN-3	As a user, I must prepare my data in order to avoid discrepancies while visualizing.	5	High	Krishna veni, Vanisri, Anandhi, Keerthika

Sprint 2	Dashboard	USN-4	As a user, I want filters so that I can view particular statistics of the worldwide sales data in relation to appropriate profitability.	7	Medium	Krishna veni, Vanisri, Anandhi, Keerthika
Sprint 2	Dashboard	USN-5	As a user, I must plan visualizations in a way that I'm able to gain insights regarding the sales based upon the category of sales and the respective region.	7	Medium	Krishna veni, Vanisri, Anandhi, Keerthika
Sprint 2	Dashboard	USN-6	As a user, I must be able to gain insights from the charts/graphs through a variety of relationships established in the dashboard.	6	Medium	Krishna veni, Vanisri, Anandhi, Keerthika
Sprint 3	Report	-	Report Generation	20	Low	Krishna veni, Vanisri, Anandhi, Keerthika
Sprint 3	Story	-	Story Preperation	20	Low	Krishna veni, Vanisri, Anandhi, Keerthika

Project Tracker, Velocity & Burn down Chart: (4 Marks)

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	29-10-2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022		
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022		
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022		

6.3)Reports from JIRA



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.

7.1)Features 1: INDEX.HTML:

<!DOCTYPE html> <html lang="en"> <head>

```
<title>Webpage Design</title>
  <link rel="stylesheet" href="style.css">
</head>
<body>
</body>
  <div class="center"></div>
  <div class="main">
   <div class="navbar">
     <div class="icon">
       <h2 class="logo">IBM </h2>
     </div>
     <div class="menu">
       <a target="_blank" href="">HOME</a>
         <a target="_blank" href="/about page.html">ABOUT</a>
         <a target=" blank" href="/dashboard.html">DASHBPOARD</a>
         <a target="_blank" href="/report.html">REPORT</a>
         <a target="_blank" href="/story.html">STORY</a>
         <a target="_blank" href="https://github.com/IBM-EPBL/IBM-Project-29883-</li>
1660132189">GITHUB</a>
         <a target="_blank" href="/team.html">TEAM</a>
       </div>
   </div>
    <div class="content">
     <h1>Global Sale <br><span>Data</span> <br>Analytics</h1></br>
       <button class="cn"><a href="#">JOIN US</a></button>
       </div>
         </div>
       </div>
   </div>
  </div>
  <script src="https://unpkg.com/ionicons@5.4.0/dist/ionicons.js"></script>
</body>
</html>
```

7.2) Features 2:

```
STYLE.CSS:
     *{
  margin: 0;
  padding: 0;
}
.main{
  width: 100%;
  background: linear-gradient(to top, rgba(0,0,0,0.5)50%,rgba(0,0,0,0.5)50%), url(Analytics.jpg)
  background-position: center;
  background-size: cover;
  height: 100vh;
}
.navbar{
  width: 1200px;
  height: 75px;
  margin: auto;
  background-color: rgb(12, 20, 16);
}
.icon{
  width: 200px;
  float: left;
  height: 70px;
  box-shadow: #00ccff;
}
.logo{
  color: hsl(256, 89%, 45%);
  font-size: 35px;
  font-family: Arial;
  padding-left: 20px;
  float: left;
  padding-top: 10px;
  margin-top: 5px
}
.menu{
  width: 400px;
  float: left;
  height: 70px;
}
ul{
  float: left;
  display: flex;
  justify-content: center;
```

```
align-items: center;
}
ul li{
  list-style: none;
  margin-left: 62px;
  margin-top: 27px;
  font-size: 14px;
}
ul li a{
  text-decoration: none;
  color: #fff;
  font-family: Arial;
  font-weight: bold;
  transition: 0.4s ease-in-out;
}
ul li a:hover{
  color: #0690e7;
  text-align: center;
.btn:hover{
  color: #000;
}
.btn:focus{
  outline: none;
}
.srch:focus{
  outline: none;
.content{
  width: 1200px;
  height: auto;
  margin: auto;
  color: rgb(245, 8, 8);
  position: relative;
}
.content .par{
  padding-left: 20px;
```

```
padding-bottom: 25px;
  font-family: Arial;
  letter-spacing: 1.2px;
  line-height: 30px;
}
.content h1{
  font-family: 'Times New Roman';
  font-size: 50px;
  padding-left: 20px;
  margin-top: 9%;
  letter-spacing: 2px;
}
.content .cn{
  width: 160px;
  height: 40px;
  background: #dadbf3;
  border: none;
  margin-bottom: 10px;
  margin-left: 20px;
  font-size: 18px;
  border-radius: 10px;
  cursor: pointer;
  transition: .4s ease;
}
.content .cn a{
  text-decoration: none;
  color: #000;
  transition: .3s ease;
}
.cn:hover{
  background-color: #fff;
}
.content span{
  color: #ff7200;
  font-size: 65px
}
.form{
  width: 250px;
  height: 380px;
  background: linear-gradient(to top, rgba(0,0,0,0.8)50%,rgba(0,0,0,0.8)50%);
  position: absolute;
  top: -20px;
  left: 870px;
```

```
transform: translate(0%,-5%);
  border-radius: 10px;
  padding: 25px;
.form h2{
  width: 220px;
  font-family: sans-serif;
  text-align: center;
  color: #ff7200;
  font-size: 22px;
  background-color: #fff;
  border-radius: 10px;
  margin: 2px;
  padding: 8px;
}
.form input{
  width: 240px;
  height: 35px;
  background: transparent;
  border-bottom: 1px solid #ff7200;
  border-top: none;
  border-right: none;
  border-left: none;
  color: #fff;
  font-size: 15px;
  letter-spacing: 1px;
  margin-top: 30px;
  font-family: sans-serif;
}
.form input:focus{
  outline: none;
}
::placeholder{
  color: #fff;
  font-family: Arial;
}
.btnn{
  width: 240px;
  height: 40px;
  background: #ff7200;
  border: none;
  margin-top: 30px;
  font-size: 18px;
  border-radius: 10px;
  cursor: pointer;
```

```
color: #fff;
  transition: 0.4s ease;
}
.btnn:hover{
  background: #fff;
  color: #ff7200;
}
.btnn a{
  text-decoration: none;
  color: #000;
  font-weight: bold;
}
.liw{
  padding-top: 15px;
  padding-bottom: 10px;
  text-align: center;
}
.icons a{
  text-decoration: none;
  color: #fff;
}
.icons ion-icon{
  color: #fff;
  font-size: 30px;
  padding-left: 14px;
  padding-top: 5px;
  transition: 0.3s ease;
}
ABOUT .HTML:
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>about page</title><style>body {background-color: rgb(233, 239, 240);}
    h1 {color: rgb(243, 243, 245);}</style>
</h/ead>
<body>
  <style>
    body {
     background-image: url('gsda.jpg');
     background-repeat: no-repeat;
```

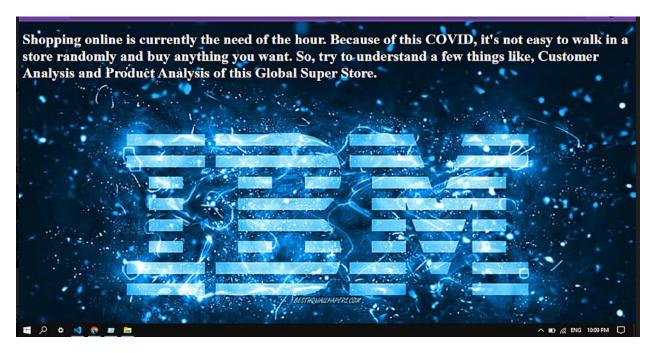
```
background-attachment: fixed;
    background-size: cover;
   }
   </style>
  <h1>Shopping online is currently the need of the hour. Because of this COVID, it's not easy to walk
   in a store randomly and buy anything you want. So, try to understand a few things like, Customer
   Analysis and Product Analysis of this Global Super Store.
  </h1>
</body>
</html>
DASHBOARD DESIGN:
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>DASHBOARD PAGE</title>
</head>
<body>
  <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%
2Fdataset%2Bfrom%2Bibm%2Fdemo%2Bdashboard&closeWindowOnLastView=true&amp
;ui appbar=false&ui navbar=false&shareMode=embedded&action=view&
mode=dashboard&subView=model0000018483ed14d9 00000000"
  width="80%" height="600px" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
</body>
</html>
REPORT.HTML:
   <!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>REPORT PAGE</title>
</head>
<body>
```

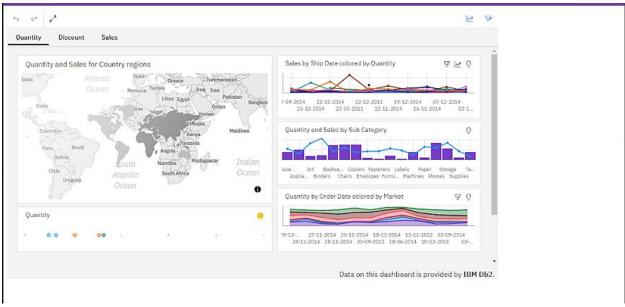
```
<iframe
src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Fdataset%2Bfrom%2Bibm%2FNew%2Brep
ort&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=em
bedded&action=run&format=HTML&prompt=false"
  width="80%" height="600px" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
  <br>
  <br>
  <iframe
src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Fdataset%2Bfrom%2Bibm%2FNew%2Brep
ort2&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=e
mbedded&action=run&format=HTML&prompt=false"
  width="80%" height="600px" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
  <br>
  <br>
  <br>
  <br>
</body>
</html>
STORY.HTML:
   <!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>STORY PAGE</title>
</head>
<body>
  <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FNew%2Bstory&a
mp;closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedde
d&action=view&sceneId=model0000018489e6df0e_00000000&sceneTime=0"
  width="80%" height="600px" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
</body>
</html>
```

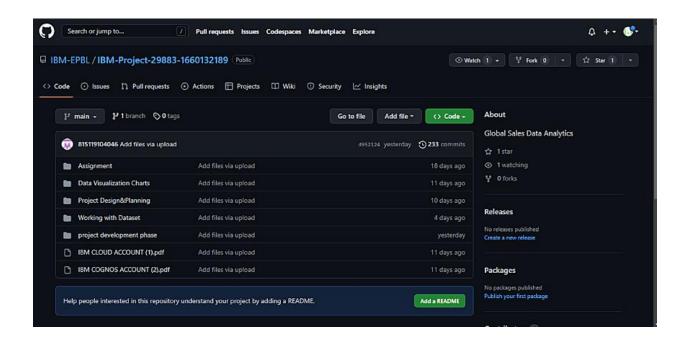
TEAM.HTML:

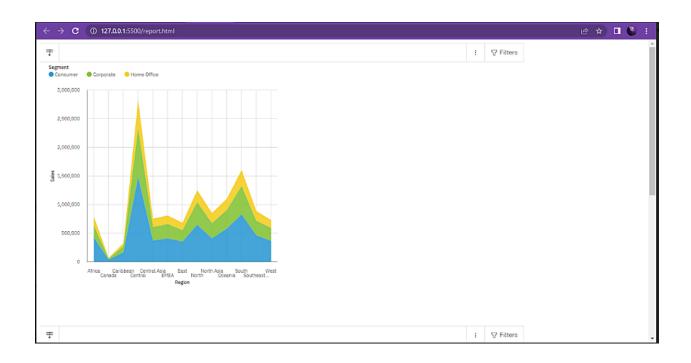
```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>about page</title>
</head>
<style>body {background-color: rgb(160, 28, 221);}</style>
<body>
  <h1 style="text-align:center;"><u>TEAM</u></h1>
  <h1 style="color:rgb(159, 161, 29);" ><u> LEADER:</u></h1>
  <h2>NAME:Krishna veni.B<br>
ID: krishnavenibcse@gmail.com</h2>
  <h1 style="color:rgb(159, 161, 29);" ><u>TEAM MEMBER 1:</u></h1>
  <h2>NAME:Vani sri.C<br>
  MAIL ID:vanisricse13@gmail.com</h2>
  <h1 style="color:rgb(159, 161,29);"><u>TEAM MEMBER 2:</u></h1>
  <h2>NAME:Anandhi.V<br>
  MAIL ID:av7576777@gmail.com</h2>
  <h1 style="color: rgb(159, 161, 29);"><u>TEAM MEMBER 3:</u></h1>
  <h2>NAME:Keerthika.J<br>
   MAIL ID:keerthikak196@gmail.com</h2>
</body>
</html>
```

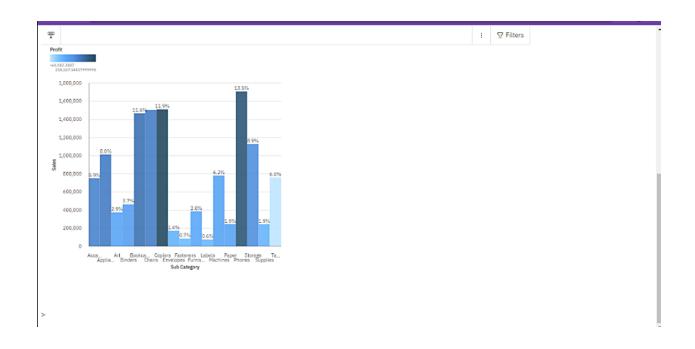
8.RESULT:

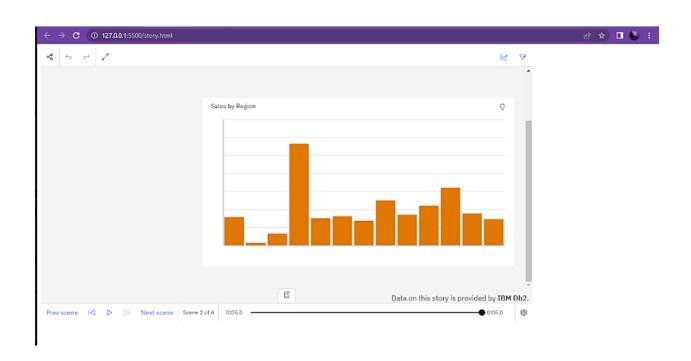


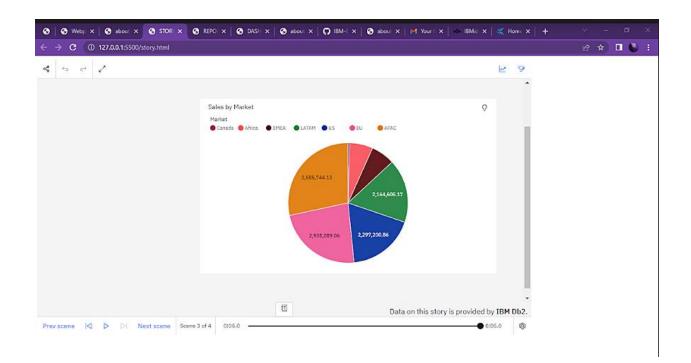


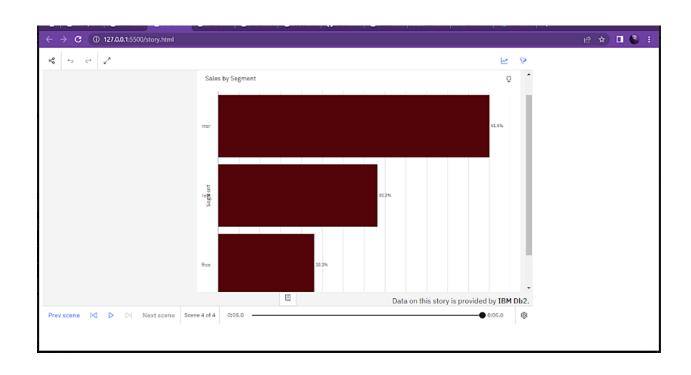


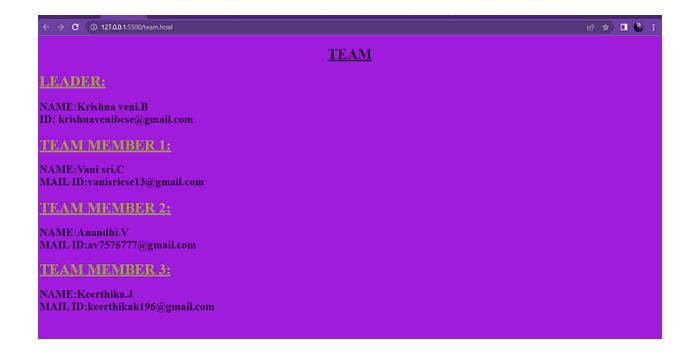












9.ADVANTAGES & DISADVANTAGES

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 in future 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

12.APPENDIX:

12.1)Source Code:

#install kaggle !pip install -q kaggle

from google.colab import files files.upload()

!kaggle datasets download -d apoorvaappz/global-super-store-dataset

Downloading global-super-store-dataset.zip to /content 72% 8.00M/11.1M [00:01<00:00, 13.0MB/s] 100% 11.1M/11.1M [00:01<00:00, 10.2MB/s]

!unzip global-super-store-dataset.zip

Archive: global-super-store-dataset.zip inflating: Global_Superstore2.csv inflating: Global_Superstore2.xlsx

import numpy as np import pandas as pd import seaborn as sb from matplotlib import pyplot as plt import sklearn

GLOBAL SALES DATA ANALYTICS df=pd.read_csv('Global.csv', encoding='latin-1') df

df.head()

df.tail()

DESCRIBE THE EXCEL df.describe()

GET THE NUMBER OF ROWS AND COLUMNS df.shape

REMOVE THE ROWS THAT CONTAINS NULL VALUES df.dropna()

THESE ROWS HAD CELLS WITH EMPTY VALUES REMOVED dat=df emp=dat.dropna(inplace = True) print(dat.to_string)

FINDING DUPLICATES print(df.duplicated())

REMOVING DUPLICATES

df.drop_duplicates(inplace = True)
print(df.to_string())

sb.kdeplot(dat.Sales)

sb.kdeplot(dat.Quantity)

sb.kdeplot(dat.Discount)
sb.kdeplot(dat.Profit)
sb.pairplot(dat)

12.2).GITHUB &PROJECT DEMO LINK: https://drive.google.com/file/d/1dvGjr98p8g7gY6LyxDGfb3m1GEMOKNXA/view?usp= drivesdk