Project Report

Global Sales Data Analytics

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 into 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.

1.2 purpose

The purpose of the project is to perform data visualization and create interactive dashboards to visualize the customer and product analysis. This will help to have an idea about the sales and the market value of the company.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

Abstract

 The Covid-19 Pandemic has bought a paradigm shift in the buying behaviour of consumers. It is responsible for breaking the stereotype in the market trend. This paper tries to understand the change in consumer buying behaviour during the lockdown caused due to Covid-19 pandemic. The traditional offline shopping habits of the consumers were replaced by online shopping It was also seen that the usual attraction of consumers concerning promotional offers and discounts on products did not affect their buying behaviour. The results of the study reveal that consumers preferred buying essential items mostly online mode of shopping.

Keywords: Covid-19, Consumer Goods, Consumer Behaviour, product trends, Online Shopping, Pandemic.

Introduction

The world was hit by a novel coronavirus in March 2019, which resulted in a global crisis (Dr Chandan Thakur, et.al. 2020). The infection was spreading very fast and to control the spread of

the disease, the government declared a lockdown across the country. Due to the lockdown, people had to stay at home and followed social distancing norms whenever they go out. A complete lockdown was announced in India from 23rd March 2019 onwards and hence most of the businesses, trade, and industries were completely shut down (Gaurav Shetty, et.al. 2020). During this lockdown situation, people were following work from a home patterns. Consumers did not have the flexibility to buy things whenever and wherever they needed them. This brought a change in consumer buying behaviour to a large extent. The lack of vaccines and changing norms forced people to prefer buying online rather than waiting in long queues at the supermarket and risking their lives. However, to sustain in this crisis, consumers started to buy what they need and started storing them in bulk due to panic. Panic buying is an act of holding necessary goods in bulk quantities, to avoid any deficiency in the future. Panic buying behaviour of customers as a response to the stress caused by the crisis, Shadiqi et al., (2020). As the COVID-19 pandemic was continuing, consumers witnessed this as an alarming situation and panic buying emerged as a quite obvious phenomenon. Though E-commerce had gained impetus even before Covid-19 hit, the pandemic pushed it even more by accelerating online revenue (digital commerce 360). This study takes a look into the changing consumer behaviour during the lockdown period. It also gives an insight into the type of goods that the consumers ordered and the increase in online shopping/global sales due to the impact of Covid-19. The results of the study are discussed based on the evaluation of the changes in consumer behaviour and increase in global sales due to the impact of the Covid-19 pandemic.

Literature Review

Covid 19

The consequences of the pandemic Covid-19 had an impact on the health as well as the economy of the country. Due to the lockdown situation, self-isolation, home quarantine, social distancing, and strict use of masks were followed due to the contagious nature of the disease. COVID-19 has a nationwide impact, especially on the business (Gaurav Shetty et al. 2018).

Online Buying

Due to Covid -19 pandemic and subsequent lockdown, online shopping has become convenient, safe, and attractive (Ali, Bayad, 2020). A study contributed to understanding the trends and impact of covid19 on consumers right from baby boomers to the X and Y generations especially related to online shopping behaviour (Ludvík Eger, et. Al, 2021). According to research in Italy, online shopping was the best option during the epidemic as it helped the customers to buy necessary products and prevented them from the risk spreading of the disease. (Forster & Tang, 2005).

Consumer Behaviour towards online shopping during covid-19

According to a blog on the impact of covid-19 on consumer behaviour, the impact on shopping behaviour raged up in early March. This impact eventually declined, as the supply chain improved, and panic buying decreased. According to Numerator Insights data (2021), shoppers mostly placed online orders. The overall level of consumer concern related to Coronavirus reached its highest levels in late March 2020. Some consumers mentioned baking, cooking, and consuming food & drinks at home more frequently than they did pre-COVID.

Objectives:

- To understand the change in consumer buying behaviour, from Offline to Online, during the lockdown caused due to Covid-19 pandemic.

- To understand the change in product buying and assess which products are frequently bought.

- To understand which products are making a profit and in which countries the sales are more.

- To identify the most purchased goods and trends in the buying of products bought during the Covid-19 lockdown.

Conclusion

Around the globe, electronic buying will be bright in the coming time. After COVID-19 in India, the attitude towards online shopping is getting better. The Covid-19 pandemic has encouraged online shopping activities of consumers more active. Now a day, E-shopping becomes a better source in this situation of Coronavirus, and E-retailers supply products that are normally purchased in the supermarket by consumers, and this increases our all-global sales of products and the satisfaction of Customers.

2.2 REFERENCES

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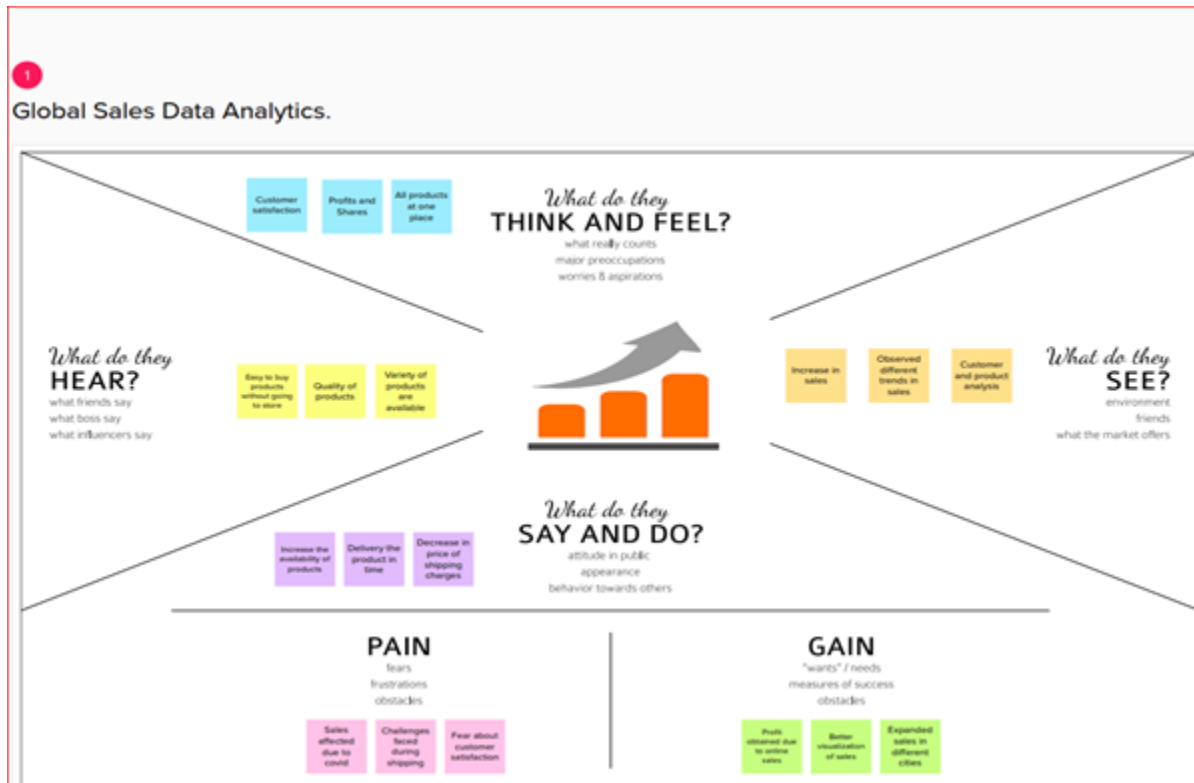
2.3 PROBLEM STATEMENT DEFINITION

Most of the Sales have been done online during the pandemic covid-19.

So, the project is mainly to perform customer analysis and product analysis of the global superstore and create visualization and dashboards using IBM Cognos analytics.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

3.2 IDEATION AND BRAINSTORMING

3.3 PROPOSED SOLUTION

These solution templates relate the current situation to the desired result
of this project and describe the benefits acquire when the desired result is
achieved.

1.	Problem Statement (Problem to be solved)	To perform customer analysis and product analysis of the global superstore and create visualization and dashboards using IBM Cognos analytics.
2.	Idea / Solution description	By analysing the given data, we will get to know about the impact of various parameters on global sales through which we can create interactive dashboards.
3.	Novelty / Uniqueness	Performs customer and product analysis and creates interactive dashboards where it provides insights for the customers and insights for the company which helps increase sales.
4.	Social Impact / Customer Satisfaction	Customer satisfaction depends upon various factors like availability of the product, easy access, transportation facilities, etc.
5.	Business Model (Revenue Model)	By performing analysis, we come to know about various factors that impact on revenue of the company, and it also talks about market value and global reach.
6.	Scalability of the Solution	As it is an interactive dashboard it is easily adaptable to changes.

3.4 PROBLEM-SOLUTION FIT

Problem-Solution fit canvas 2.0   Purpose / Vision

1. CUSTOMER SEGMENT(S) `CS` Who is your customer? i.e. working parents of 0-5 y.o. kids Online buyers	**6. CUSTOMER CONSTRAINTS** `CC` What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices. Lack of physical stores and fear of covid.

5. AVAILABLE SOLUTIONS   `AS`
Which solutions are available to the customers when they face the problem
or need to get the job done? What have they tried in the past? What pros & cons do
these solutions have? i.e. pen and paper is an alternative to digital notetaking

Home delivery of the product from nearby stores

Define CS, fit into CC — *Explore AS, differentiate*

2. JOBS-TO-BE-DONE / PROBLEMS   `J&P`
Which jobs-to-be-done (or problems) do you address for your customers?
There could be more than one, explore different sides.

Create multiple analytical graphs/charts/
visualizations and create dashboard in IBM
cognos analytics.

9. PROBLEM ROOT CAUSE   `RC`
What is the real reason that this problem exists?
What is the back story behind the need to do this job?
i.e. customers have to do it because of the change in regulations.

1. Covid restrictions
2. Lack of availability of products.
3. All products at one place.
4. Better discounts.

7. BEHAVIOUR   `BE`
What does your customer do to address the problem and get the job done?
i.e. directly related: find the right solar panel installer, calculate usage and benefits;
indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

1. Look for good quality products among available.
2. Consider ratings and reviews from other
   customers.
3. Tie up with the local shops available

Focus on J&P, tap into BE, understand RC — *Focus on J&P, tap into BE, understand RC*

3. TRIGGERS   `TR`
What triggers customers to act? i.e. seeing their neighbour installing
solar panels, reading about a more efficient solution in the news.

Due to prevailing covid situations.

10. YOUR SOLUTION   `SL`
If you are working on an existing business, write down your current solution first,
fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill in
the canvas and come up with a solution that fits within customer limitations,
solves a problem and matches customer behaviour.

To create an interactive dashboard to visualize
and predict market sales and trends using the
available global superstore dataset.

8. CHANNELS of BEHAVIOUR   `CH`
8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

Look for available products, cost, discounts,
delivery time and charges.

4. EMOTIONS: BEFORE / AFTER   `EM`
How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure = confident, in control - use it in your communication strategy & design.

Fear-> satisfied, peace of mind

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7
and use them for customer development.

Check the quality of product

Identify strong TR & EM — *Extract online & offline CH of BE*

4. REQUIREMENT ANALYSIS

4.1 Functional requirements

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form
FR-2	User Login	Log in via username and password.
FR-3	Data Pre-processing	Remove the duplicate values and fill in the missing values
FR-4	Tools for Visualization	IBM Cognos Analytics.
FR-5	Prepare dashboards	Dashboards, storyboards, and reports are created in IBM Cognos Analytics.

4.2 Non-Functional requirements

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The interactive dashboard can make easily understand the data report.
NFR-2	Security	IBM Cognos platform has secure user information.
NFR-3	Reliability	We use IBM Cognos Analytics for development which is reliable.
NFR-4	Performance	Interaction makes better performance between all users.
NFR-5	Availability	It is available on all platforms and websites.
NFR-6	Scalability	As it is an interactive dashboard it is easily adaptable to changes.

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

Data Flow Diagrams: A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

STRUCTURAL FLOW DIAGRAM

DATA FLOW DIAGRAM FOR GLOBAL SALES DATA ANALYTICS:
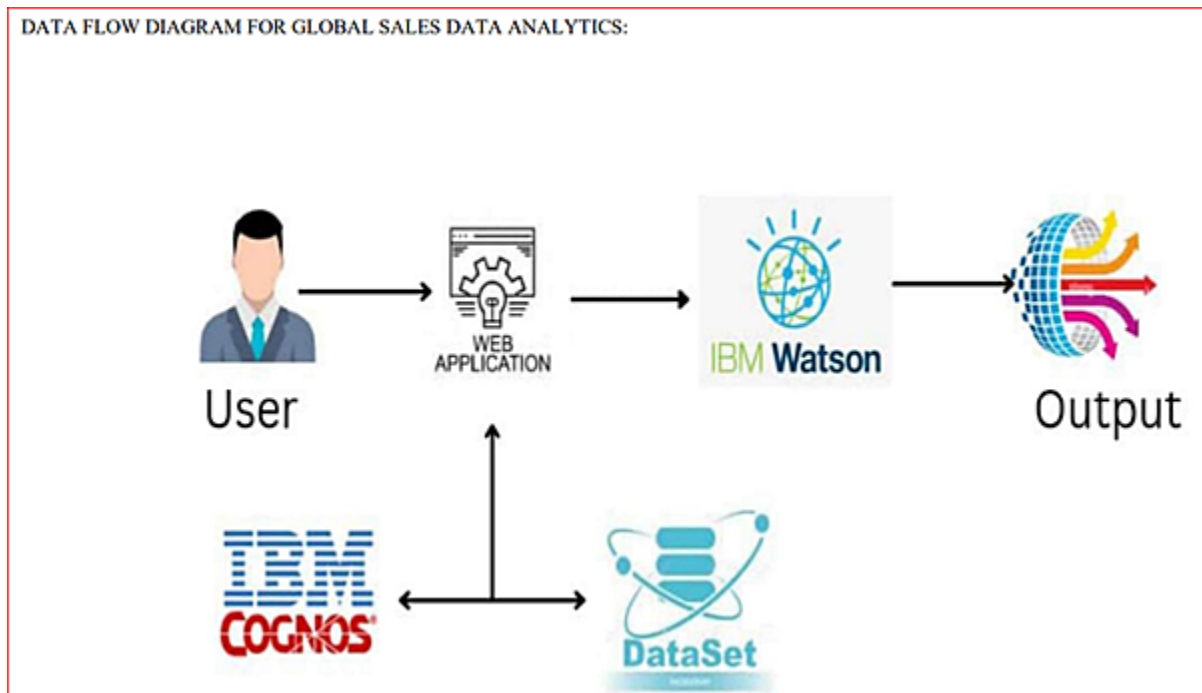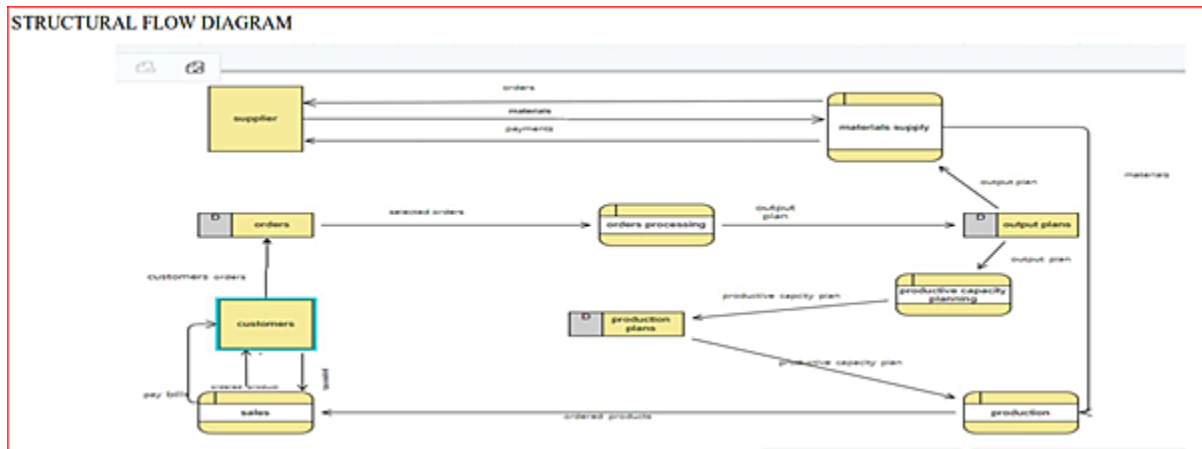
5.2 SOLUTION AND TECHNICAL ARCHITECTURE

SOLUTION ARCHITECTURE

DATASET

DATA PREPROCESSING

ProjectPro

IBM
Cognos
Analytics

DASHBOARD

USERS

Technical Architecture:
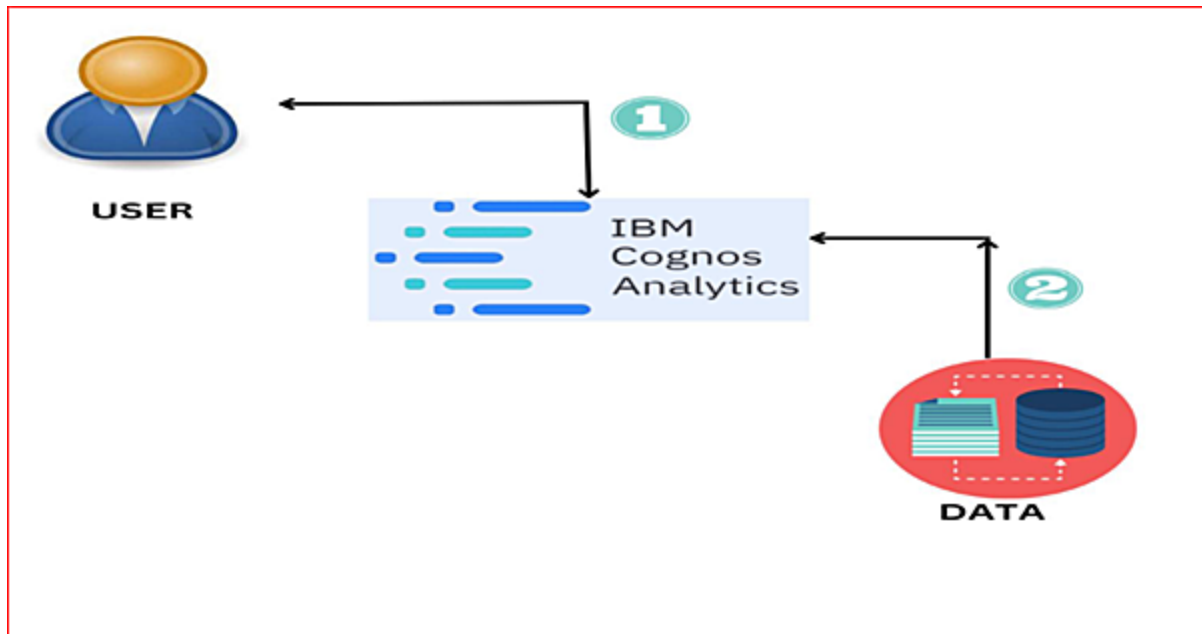
5.3 User Stories

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 Username, and password, and confirming my password.	I can access my account/dashboard	Medium	Sprint-4
		USN-2	As a user, I can register for the application through Form	I can register & access the dashboard with Login details	Medium	Sprint-4
	Login	USN-3	As a user, I can log into the application by entering my Username & password		Medium	Sprint-4
	Dashboard	USN-4	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 username, and password and confirming me password	I can access my account and dashboard	Medium	Sprint-4

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	Calling	USN-2	It can be used by easy access and responsible.	I can access by easily through the application	Medium	Sprint-4
	Mail	USN-3	It can be used by easily accessing and responsible	I can access by easily through the application	Medium	Sprint-4

6.PROJECT PLANNING & SCHEDULING:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Acquisition	USN-1	Loading the Data set Pre-processing the data	2	Medium	Sannapaneni Kundan Sai Chowdary Pavan Kumar Malasani Swapna T Bhumireddy Nandini
		USN-2	Launching IBM Cognos Checking the visualizations	1	Medium	
Sprint-2	Data Visualization	USN-3	IBM Visualizations	2	High	Sannapaneni Kundan Sai Chowdary Pavan Kumar Malasani Swapna T Bhumireddy Nandini
		USN-3	Python Visualizations	2	Medium	
Sprint-3	Dashboard Creation	USN-5	Create IBM Dashboard	1	High	Sannapaneni Kundan Sai Chowdary Pavan Kumar Malasani Swapna T Bhumireddy Nandini
		USN-6	Create IBM Report	1	Medium	
		USN-7	Create IBM Storyboard	1	Medium	
Sprint-4	Exploration of data and Website Creation	USN-8	Export all the analysis	1	High	Sannapaneni Kundan Sai Chowdary Pavan Kumar Malasani Swapna T Bhumireddy Nandini
		USN-9	Website Login	1	Medium	

		USN-10	Home page & Contact page creation	1	Low	
		USN-11	Linking With Website	3	High	

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	3	7 Days	23 Oct 2022	29 Oct 2022	3	29 Oct 2022
Sprint-2	4	7 Days	30 Oct 2022	05 Nov 2022	4	05 Nov 2022
Sprint-3	3	7 Days	06 Nov 2022	12 Nov 2022	3	12 Nov 2022
Sprint-4	6	7 Days	13 Nov 2022	19 Nov 2022	6	19 Nov 2022

Burndown Chart:

A burn-down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn-down charts can be applied to any project containing measurable progress over time

Burndown Chart

Estimated Effort
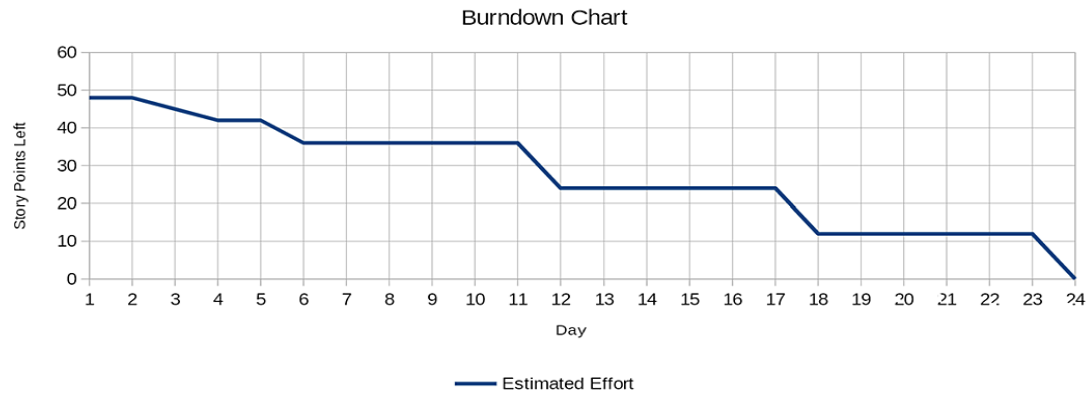
6.3 Reports from jira
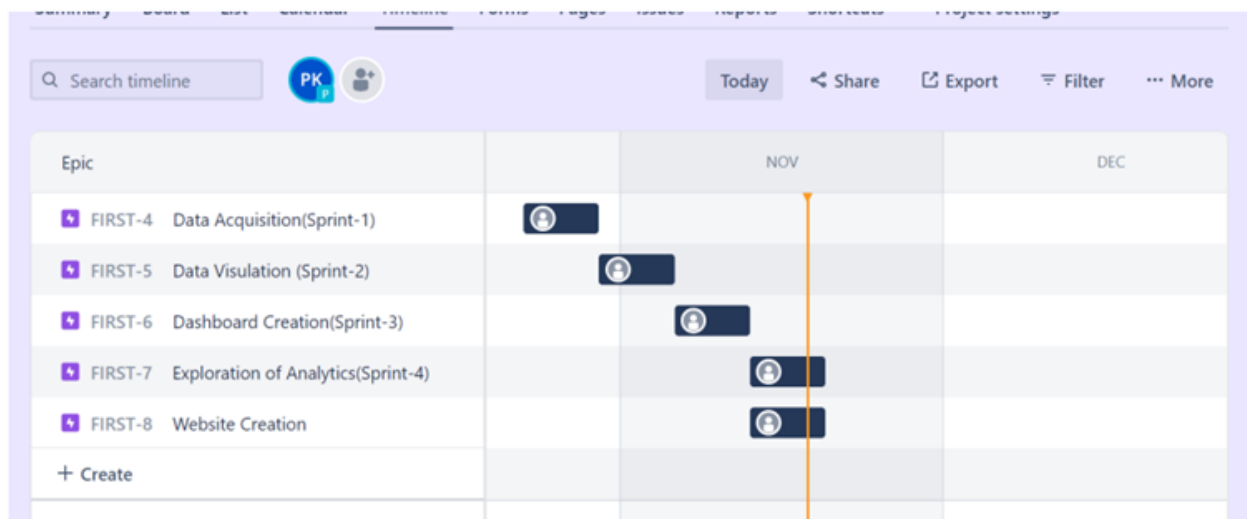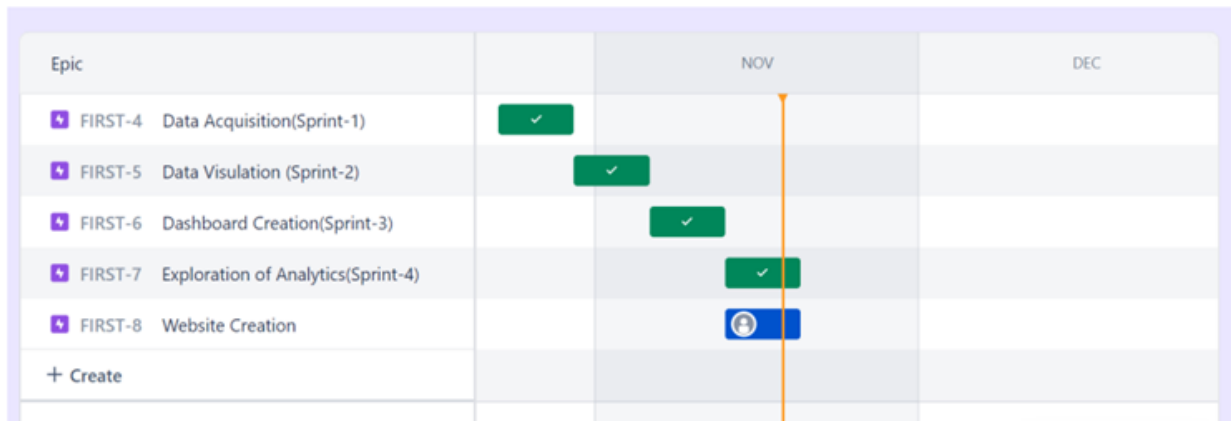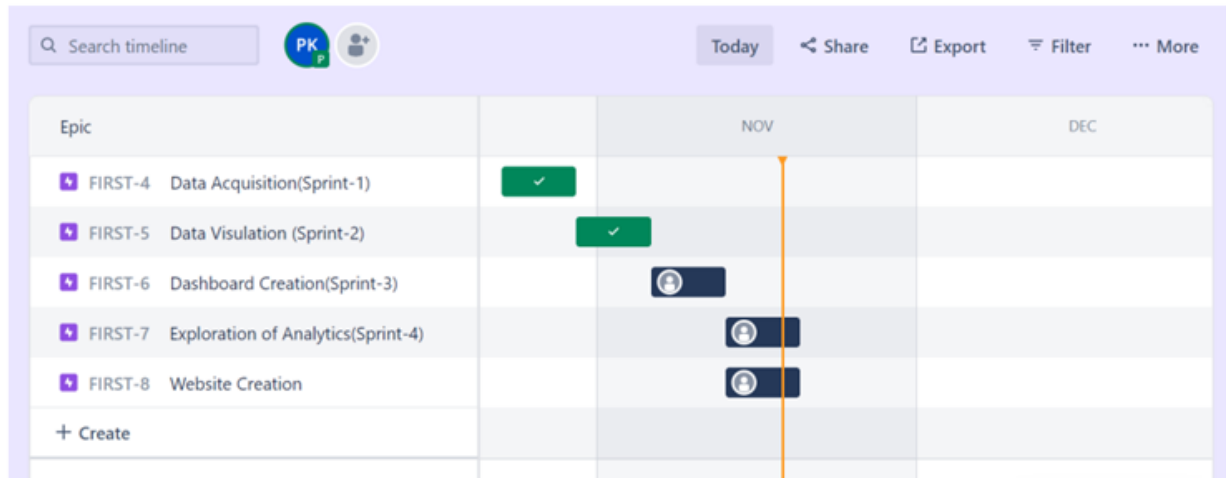
7. CODING & SOLUTIONING

Visualization using Python Code:

```
#importing libraries
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
# loading the Data set
df=pd.read_csv("Global_Superstore2.csv")
df.head()
#Changing the Date type to date and time
df["Order Date"]=pd.to_datetime(df["Order Date"])
df["Ship Date"]=pd.to_datetime(df["Ship Date"])
df.info()
#Finding thne unique values
df.nunique()
#Removing the leading Spaces for object type data
def remove_leading_spaces(data):
    for cols in data.columns:
        if data[cols].dtypes in ['object']:
            data[cols] = data[cols].str.strip()
        return data
df = remove_leading_spaces(df)
df.head()
df['Ship Mode'] = df['Ship Mode'].astype('category')
df['Segment'] = df['Segment'].astype('category')
df['Country'] = df['Country'].astype('category')
df['Market'] = df['Market'].astype('category')
df['Region'] = df['Region'].astype('category')
df['Category'] = df['Category'].astype('category')
df['Sub-Category'] = df['Sub-Category'].astype('category')
df['Order Priority'] = df['Order Priority'].astype('category')
#Checking for null values
df.info()
df['Order_year'] = df['Order Date'].dt.year
print('Number of unique customers made purchase in 2011:
{}'.format(df[df['Order_year']==2011]['Customer Name'].nunique()))
print('Number of unique customers made purchase in 2012:
{}'.format(df[df['Order_year']==2012]['Customer Name'].nunique()))
print('Number of unique customers made purchase in 2013:
{}'.format(df[df['Order_year']==2013]['Customer Name'].nunique()))
print('Number of unique customers made purchase in 2014:
{}'.format(df[df['Order_year']==2014]['Customer Name'].nunique()))
def total_purchase_in_year(row):
```

```python
    Order_year = row[24]

    if Order_year in [2011,2012,2013]:
        return 795
    else:
        return 794

df['unique_customers_within_year'] = df.apply(total_purchase_in_year, axis='columns')

#Piechart-Sales by Order Priority
df.groupby(['Order Priority']).sum().plot(kind='pie',y='Sales',autopct='%1.0f%%')

#Piechart-Sales by Market
df.groupby(['Market']).sum().plot(kind='pie',y='Sales',autopct='%1.0f%%')

# Bar chart- Sales by Region
sns.barplot(x='Sales',y='Region',color='Blue',data=df)

# Scatter plot- Sales by Profit with points for Sub-Category
sns.scatterplot(x='Sales',y='Profit',hue='Region',data=df)

#barplot-Sales, Quantity and Profit by Segment
df.groupby(['Segment']).sum().plot(kind='bar',y=['Sales','Quantity','Profit'])

#Pairplot on segmentation
sns.pairplot(df,hue="Segment")
```

8. TESTING

8.1 Test cases

	Date	16/11/2022				
	Team ID	PNT2022TMID53263				
	Project Name	Global Sales Data Analytics				
	Maximum Marks	4 marks				

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
LoginPage_TC_001	Functional	Register Page	Verify user is able to see the Login/Register button to sign up		1.Enter URL and click go 2.Click on the Register here button 3.Verify Signup options for new user displayed 4.Verify Login options for existing	https://global-sales-analytics.s3.amazo3.cloud-object-storage.appdomain.cloud/index.html%3A%3A/Login%20Page.html	Login/Signup options or elements should display	Working as expected	Pass	Login or Signup are displayed.	NO	NO BUG	Pavan Kumar
LoginPage_TC_002	UI	Register Page	Verify the UI elements in Login/Signup		1.Enter URL and click go 2. New customer?Click on the Register here 3.Verify Signup with below UI elements: a.Username text box b.password and Reconfirm Password text box c.Submit and Reset button d.Already a user?Verify Login with below UI elements: 1.Username text box 2.Password text box	https://global-sales-analytics.s3.amazo3.cloud-object-storage.appdomain.cloud/index.html%3A%3A/Login%20Page.html	Application should show below UI elements: a.Username text box b.password text box c.Submit button with Blue colour d.New customer? Create account by clicking on Register here e. password and Confirm password text box.	Working as expected	Pass	All the UI elements added for user login are available.	NO	NO BUG	Kundan Sai chowdary
LoginPage_TC_003	Functional	Login page	Verify user is able to log into application with Valid credentials		1.Enter URL and click go 2.Enter Valid username text box 3.Enter valid password in password text box 5.Click on Submit button	Username: pavan password: pavan3000	User should navigate to user account homepage	Working as expected	Pass	User is able to navigate to home page	NO	NO BUG	Swapna T
LoginPage_TC_004	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL and click go 2.Enter Valid username text box 3.Enter invalid password in password text box 4.Click on Submit button	Username: pavan password: pav1234	Application should Popup 'Incorrect Username or password' validation message.	Working as expected	Pass	Invalid username or password popup is obtained	NO	NO BUG	Bhumireddy Nandini

	Date	16/11/2022				
	Team ID	PNT2022TMID53263				
	Project Name	Global Sales Data Analytics				
	Maximum Marks	4 marks				

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
LoginPage_TC_005	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL and click go 2.Enter invalid username text box 3.Enter valid password in password text box 4.Click on Submit button	Username: pav password: pavan2000	Application should Popup 'Incorrect Username or password' validation message.	Working as expected	Pass	Invalid username or password popup is obtained	No	NO BUG	Pavan Kumar
LoginPage_TC_006	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL and click go 2.Enter invalid username text box 3.Enter invalid password in password text box 4.Click on Submit button	Username: pav password: pava20	Appplication should Popup 'Incorrect Username or password' validation message.	Working as expected	Pass	Invalid username or password popup is obtained	NO	NO BUG	Kundan Sai chowdary
HomePage_TC_001	Functional	Home Page	Verify user is directed to the Home page after loging.		Check whether the Home page has Technical Architecture and Navigation Bar		User should navigate to user account homepage	Working as expected	Pass	User is navigated to home page	NO	NO BUG	Swapna T
HomePage_TC_002	Functional	Home page	Verify user is able to Navigate to different		Check whether the user is able to Navigate using navigation bar		User should navigate to different pages using navigation bar	Working as expected	Pass	User was able to navigate to different pages	NO	NO BUG	Bhumireddy Nandini
DashboardPage_TC_001	Functional	Dashboard page	Verify user is able to explore the different Dashboard for production.		1.Click on the Dashboard button in navigation bar. 2.After clicking the Dashboard option you will get page with different dashboards. 3.Choose any one of the dashboard and explore them.		User able to see different dashboards and use them.	Working as expected	Pass	User was able to view different dashboards and analyse them.	NO	NO BUG	Pavan Kumar

	Date	16/11/2022				
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Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
DashboardPage_TC_001	Functional	Dashboard page	Verify user is able to explore the different Dashboard for production.		1.Click on the Dashboard button in navigation bar. 2.After clicking the Dashboard option you will get page with different dashboards. 3.Choose any one of the dashboard and explore them.		User able to see different dashboards and use them.	Working as expected	Pass	User was able to view different dashboards and analyse them.	NO	NO BUG	Pavan Kumar
ReportPage_TC_001	Functional	Report page	Verify user is able to explore the Report Page.		1.Click on the report button in navigation bar. 2.After clicking the Report option you will get page with different Report cards.		User is able to navigate to Report page and view the report page	Working as expected	Pass	User was able to view different report pages and analyse them.	No	NO BUG	Swapna T
StoryPage_TC_001	Functional	Story page	Verify user is able to explore the Story Page.		1.Click on the story button in navigation bar. 2. After clicking the story button you will get page with different story.		User is able to navigate to Story page and view the Story page	Working as expected	Pass	User was able to view different slides in a story and analyse them.	NO	NO BUG	Kundan Sai chowdary
ContactUsPage_TC_001	Functional	Contact Us page	Verify user is able to contact with contributors.		1.Click on the Contact us button in navigation bar. 2.After clicking the contact button you will get the contact details of contributors and you can directly contact with them.		User is able to navigate to Contact us page and view the details of contributors.	Working as expected	Pass	User was able to navigate to Contactus page to contact the team.	NO	NO BUG	Bhumireddy Nandini
LogoutPage_TC_001	Functional	Logout Option	Verify user is able to logout from the web page		1.Click on the logout button in navigation bar. 2.After clicking the logout button you will directed to the login page		User is able to navigate to login page after clicking the logout option.	Working as expected	Pass	User was able to logout from the page	NO	NO BUG	Pavan Kumar

8.2 User Acceptance Testing

Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issuesof the **Global Sales Data Analytics** project at the time of the release to User Acceptance Testing (UAT).

Defect Analysis

This report showsthe number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	8	4	2	3	17
Duplicate	0	1	2	0	3
External	2	1	0	1	4
Fixed	13	4	3	20	40
Not Reproduced	0	0	1	0	1
Skipped	0	1	0	1	2
Won't Fix	0	3	0	1	4
Totals	23	14	8	26	71

Test Case Analysis

This report shows the numberof test cases that have passed, failed,and untested

Section	Total Cases	Not Tested	Fail	Pass

Print Engine	5	0	0	5
Client Application	18	0	0	18
Security	4	0	0	4
Outsource Shipping	7	0	0	7
Exception Reporting	8	0	0	8
Final ReportOutput	4	0	0	4
Version Control	4	0	0	4

9. RESULTS

Segment-wise sales, profit, and quantity
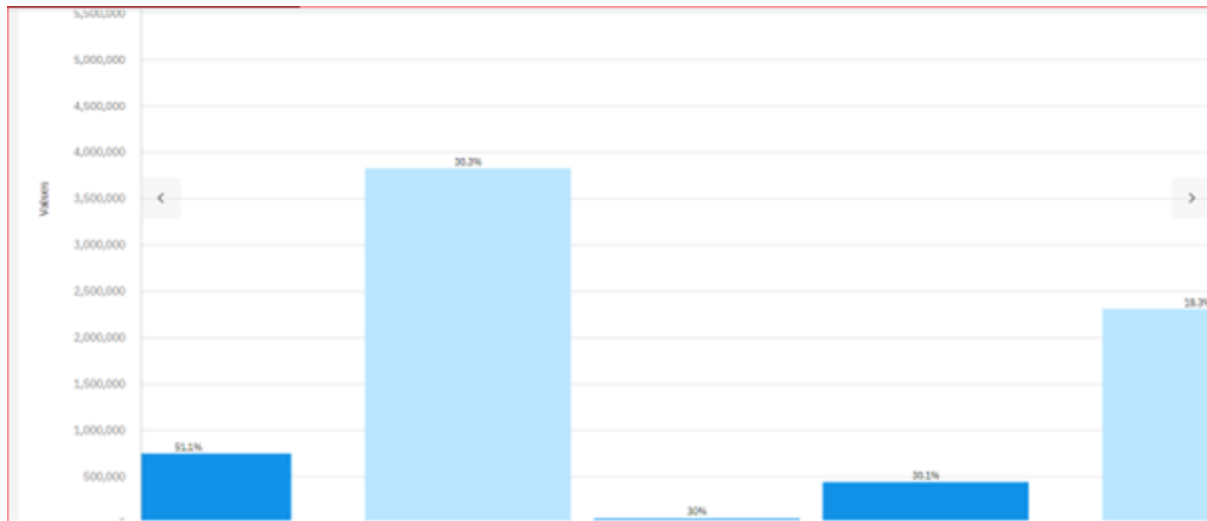
Sales Dashboard

Global Sales Analytics

Sales By Region

Sales
Region
● Africa ● South ● Central ● Southeast Asia ● Caribbean ● North ● EMEA ● North Asia
● East ● Oceania ● Central Asia ● West ● Canada

Sales By Segment

Segment
● Corporate ● Consumer ● Home Office

12,642,501.909880029
Sales

Sub-Category
● Tables ● Furnishings ● Envelopes ● Fasteners ● Copiers ● Art ● Paper ● Chairs ● Supplies ⊕ Appliances ● Bookcases
● Labels ● Accessories ● Phones ● Binders ● Machines ● Storage
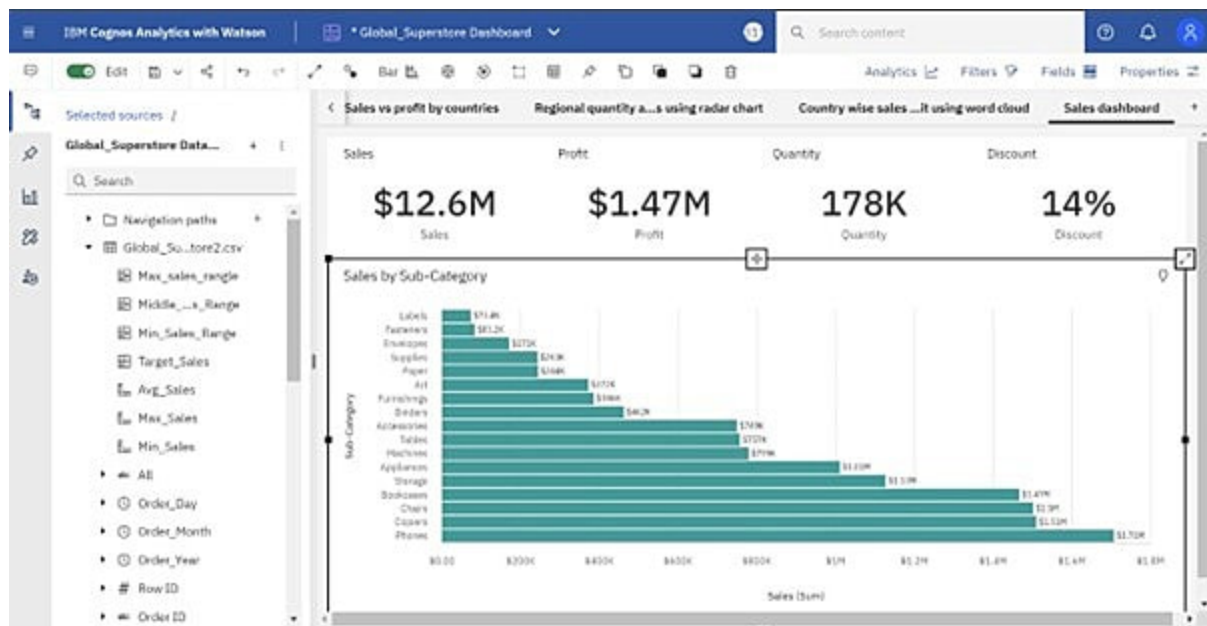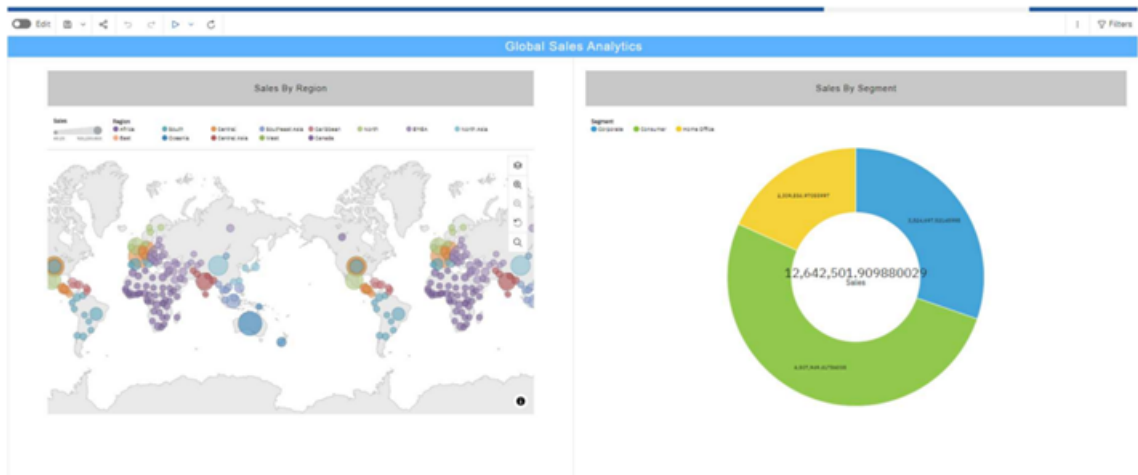
Story-Board

Some Python Plots
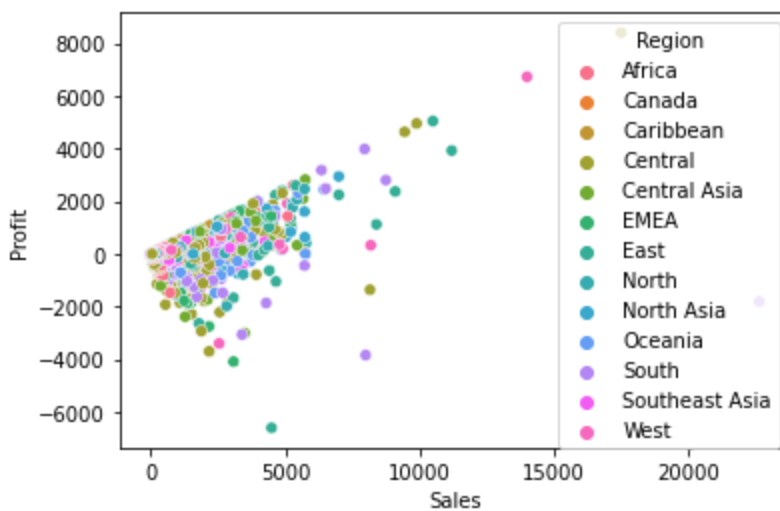
10. ADVANTAGES & DISADVANTAGES

Advantages:

- Visualisation with Cognos is efficient and easy

- Ability to use a variety of charts-crosstabs, bar or 3D bar, pie or doughnut, line, gauge, funnel, scatter, dot density, waterfall, and so forth.

- High-performance data access across all sources.

- Adaptive authoring automatically adjusts the report layout when objects are added, moved, or removed.

- Lower costs-reduces maintenance due to complete report coverage and a zero-footprint environment.

- Faster results-shortens reporting time due to seamless integration and adaptive authoring.

- Using Matplotlib & Seaborn for visualisation in python was helpful and useful.

Disadvantages:

- Python cannot be used for all the visualisations.

- The given data set is not up to date.

- Not everyone is able to use this technology.

11. Conclusion

This project, "Global Sales Data Analytics", has helped to visualize the Sales using the attributes such as Sub-Category, Markets, Regions, and Profit. The Dashboard is built using IBM Cognos Watson. Technology has helped largely in the marketing field. Successful analysis has been performed on the Global Sales data based on Market, geographic location, and area coverage. Also, the major trends have been identified.

12. FUTURE SCOPE

A lot of steps were involved in the data visualization and creation of the dashboard. It would be much more convenient and efficient to identify the target attribute only, hence reducing the computational work. There should also be a proper algorithm selection process.

13. APPENDIX

Source Code

Website Code

Login-page.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" />
    <link rel="preconnect" href="https://fonts.googleapis.com" />
    <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin />
    <link
      href="https://fonts.googleapis.com/css2?family=Open+Sans:wght@300;600&display=swap"
      rel="stylesheet"
    />
    <title>LOGIN SYSYEM</title>
    <style>
      * {
        font-family: "Open Sans", sans-serif;
      }
      .container_login {
        background-color: #f5f5f5;
        display: flex;
        justify-content: center;
        align-items: center;
        height: 100vh;
        width: 100vw;
      }
      div {
        margin-bottom: 10px;
      }
      input {
        padding: 10px 15px;
        border: 1px solid dodgerblue;
```

```css
      border-radius: 5px;
      width: 200px;
      outline: 0px;
    }
    input:focus {
      border: 2px solid darkblue;
    }
    button {
      background-color: blue;
      font-size: larger;
      width: fit-content;
      border-radius: 5px;
      padding: 5px 8px;
      color: white;
      margin: 0px 10px 10px 0px;
      border: 0;
    }
    button:hover {
      background-color: dodgerblue;
    }
    #CB {
      width: auto;
    }
    p {
      margin: 0px;
    }
    a {
      text-decoration: none;
    }
    #fp {
      margin-left: 30px;
    }
    a:hover {
      color: dodgerblue;
      text-decoration: none;
    }
    #b {
      color: white;
    }
  </style>
</head>
<body>
  <article class="container_login">
    <form>
      <h2>Please sign in</h2>
      <div>
        <input
```

```
          type="text"
          placeholder="Email address"
          id="username"
          required
        />
      </div>
      <div>
        <input
          type="password"
          placeholder="Password"
          id="password"
          required
        />
      </div>
      <div><input id="CB" type="checkbox" /> Remember Me</div>
      <button type="button" onclick="login()" class="btn btn-primary">Submit</button>
      <!-- <button type="submit">
        <script src="javascript.js"></script>
        <a id="b" href="index.html">submit</a>
      </button> -->
      <!-- <a id="fp" href="https://www.google.com/" target="_blank"
        >Forgot Password ?</a> -->
      <p>
        New Users,
        <a href="registration.html" target="_blank">Register here!!</a>
      </p>
      <script src="javascript.js"></script>
    </form>
   </article>
 </body>
</html>
```

Registration.html:
```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Registration</title>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css" rel="stylesheet">
  <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.bundle.min.js"></script>
  <style>
   body{
    background-size: cover;
   }
   h2{
      font-size:40px;
```

```
      color: rgb(8, 94, 215);
   }
   div.mt-3{
      color: rgb(8, 94, 215);
      font-size:20px;
   }
   p{
      font-size:25px;
      color: rgb(8, 94, 215);
   }
 </style>
</head>
<body background="1.jpg">
<br><br>
   <h2><center>REGISTRATION</h2>

      <form>
         <div class="d-flex align-items-center justify-content-center">
            <div class="mb-3 mt-3 p-5 text-dark" >
               <div class="p-5">
                  <div class='mt-3'>
                     <label for="username" class="form-label">Username</label>
                     <input type="text" class="form-control" id="username" placeholder="Enter your
username" maxlength="20" minlength="3" required>
                  </div>
                  <div class="mt-3" >
                     <label for="password" class="form-label" required>Password</label>
                     <input type="password" class="form-control" id="password" placeholder="Enter your
password" maxlength="15">
                  </div>
                  <div class="mt-3" >
                     <label for="password1" class="form-label" required>Reconfirm Password</label>
                     <input type="password" class="form-control" id="password1" placeholder="Enter your
password">
                  </div>
                  <div>
                     <br>
                     <button type="button" onclick="register()" class="btn btn-primary">Submit</button>
                     <input type="reset" class="btn btn-primary">
                  </div>
                  <br>
                  <p>Already an user?<a href="login Page.html">Login</a></p>
               </div>
            </div>
         </div>
      </form>
   </div>
```

```html
    </div>
    <script src="javascript.js"></script>
</body>
</html>
```

Javascript.js:

```javascript
var data = [
    {
        username:"Kundan",
        password:"jash2002"
    },
    {
        username:"swapna",
        password:"sahan2001"
    },
    {
        username:"nandini",
        password:"nandu"
    },
    {
        username:"pavan",
        password:"pavan2000"
    },
    {
        username:"Arul",
        password:"Admin123"
    }
]
function login(){
    var uname = document.getElementById("username").value
    var pass = document.getElementById("password").value

    for (i = 0; i<data.length; i++){
        if (uname == data[i].username && pass == data[i].password){
            window.location.replace("index.html")
            return false
        }
    }
    alert("Incorrect password")
}
function register(){
    var runame = document.getElementById("username").value
    var rpass = document.getElementById("password").value
    var rpass1 = document.getElementById("password1").value
    if (rpass == rpass1){
```

```
        var rdata = {
            username: runame,
            password: rpass
        }
    }else{
        alert("password doesn't match")
        return
    }

    for (i = 0; i<data.length; i++){
        if (runame == data[i].username){
            alert("Username not available")
            return false
        }
    }
    data.push(rdata)
    window.location.replace("Dashboard.html")
}
```

Index.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>Index</title>
    <style>
     .container {
       height: 50px;
       font-family: Arial, Helvetica, sans-serif;
       background-color: rgb(8, 94, 215);
       display: flex;
       flex-direction: row;
       justify-content: flex-end;
       align-items: center;
     }
     a {
       color: whitesmoke;
       text-decoration: none;
     }
     a:hover {
       color: navy;
       text-decoration: none;
     }
```

```css
.nav_items {
  color: whitesmoke;
  padding: 0px;
  font-size: larger;
  margin: 0px 40px 0px 40px;
}
input,
textarea {
  padding: 10px 15px;
  margin-top: 5px;
  margin-bottom: 10px;
  border: 1px solid navy;
  border-radius: 5px;
  width: 500px;
  outline: 0px;
}
input:focus,
textarea:focus {
  border: 2px solid navy;
}
ul {
  padding-left: 0px;
}
.contactGrid {
  display: grid;
  grid-template-rows: repeat(2, 170px);
  grid-template-columns: repeat(2, 300px);
}
.contactBox {
  background-color: dodgerblue;
  color: white;
  border: 2px solid white;
  padding: 20px;
  display: flex;
  flex-direction: column;
  justify-content: center;
  align-items: center;
}
h4 {
  margin: 0px;
}
.contactInfo,
.lastPart {
  display: flex;
  justify-content: space-around;
  align-items: center;
  margin-bottom: 40px;
```

```css
    }
    .icons {
      width: 30px;
      height: 30px;
      margin-right: 10px;
    }
    .contactBox:hover {
      background-color: dodgerblue;
    }
    button {
      background-color: tomato;
      font-size: larger;
      border-radius: 5px;
      width: 150px;
      height: auto;
      padding: 10px;
      color: white;
      margin: 0px 10px 10px 0px;
      border: 0;
    }
    button:hover {
      background-color: dodgerblue;
    }
    .matter {
      color: #1b0760;
      font-weight: bold;
      text-align: center;
      font-size: large;
    }
    img {
      margin: 50px;
      height: 250px;
      width: 1000px;
      border-radius: 5px;
    }
  </style>
</head>
<body>
  <nav>
    <article class="container">
    <ul>
      <a class="nav_items" href="index.html">Home</a>
    </ul>
    <ul>
      <a class="nav_items" href="dashboard.html">Dashboard</a>
    </ul>
    <ul>
```

```
      <a class="nav_items" href="report.html">Report</a>
    </ul>
    <ul>
      <a class="nav_items" href="story.html">Story</a>
    </ul>
    <ul>
      <a class="nav_items" href="contactUs.html">Contact Us</a>
    </ul>
    <ul>
      <a class="nav_items" href="login Page.html">Log out</a>
    </ul>
  </article>
</nav>

<!-- BODY -->
<article style="text-align: center">
  <h1>Global Sales Data Analytics</h1>

  <p class="matter">
    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.
  </p>

  <h2>Technical Architecture :</h2>
  <img src="ICONS/ibm_image.png" alt="Architecture" />
</article>
</body>
</html>
```

Dashboard.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>Dashboard</title>
    <style>
      .container {
        height: 50px;
        font-family: Arial, Helvetica, sans-serif;
        background-color: rgb(8, 94, 215);
        display: flex;
```

```css
      flex-direction: row;
      justify-content: flex-end;
      align-items: center;
    }
    a {
      color: whitesmoke;
      text-decoration: none;
    }
    a:hover {
      color: black;
      text-decoration: none;
    }
    .nav_items {
      color: whitesmoke;
      padding: 0px;
      font-size: larger;
      margin: 0px 40px 0px 40px;
    }

    ul {
      padding-left: 0px;
    }

    h4 {
      margin: 0px;
    }
  </style>
</head>
<body>
  <nav>
    <article class="container">
      <ul>
        <a class="nav_items" href="index.html">Home</a>
      </ul>
      <ul>
        <a class="nav_items" href="dashboard.html">Dashboard</a>
      </ul>
      <ul>
        <a class="nav_items" href="report.html">Report</a>
      </ul>
      <ul>
        <a class="nav_items" href="story.html">Story</a>
      </ul>
      <ul>
        <a class="nav_items" href="contactUs.html">Contact Us</a>
      </ul>
      <ul>
```

```html
      <a class="nav_items" href="login Page.html">Log out</a>
    </ul>
   </article>
  </nav>
  <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRef=.my_folders%2FGlobal
_Superstore%2BDashboard&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar
=false&amp;shareMode=embedded&amp;action=view&amp;mode=dashboard&amp;subView=model00
00018460f52dcd_00000000"
   width="1250"
   height="500"
   frameborder="0"
   gesture="media"
   allow="encrypted-media"
   allowfullscreen="">
  </iframe>
   <!-- <iframe

src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FGlobal_Superstore%2BReport&amp;
closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedd
ed&amp;action=edit"
     width="1000"
     height="1000"
     frameborder="0"
     gesture="media"
     allow="encrypted-media"
     allowfullscreen=""
   ></iframe> -->
  </body>
</html>
```

Report.html:

```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</title>
  <style>
   .container {
     height: 50px;
     font-family: Arial, Helvetica, sans-serif;
     background-color: rgb(8, 94, 215);
     display: flex;
     flex-direction: row;
     justify-content: flex-end;
```

```html
      align-items: center;
    }
    a {
      color: whitesmoke;
      text-decoration: none;
    }
    a:hover {
      color: black;
      text-decoration: none;
    }
    .nav_items {
      color: whitesmoke;
      padding: 0px;
      font-size: larger;
      margin: 0px 40px 0px 40px;
    }

    ul {
      padding-left: 0px;
    }

    h4 {
      margin: 0px;
    }
  </style>
</head>
<body>
  <nav>
    <article class="container">
      <ul>
        <a class="nav_items" href="index.html">Home</a>
      </ul>
      <ul>
        <a class="nav_items" href="dashboard.html">Dashboard</a>
      </ul>
      <ul>
        <a class="nav_items" href="report.html">Report</a>
      </ul>
      <ul>
        <a class="nav_items" href="story.html">Story</a>
      </ul>
      <ul>
        <a class="nav_items" href="contactUs.html">Contact Us</a>
      </ul>
      <ul>
        <a class="nav_items" href="login Page.html">Log out</a>
      </ul>
```

```
    </article>
  </nav>

  <iframe
src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FGlobal%2BSales_report&amp;close
WindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&a
mp;action=run&amp;format=HTML&amp;prompt=false"
    width="1250"
    height="500"
    frameborder="0"
    gesture="media"
    allow="encrypted-media"
    allowfullscreen="">
  </iframe>
  </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</title>
    <style>
      .container {
        height: 50px;
        font-family: Arial, Helvetica, sans-serif;
        background-color: rgb(8, 94, 215);
        display: flex;
        flex-direction: row;
        justify-content: flex-end;
        align-items: center;
      }
      a {
        color: whitesmoke;
        text-decoration: none;
      }
      a:hover {
        color: black;
        text-decoration: none;
      }
      .nav_items {
        color: whitesmoke;
        padding: 0px;
        font-size: larger;
```

```html
      margin: 0px 40px 0px 40px;
    }

    ul {
      padding-left: 0px;
    }

    h4 {
      margin: 0px;
    }
  </style>
</head>
<body>
  <nav>
    <article class="container">
      <ul>
        <a class="nav_items" href="index.html">Home</a>
      </ul>
      <ul>
        <a class="nav_items" href="dashboard.html">Dashboard</a>
      </ul>
      <ul>
        <a class="nav_items" href="report.html">Report</a>
      </ul>
      <ul>
        <a class="nav_items" href="story.html">Story</a>
      </ul>
      <ul>
        <a class="nav_items" href="contactUs.html">Contact Us</a>
      </ul>
      <ul>
        <a class="nav_items" href="login Page.html">Log out</a>
      </ul>
    </article>
  </nav>
  <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&amp;pathRef=.my_folders%2FGlobal_Superstore%2Bstory&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;sceneId=model000001847232d49e_00000002&amp;sceneTime=5000"
    width="1250"
    height="500"
    frameborder="0"
    gesture="media"
    allow="encrypted-media"
    allowfullscreen="">
  </iframe>
```

```
  </body>
</html>
```

Contact us.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>Contact Us</title>
    <style>
      .container {
        height: 50px;
        font-family: Arial, Helvetica, sans-serif;
        background-color: rgb(8, 94, 215);
        display: flex;
        flex-direction: row;
        justify-content: flex-end;
        align-items: center;
      }
      a {
        color: whitesmoke;
        text-decoration: none;
      }
      a:hover {
        color: dodgerblue;
        text-decoration: none;
      }
      .nav_items {
        color: whitesmoke;
        padding: 0px;
        font-size: larger;
        margin: 0px 40px 0px 40px;
      }
      input,
      textarea {
        padding: 10px 15px;
        margin-top: 5px;
        margin-bottom: 10px;
        border: 1px solid navy;
        border-radius: 5px;
        width: 500px;
        outline: 0px;
      }
      input:focus,
      textarea:focus {
```

```css
  border: 2px solid navy;
}
ul {
  padding-left: 0px;
}
.contactGrid {
  display: grid;
  grid-template-rows: repeat(2, 170px);
  grid-template-columns: repeat(2, 300px);
}
.contactBox {
  background-color: dodgerblue;
  color: white;
  border: 2px solid white;
  padding: 20px;
  display: flex;
  flex-direction: column;
  justify-content: center;
  align-items: center;
}
h4 {
  margin: 0px;
}
.contactInfo,
.lastPart {
  display: flex;
  justify-content: space-around;
  align-items: center;
  margin-bottom: 40px;
}
.icons {
  width: 30px;
  height: 30px;
  margin-right: 10px;
}
.contactBox:hover {
  background-color: royalblue;
}

button {
  background-color: tomato;
  font-size: larger;
  border-radius: 5px;
  width: 150px;
  height: auto;
  padding: 10px;
  color: white;
```

```
      margin: 0px 10px 10px 0px;
      border: 0;
    }
    button:hover {
      background-color: dodgerblue;
    }
    .management {
      display: flex;
      flex-direction: column;
      flex-wrap: wrap;
      justify-content: center;
    }
    .memImg {
      width: 300px;
      height: 300px;
      margin: 20px;
      object-fit: cover;
      border-radius: 150px;
    }
    .NameTag {
      text-align: center;
      color: #1b0760;
      font-size: large;
    }
  </style>
</head>
<body>
 <nav>
   <article class="container">
    <ul>
     <a class="nav_items" href="index.html">Home</a>
    </ul>
    <ul>
     <a class="nav_items" href="dashboard.html">Dashboard</a>
    </ul>
    <ul>
     <a class="nav_items" href="report.html">Report</a>
    </ul>
    <ul>
     <a class="nav_items" href="story.html">Story</a>
    </ul>
    <ul>
     <a class="nav_items" href="contactUs.html">Contact Us</a>
    </ul>
    <ul>
     <a class="nav_items" href="login Page.html">Log out</a>
    </ul>
```

```html
      </article>
    </nav>
    <article>
      <div>
        <h2 style="text-align: center">Subscribe to receive updates!</h2>
        <div style="text-align: center">
          <form>
            <input
              id="inputEmail"
              type="email"
              placeholder="Enter email address..."
            />
            <button type="submit">Subscribe</button>
          </form>
        </div>
      </div>
    </article>

    <h1 style="text-align: center; color: #1b0760">OUR MANAGEMENT</h1>
    <div class="management">
      <div>
        <article class="NameTag">
          Mr Sannapaneni Kundan Sai Chowdary - Team Leader
        </article>
      </div>
      <div>
        <article class="NameTag">Miss Swapna T - Scrum Team</article>
      </div>
      <div>
        <article class="NameTag">Miss Bhumireddy Nandini - Scrum Team</article>
      </div>
      <div>
        <article class="NameTag">Mr Pavan Kumar Malasani - Scrum Team</article>
      </div>
    </div>
    <h2 style="text-align: center">CONTACT US</h2>

    <section class="contactInfo">
      <section class="box-1">
        <article class="contactGrid">
          <div class="contactBox">
            <img src="ICONS/address.png" alt="Address" />
            <h4>Address</h4>
            <p>SSN College of Engineering, Kalavakkam, Tamil Nadu – 603 110</p>
          </div>
          <div class="contactBox">
            <img
```

```html
      style="margin-bottom: 10px"
      src="ICONS/call us.png"
      alt="Call us"
    />
    <h4>Call Us</h4>
    <p>+91 44 2746 9700</p>
  </div>
  <div class="contactBox">
    <img src="ICONS/email.png" alt="Email" />
    <h4>Email Us</h4>
    <p>info@ssn.edu.in</p>
  </div>
  <div class="contactBox">
    <img src="ICONS/working hours.png" alt="Working Hours" />
    <h4>Working Hours</h4>
    <p>Mon - Fri: 9AM to 9PM</p>
  </div>
 </article>
</section>
<section class="box-2">
  <form action="" method="POST">
    <div class="form-group">
     <input
       class="FormInput"
       placeholder="Your Name"
       type="text"
       name="name"
     />
    </div>
    <div class="form-group">
     <input
       class="FormInput"
       placeholder="Your Email"
       type="email"
       name="email"
     />
    </div>
    <div class="form-group">
     <input
       class="FormInput"
       placeholder="Subject"
       type="text"
       name="subject"
     />
    </div>
    <div class="form-group">
     <textarea
```

```html
        class="FormInput"
        placeholder="Message"
        class="form-control"
        name="message"
        rows="5"
      ></textarea>
      <div class="validate"></div>
    </div>
    <div class="center">
      <button type="submit">Send Message</button>
    </div>
  </form>
</section>
</section>
<article class="lastPart">
  <div class="copyright">
    &copy; Copyright
    <strong><span>Global Sales Data Analytics</span></strong
    >. All Rights Reserved
  </div>
  <div class="socialIcons">
    <a href="" target="_blank"
      ><img class="icons" src="ICONS/facebook.png" alt=""
    /></a>
    <a href="" target="_blank"
      ><img class="icons" src="ICONS/twitter.png" alt=""
    /></a>
    <a href="" target="_blank"
      ><img class="icons" src="ICONS/instagram.png" alt=""
    /></a>
    <a href="" target="_blank"
      ><img class="icons" src="ICONS/linkedin.png" alt=""
    /></a>
    <a href="" target="_blank"
      ><img class="icons" src="ICONS/youtube.png" alt=""
    /></a>
  </div>
</article>
</body>
</html>
```

GitHub & Project Demo Link

GitHub Link:

[IBM-EPBL/IBM-Project-20003-1659710734: Global Sales Data Analytics (github.com)](#)

Demo Link:

[https://youtu.be/wi_rz30btfM](#)