GLOBAL SALES DATA ANALYTICS

A PROJECT REPORT

Submitted by

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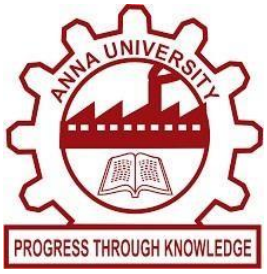
degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY



NALAIYATHIRAN (IBM) PROJECT
ANNA UNIVERSITY: CHENNAI 600 025
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1.INTRODUCTION

1.1 PROJECT OVERVIEW

Shopping online is currently the need of the hour. Because of this COVID, it's not easy to walk into 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 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 PROBLEMS

• The huge blast of information and Internet gadgets has prompted a fast approach to Big Data in the later past. The administration industry which is a noteworthy client for these Big Data applications will prompt real change to the conveyance process and new bits of knowledge into utilization examples and work processes,

which thusly will help with new worldwide conveyance models incorporating new innovations and dispersion of work comprehensively. The Service Industry will utilize Big Data for different choices making an information framework and making the work process more ideal. The idea of large-scale manufacturing lead to the Industrial Revolution, likewise, Big Data is relied upon to drive new types of financial movement in the Service industry with connected human capital, achieving a new level of monetary action, development, and development.

• In the information era, enormous amounts of data have become available on hand to decision-makers. Big data refers to datasets that are not only big but also high in variety and velocity, which makes them difficult to handle using traditional tools and techniques. Due to the rapid growth of such data, solutions need to be studied and provided in order to handle and extract value and knowledge from these datasets. Furthermore, decision-makers need to be able to gain valuable insights from such varied and rapidly changing data, ranging from daily transactions to customer interactions and social network data. Such value can be provided using big data analytics, which is the application of advanced analytics techniques on big data. This paper aims to analyze some of the different analytics methods and tools which can be applied to big data, as well as the opportunities provided by the application of big data analytics in various decision domains

. • In the modern era of higher education, it is exceptionally challenging for teachers to counsel students in terms of academic matters. Teachers have abundant data related to different aspects of students but deriving appropriate insights from them is very challenging. Predictive analytics plays an important role to cope with such challenges. However, for effective predictive analytics, numerous factors must be considered such as the selection of proper academic and social variables, the appropriate volume of the data, and quality of the data, and the adoption of suitable predictive algorithms. This paper deals with an exhaustive literature survey of

predictive analytics in the educational domain specifically for higher education. The paper also discussed the analysis of the existing literature survey and identified research gaps.

2.2 REFERENCES

•A literature survey on big data analytics in the service industry.(https://www.researchgate.net/publication/301720427_A_literature_survey_on_Big_Data_Analytics_in_Service_Industry).

•Big Data Analytics: A literature review paper.(https://www.researchgate.net/publication/264555968_Big_Data_Analytics_A_Literature_Review_Paper).

•Iterature survey using predictive analytics for student counselling in higher education.

•(https://www.researchgate.net/publication/355481331_Literature_Survey_using_Predictive_Analytics_for_Student_Counselling_in_Higher_Education).

2.3 PROBLEM STATEMENT DEFINITION

Sales and marketing teams need to review their strategies and performance to make improvements. One way to measure performance is with Sales Analytics. Sales analytics refers to the technology and processes used to gather sales data and gauge sales performance. Sales leaders use these metrics to set goals, improve internal processes, and accurately forecast future sales and revenue. It uses different metrics and KPIs to plan an efficient sales model that generates higher revenue for the business. The goal of sales analytics is always to simplify the information available to the sales and Marketing teams. It should help them clearly understand the team's performance, sales trends, and opportunities to gain many insights and

develop strategies that are better than the previous one.

PS-1:

PS-2:

PS-3:

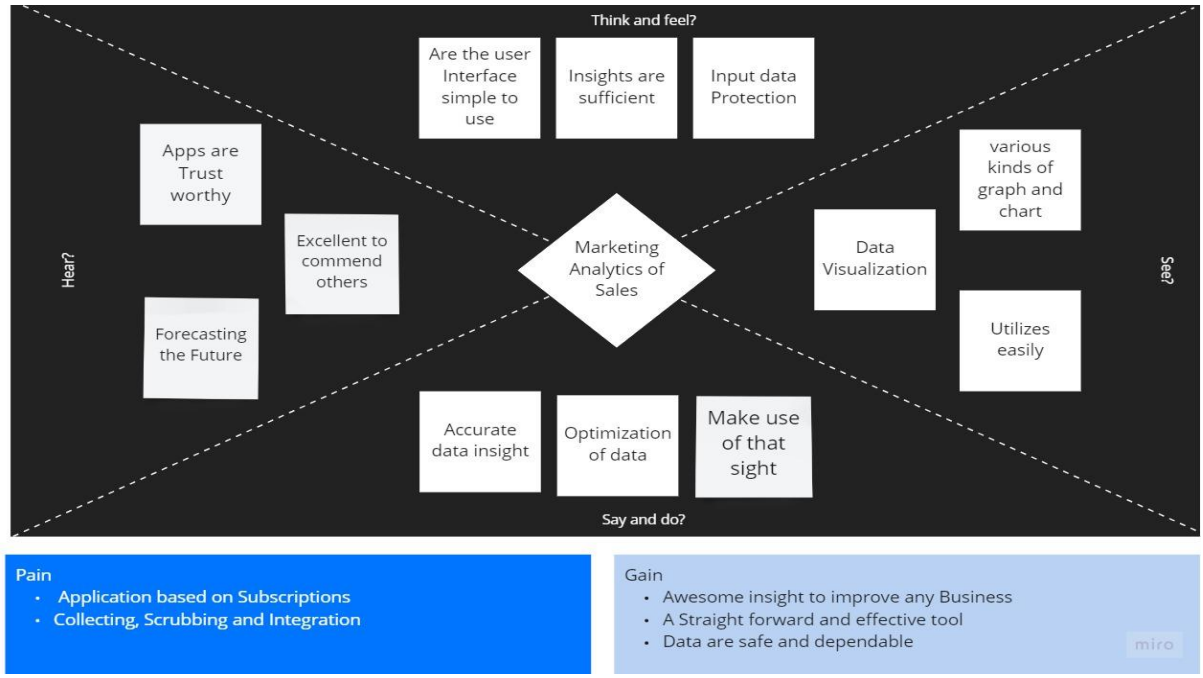
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Sales team Member	Analyze sales across multiple sources	There are inaccuracies in the sales	Sources are different from different systems	Dissatisfied
PS-2	Sales team member	Prepare data	I get errors during data entry	There is complexity in data	Frustrated
PS-3	Sales team member and sales leader of the company	Understand product sales	The Sales strategy is unknown	It is difficult to understand the mindset of a customer	Disappointed

3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

An empathy map is a straightforward, easy-to-understand visual that captures information about a user's behaviours and attitudes. It is a useful tool for assisting teams in better understanding their users. Understanding the true problem and the person experiencing it is necessary for developing an effective solution. The map-making exercise helps participants consider things from the user's point of view, as well as his or her goals and challenges.

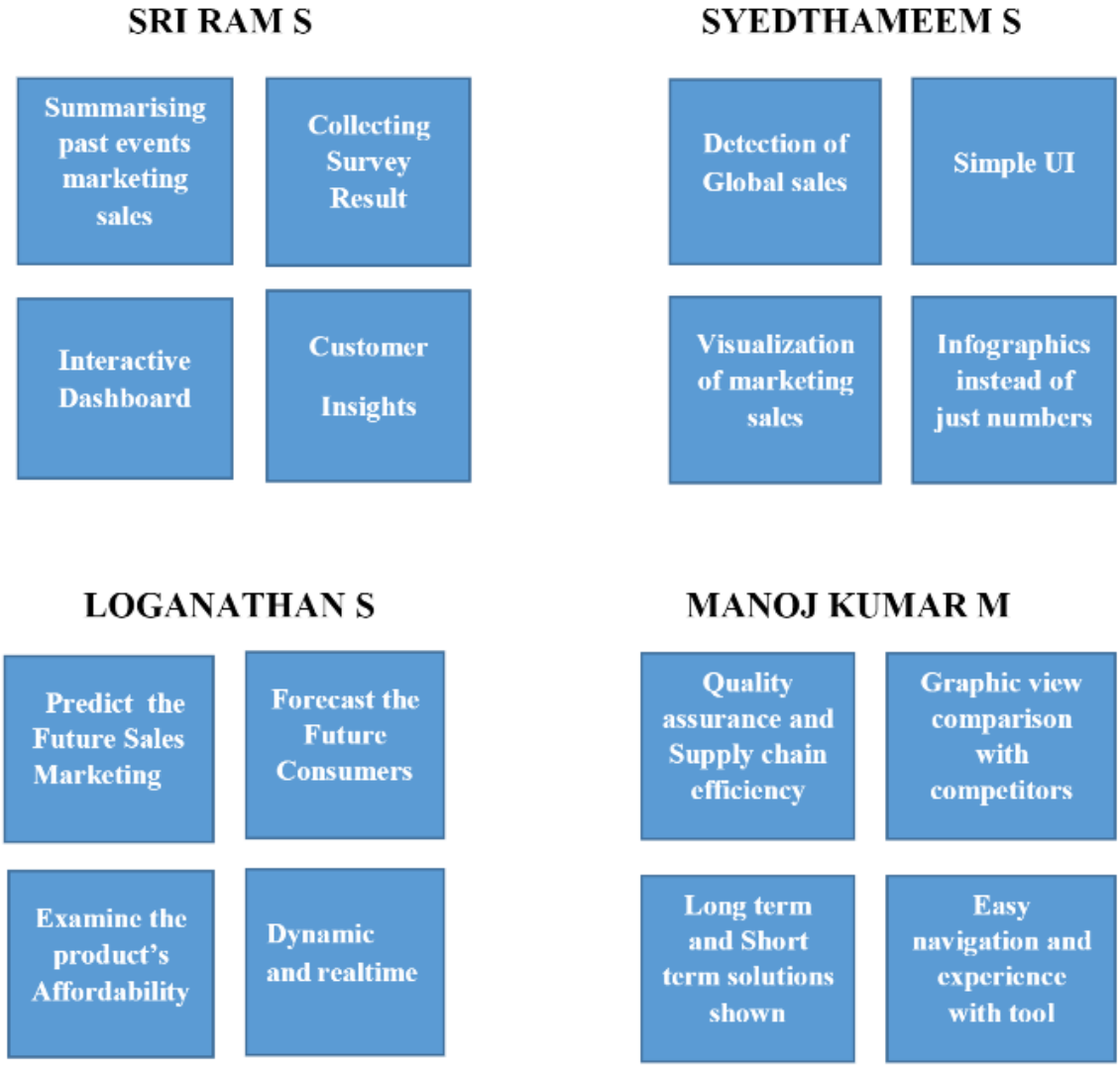
Empathy map for Global Sales Data Analytics



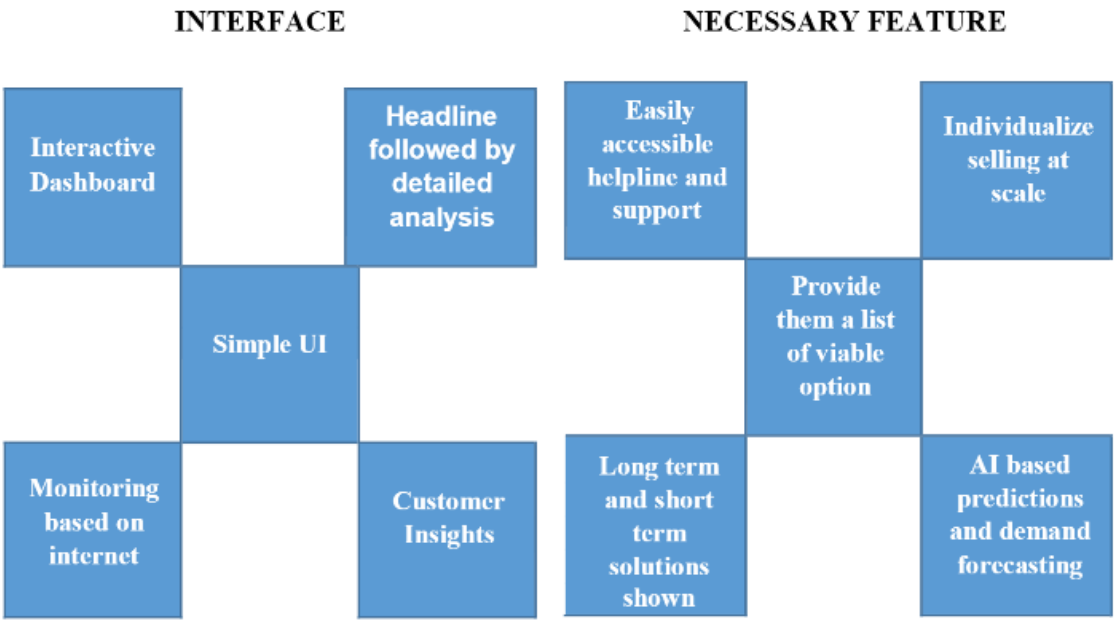
3.2 IDEATION & BRAINSTROMING

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

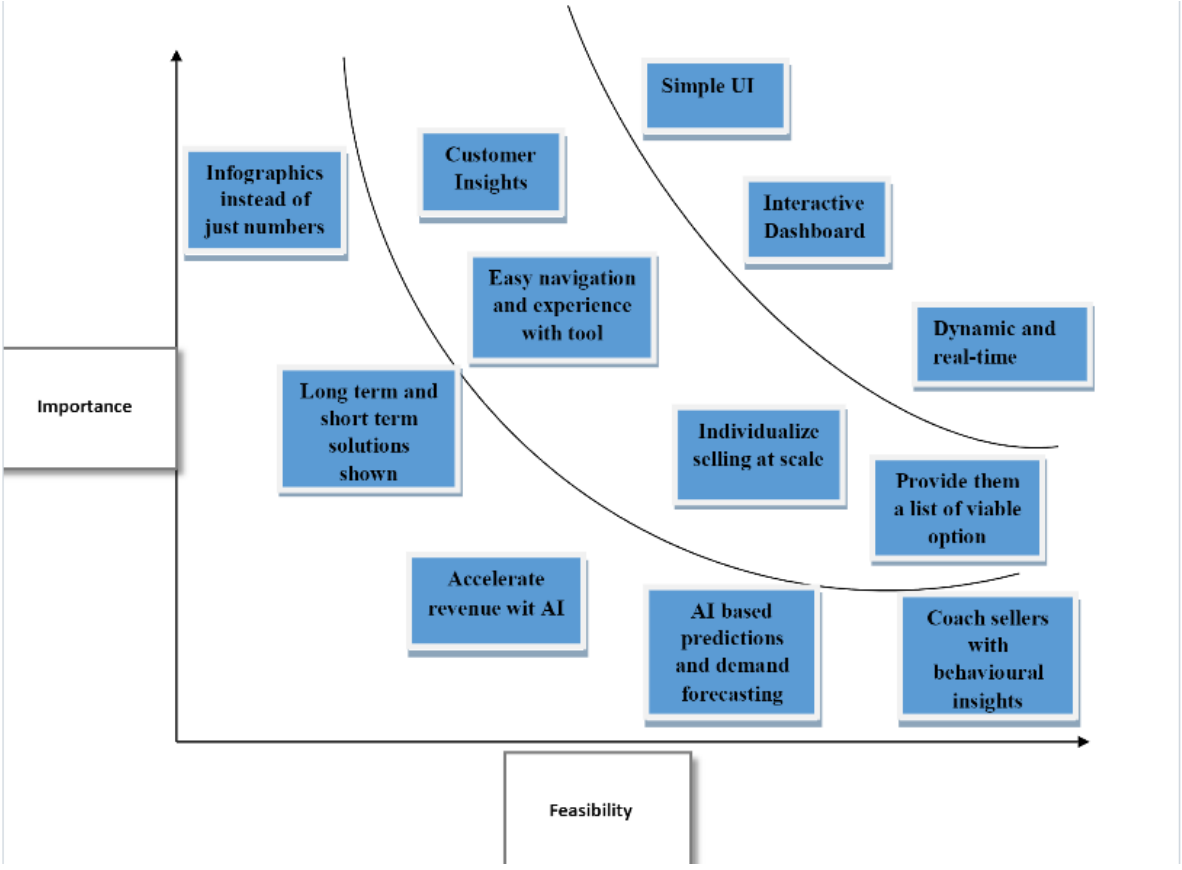
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



3.3 PROPOSED SOLUTION

S .No.	Parameter	Description
1.	**Problem Statement**	The user needs a way to track and maintainoverall sales data so that he can make moreprofit. The user needs a strategy to market the productsso that it reaches all people through media. The user finds the key performance indicators so that he can boost the annual sales and reduces customer churn.
2.	**Solution description**	We can monitor the sales by its geographic location and track order purchases. We can monitor the monthly sales and stocks retained on each product. Create and approve sales orders, track order purchases, improve sales tracking and optimization of goods delivery.
3.	**Uniqueness**	Global Sales Data is properly analyzed to reveal valuable insights and provides solutions for improving sales and achieving target also provides means of optimization of goods delivery.
4.	**Customer Satisfaction**	Ensures sustainability in global market. Creates meaningful change in business approach. Trying to attract customers of all range.

<table>
<tr><td>5.</td><td>Business Model (Revenue Model)</td><td>
<table>
<tr><th>Customer Targets</th><th>Customer Challenges</th><th>Our Solution</th></tr>
<tr><td>To achieve target sales.</td><td>Need strategy to reduce customer churn.</td><td>By monitoring sales distribution and providing offers to achieve target in particular geographic area.</td></tr>
<tr><td>To sustain with the competition in global market.</td><td>To develop unique marketing strategies.</td><td>Advertisin gthrough facebook posts and introduce new innovative products.</td></tr>
</table>
</td></tr>
<tr><td>6.</td><td>Scalability of the Solution</td><td>This analytics provides great results and gives valuable insights even for larger amount of data and supports various fields of data.</td></tr>
</table>

3.4 PROBLEM SOLUTION FIT

1.CUSTOMER SEGMENTS

- E-Commerce Client.
- Proprietor of supermarket
- Owner of a retail establishment.

2.PROBLEMS/PAINS

- To identify the key performance indicators that boots sales.
- To develop strategies for controlling the anxiety caused by the sales market

3.TRIGGER TO ACT

- In order to increase overall sales.
- To remain competitive in the global market.
- To keep track of the financial situation

4.EMOTIONS

- Concerned about the outcome of analytics.
- Depression as a result of high customer churn.

5.PROBLEM ROOT/CAUSE

- Intense competition in the global sales market.
- Sudden drops and increases in the price of essential goods.

6.CUSTOMER LIMITATIONS

- Loss in the last two fiscal quarters.
- Financial situation.
- It is difficult to reach people through traditional media.

7.YOUR SOLUTION

- To compare and visualise sales across different regions.
- To demonstrate the trend in various product sales.
- Promote the product

8.AVAILABLE SOLUTION

- App for tracking sales orders and deliveries.
- To keep an adequate stock of goods on hand.

9.BEHAVIOR

- Considers strategies to boost product sales.
- Considers opportunities to give deals and gift cards.

10.CHANNELS OF BEHAVIOR

- Promotion via Facebook posts.
- Twitter group advertising.

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	User Input	Data uploaded must be of proper format
FR-4	Data Verification and Validation	Data is cleaned and verified for outliers, duplications
FR-5	Data Visualization	Proper charts and graphs are chosen for a particular set of data
FR-6	Business decisions	Recommendations are made according to the data

4.2 NON-FUNCTIONAL REQUIREMENT

Following are the non-functional requirements of the proposed solution

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	It is used for making critical decisions to expand their retail business and can be used by everyone

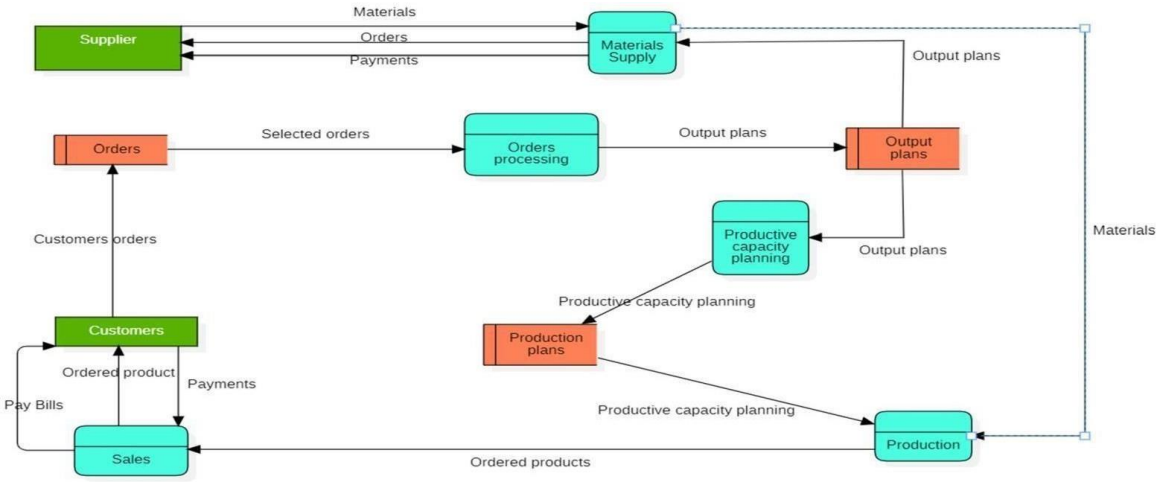
NFR-2	**Security**	It is securable because it has end to end encryption and only accessible to the user with credential details
NFR-3	**Reliability**	It has high reliability based on development and can be accessed using the cloud
NFR-4	**Performance**	It works with high accuracy and efficiency and has the high state of performance
NFR-5	**Availability**	It is available for anyone signed up for the platforms and websites
NFR-6	**Scalability**	It can be extended and elaborated with high datasets

5.PROJECT DESIGN

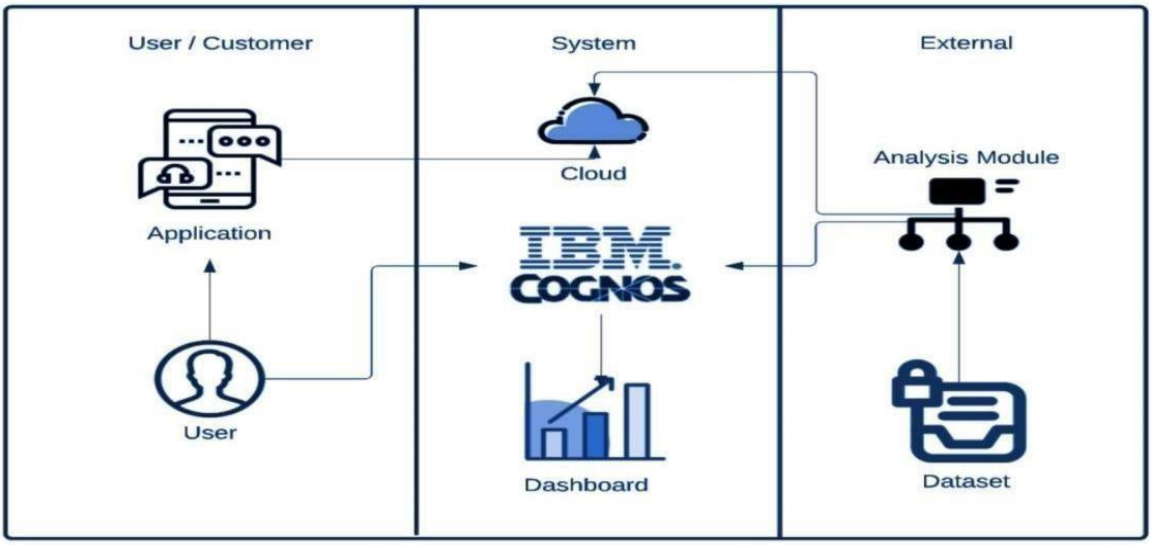
5.1 DATA FLOW DIAGRAMS:

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 Diagrams:



5.2 SOLUTION & TECHNICAL ARCHITECTURE

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

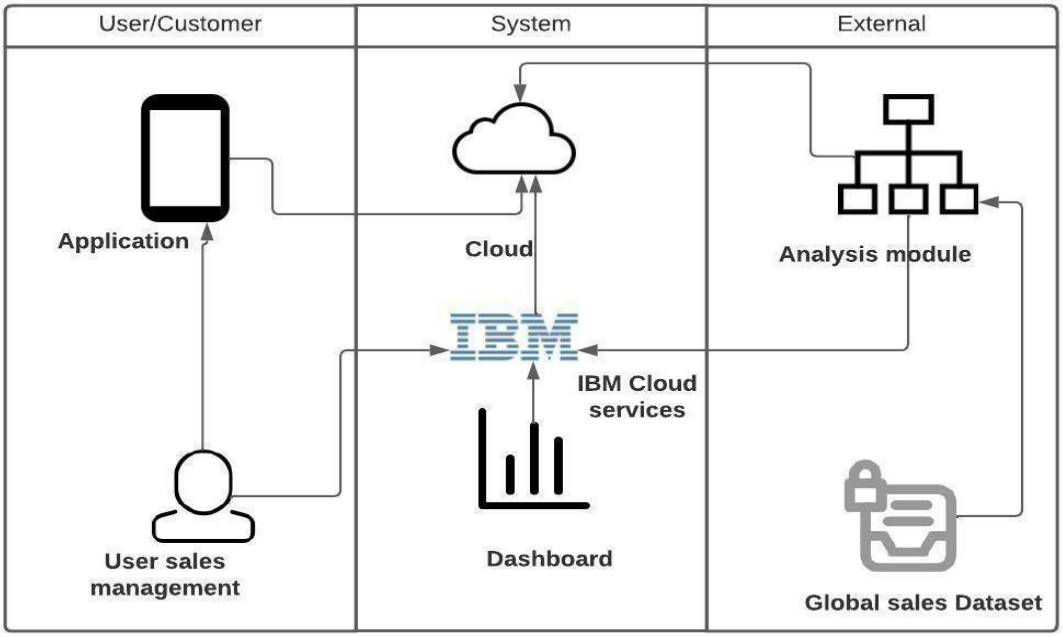


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	IBM Cognos
2.	Application Logic-1	Logic for a process in the application	IBM Cloud
3.	Application Logic-2	Logic for a process in the application	IBM Cognos Analytics
4.	Application Logic-3	Logic for a process in the application	IBM Cognos Analytics
5.	Database	Data Type, Configurations etc.	MySQL
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Cognos Analytics
9.	External API-2	Purpose of External API used in the application	Jupyter Notebook
10.	Machine Learning Model	Purpose of Machine Learning Model	Predictive Analysis Model
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Jupyter Notebook	Python
2.	Security Implementations	Unauthorised access	AES algorithm
3.	Scalable Architecture	Large data sets	IBM Cloud
4.	Availability	Multipage data visualisation charts used for everyone in the login and can be used to finding their prediction	IBM Cognos analytics
5.	Performance	Accuracy and efficiency are increased	IBM Cognos Analytics

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 emailonce I have registered for the application	I can receive confirmation email & clickconfirm	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 byentering 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 AND 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	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	S.Sri Ram, S.Loganathan M.ManojKumar
Sprint-1	Login	USN-2	As a user, I need valid credentials to log in to my application.	1	High	S.Sri Ram, S.Loganathan, M.ManojKumar
Sprint-1	Data Collection	USN-3	As a user, I need to gather the data in the form of CSV/XLS and clean the data	2	High	S.Sri Ram, S.Loganathan, M.ManojKumar
Sprint-2	Upload dataset	USN-4	As a user, I can view the data of the products	1	Low	S.Loganathan, M.ManojKumar, S.SyedThameem
Sprint-2	Data Preparation	USN-5	As a user, I need to filter it for Data visualization.	3	High	S.Loganathan, M.ManojKumar, S.SyedThameem
Sprint-2	Data visualization	USN-6	As a user, I can easily visualize the data in the form of charts.	4	Medium	S.Loganathan, M.ManojKumar, S.SyedThameem
Sprint-3	Dashboard	USN-7	As a user, I can view the summary of the product sales by the help dashboard.	2	Medium	S.Sri Ram, S.Loganathan, M.ManojKumar
Sprint-3	Dashboard	USN-8	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	4	High	S.Sri Ram, S.Loganathan, M.ManojKumar
Sprint-3	Dashboard	USN-9	As a user, I must be able to gain insights from the charts/graphs through a variety of relationships established in the dashboard.	4	Medium	S.Sri Ram, S.Loganathan, M.ManojKumar
Sprint- 4	Prediction	USN-10	As a user, I see the prediction of the specific product's future sales expectation.	4	Medium	S.Sri Ram, S.SyedThameem, S.Loganathan
Sprint- 4	Report	USN-11	As a user, I can view the list of categorized products and their details as a report.	5	High	S.Sri Ram, S.SyedThameem, S.Loganathan
Sprint-4	Story	USN-12	As a user, I can view the product and customer description and more additional information as a story.	5	High	S.Sri Ram, S.SyedThameem, S.Loganathan

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	4	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	2	6 Days	31 Oct 2022	05 Nov 2022	20	06 Nov2022
Sprint-3	2	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov2022
Sprint-4	2	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov2022

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Velocity:

Sprint 1:

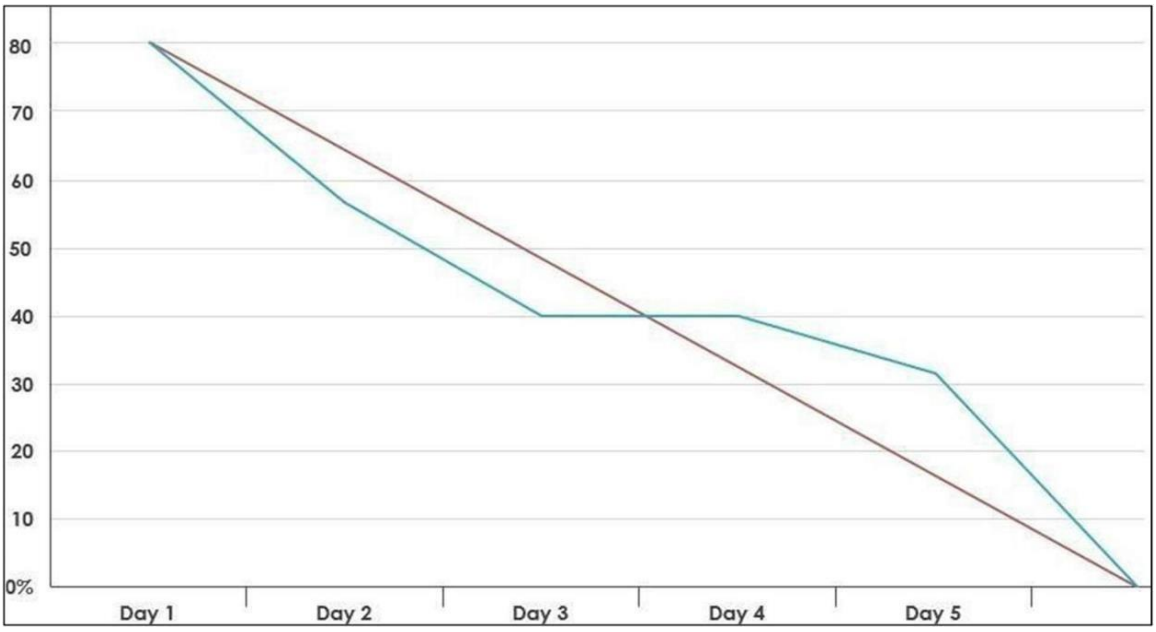
AV for sprint 1= Total story points/ Sprint Duration =4/6=0.666 Sprint 2:

AV for sprint 2= Total story points/Sprint Duration=2/6=0.333 Sprint 3:

AV for Sprint 3= Total story points/ Sprint Duration =2/6=0.333 Sprint 4:

AV for Sprint 4=Total story points/ Sprint Duration =2/6=0.333

Burndown Chart:



6.2 SPRINT DELIVERY SCHEDULE

Title	Description	Date
Literature Survey and Information Gathering	Gathering Information by referring the technical papers, research Publications.	1 September 2022
Prepare Empathy Map	To capture user pain and gains Prepare List of Problem Statement	12 September 2022
Ideation	Prioritize a top 3 ideas based on feasibility and Importance	19 September 2022
Proposed Solution	Solution include novelty, feasibility, business model, social impact and scalability of solution	24 September 2022
Problem Solution Fit	Solution fit document	1 October 2022
Solution Architecture	Solution Architecture	1 October 2022
Customer Journey	To Understand User Interactions and experiences with application	9 October 2022
Functional Requirement	Prepare functional Requirement	15 October 2022

Data flow Diagrams	Data flow diagram	15 October 2022
Technology Architecture	Technology Architecture diagram	16 October 2022
Project Development-Delivery of sprint 1,2,3 &4	Develop and submit the developed code by testing it	24 October 2022 – 19 November 2022

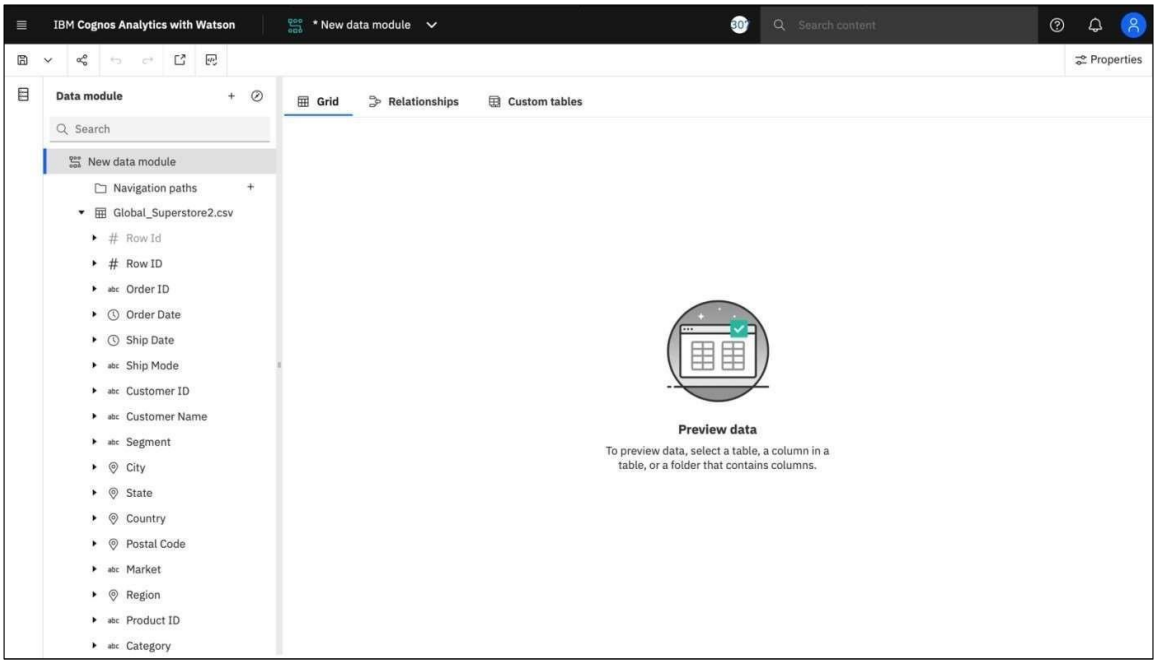
7.CODING & SOLUTIONING

FEATURE 1

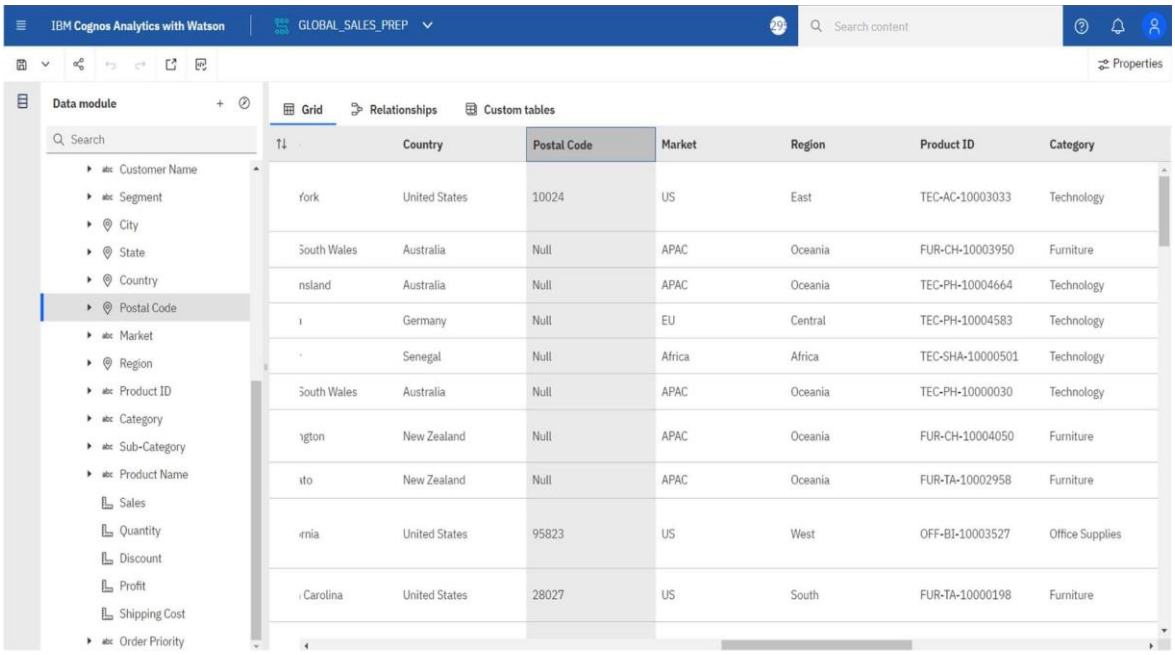
An interactive dashboard has been embedded

(https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FGlobal_Superstore2_datadashboard&action=view&mode=dashboard&subView=model0000018476edaeab_00000002).

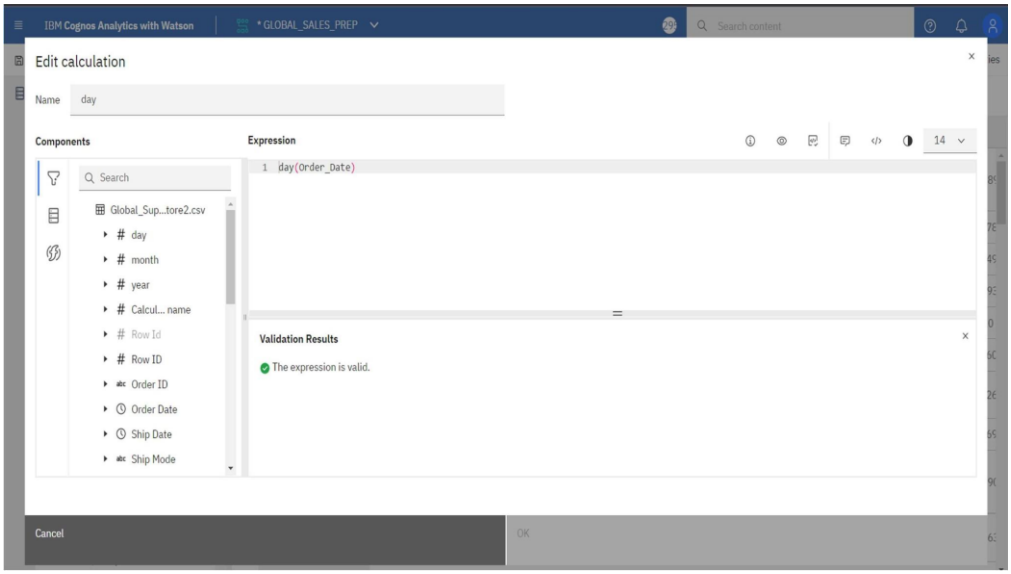
Global Superstore Data Upload

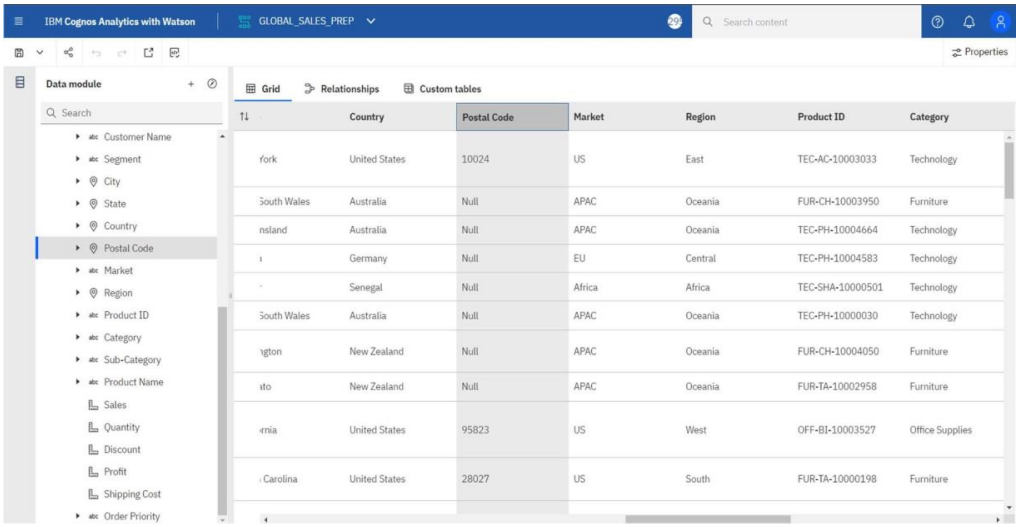


Global Superstore_Data Preparation

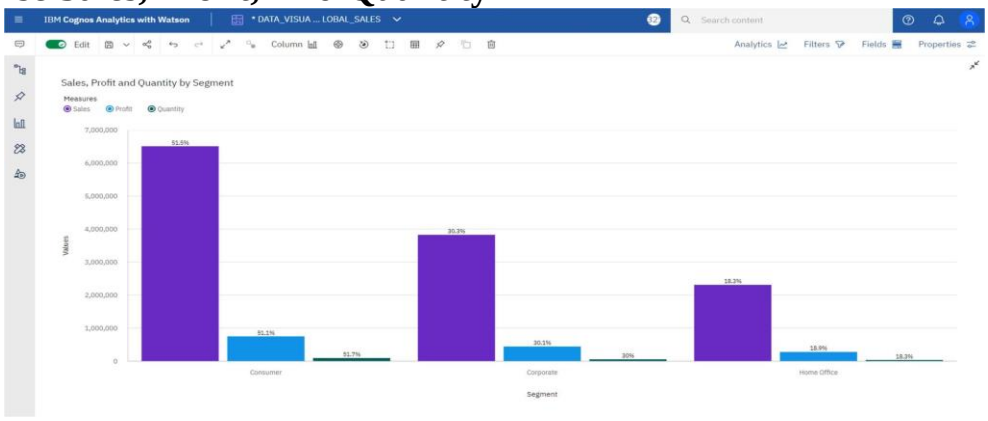


Date Calculations and the Navigation path

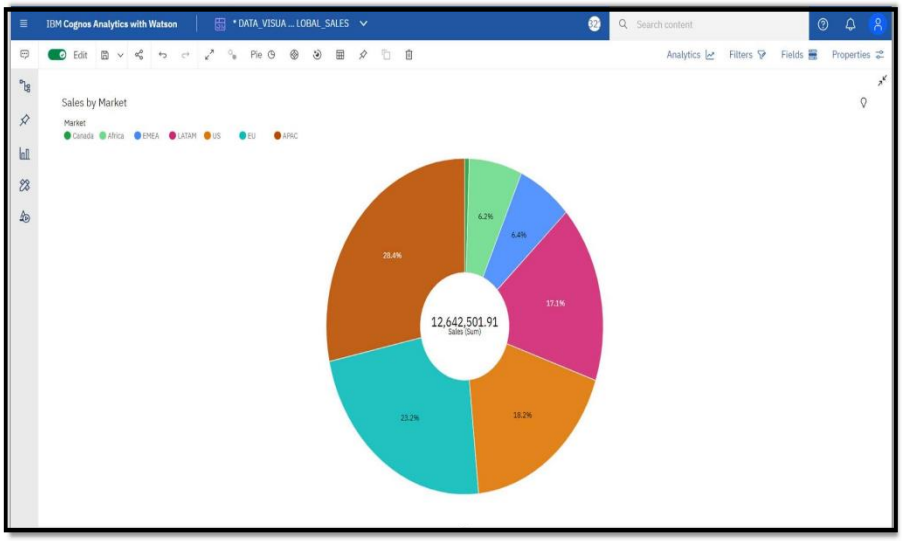




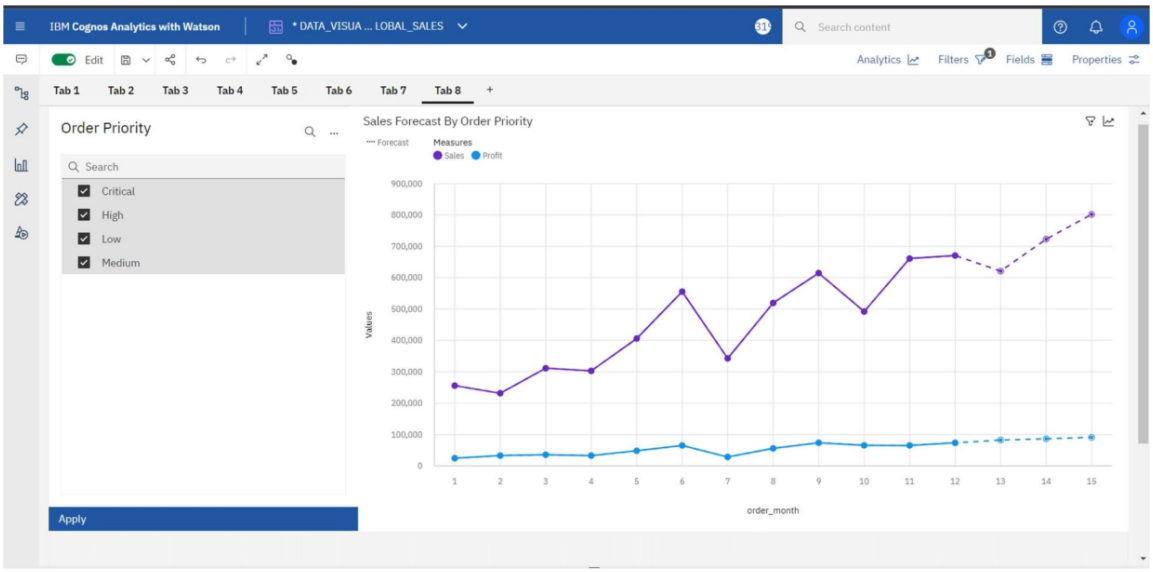
Segment Wise Sales, Profit, And Quantity



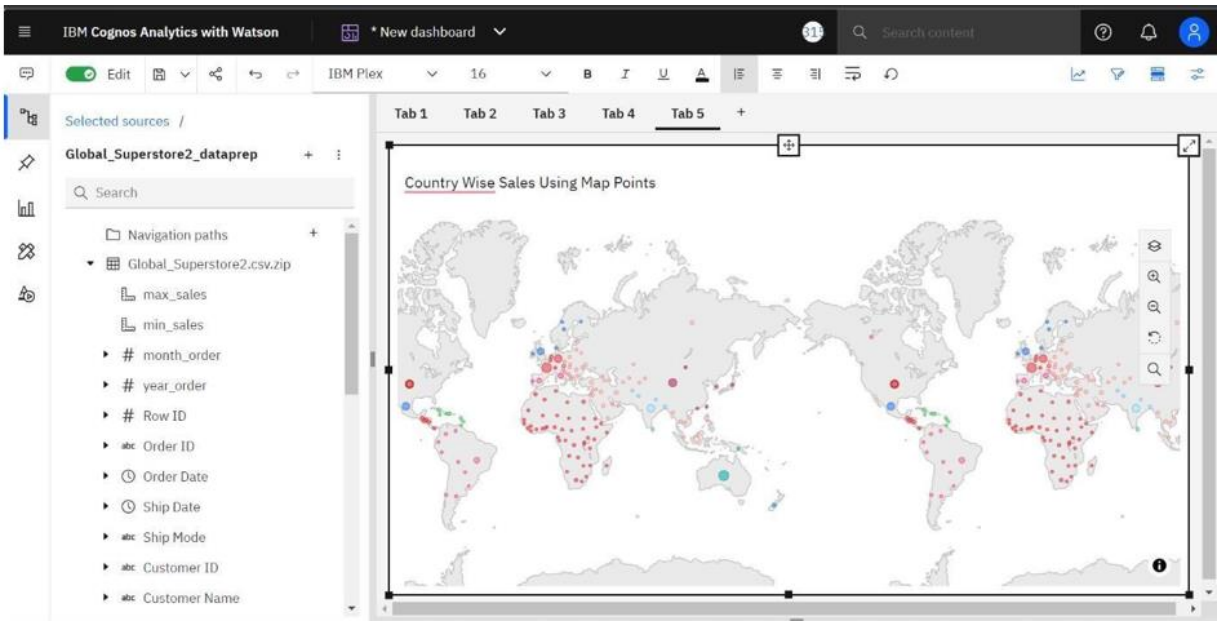
Sales By Market



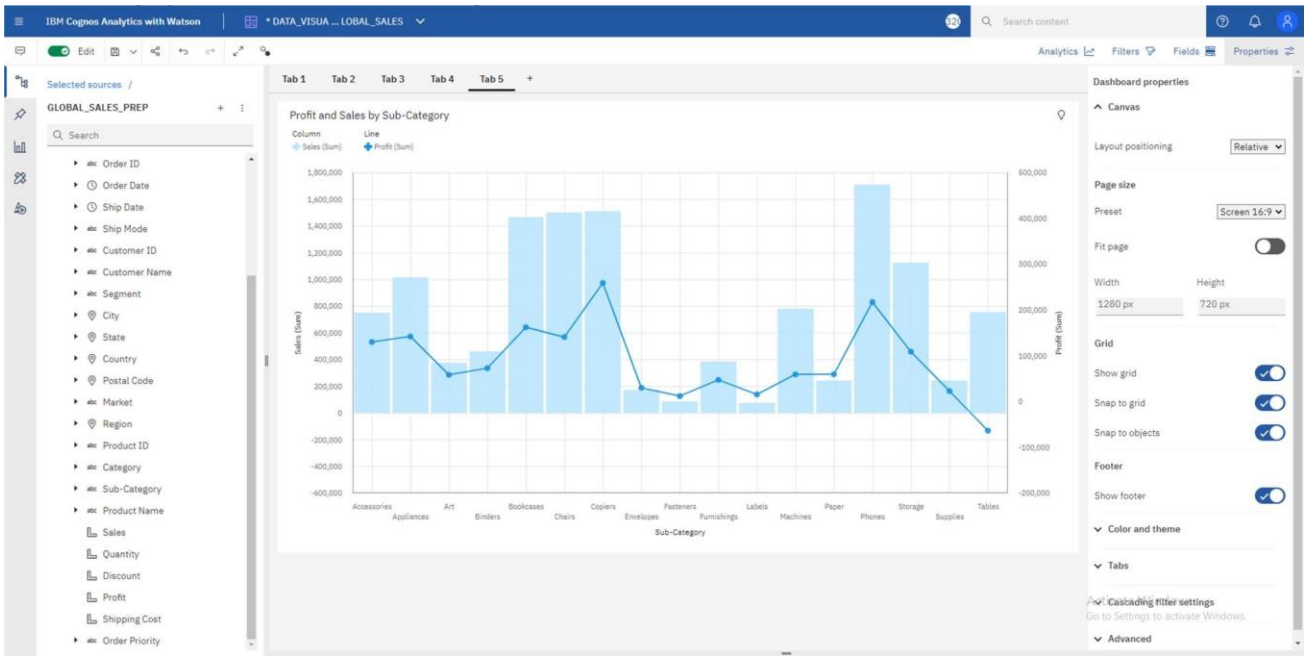
Sales Forecast by order priority



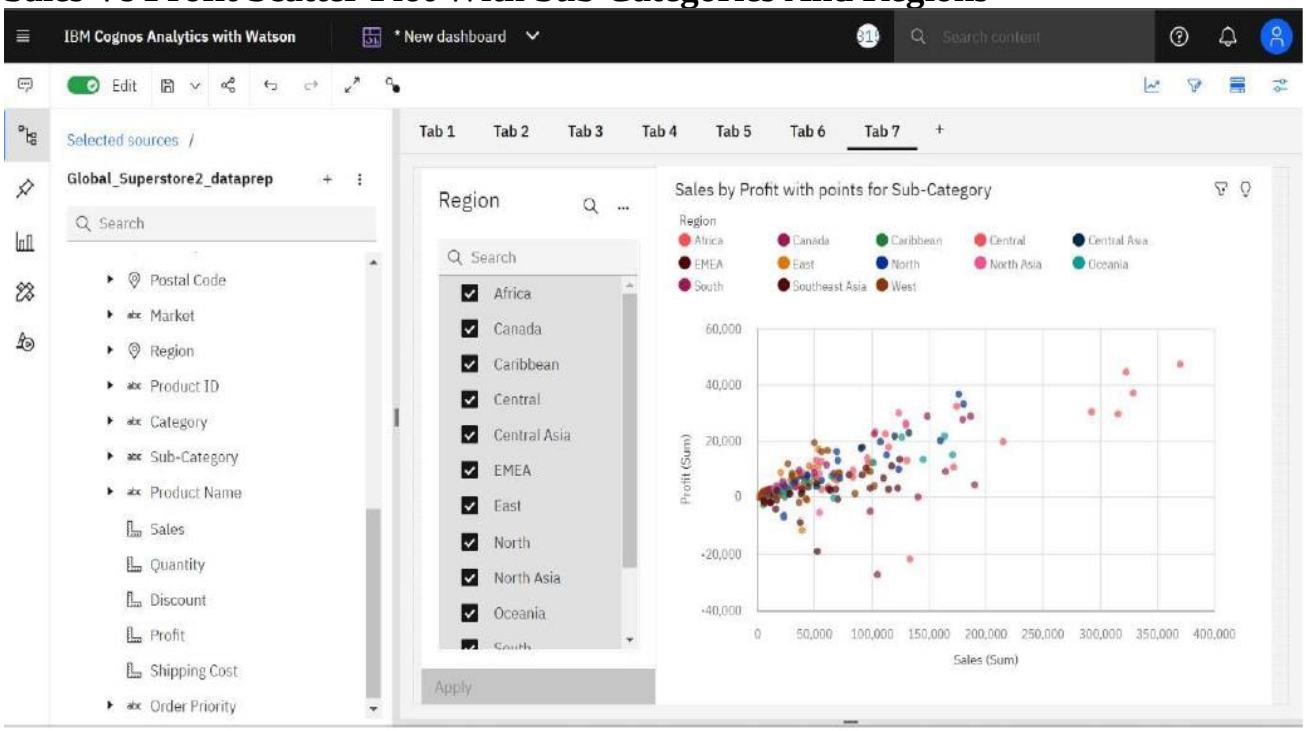
Sales By Sub Category And Sales By Region



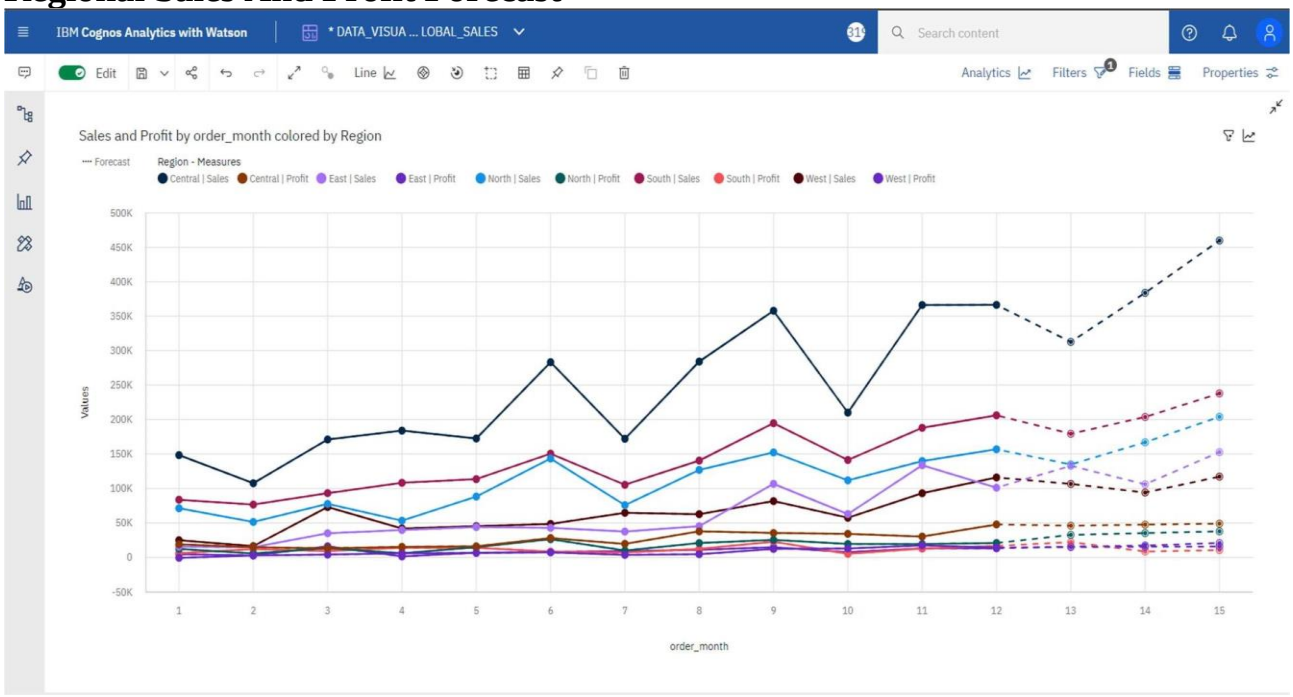
Sub Category Wise Sales And Profits Using Line And Bar Chart



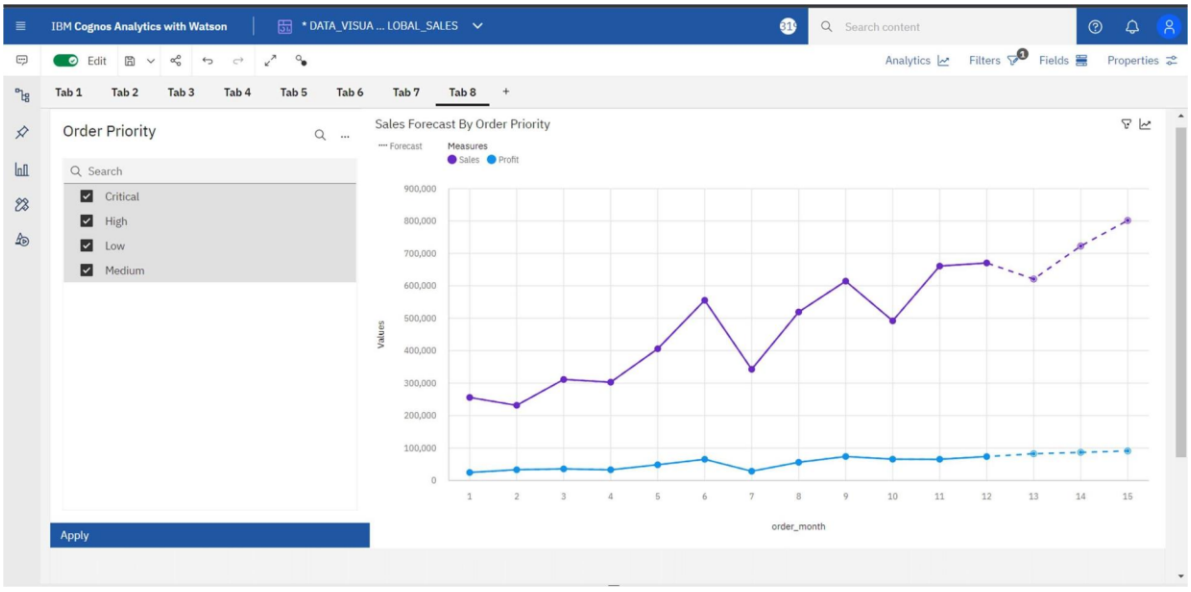
Sales Vs Profit Scatter Plot With Sub Categories And Regions



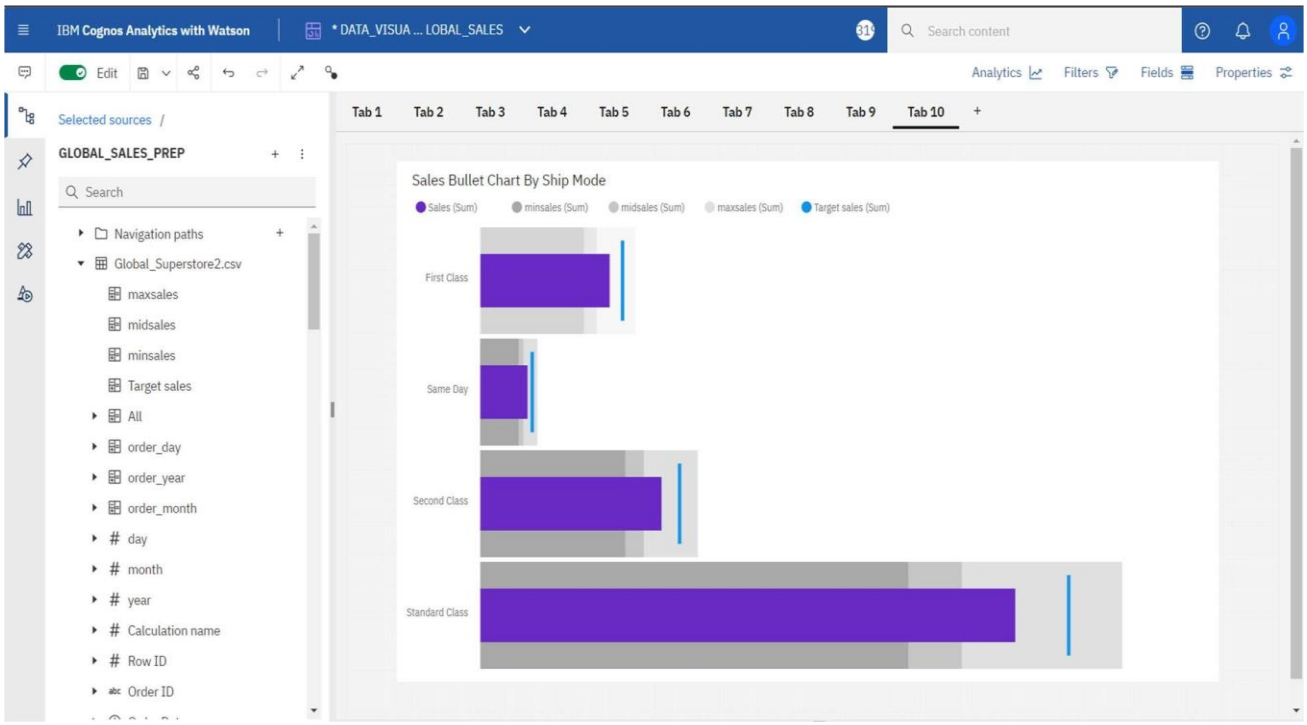
Regional Sales And Profit Forecast



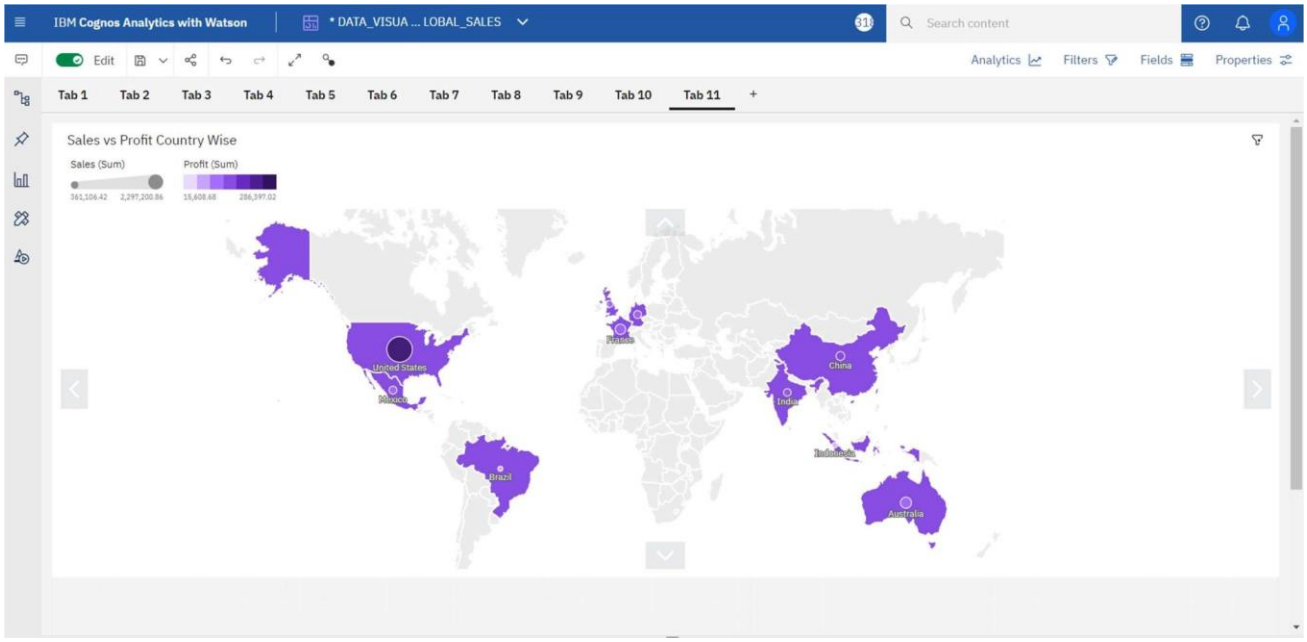
Sales Forecast By Order Priority



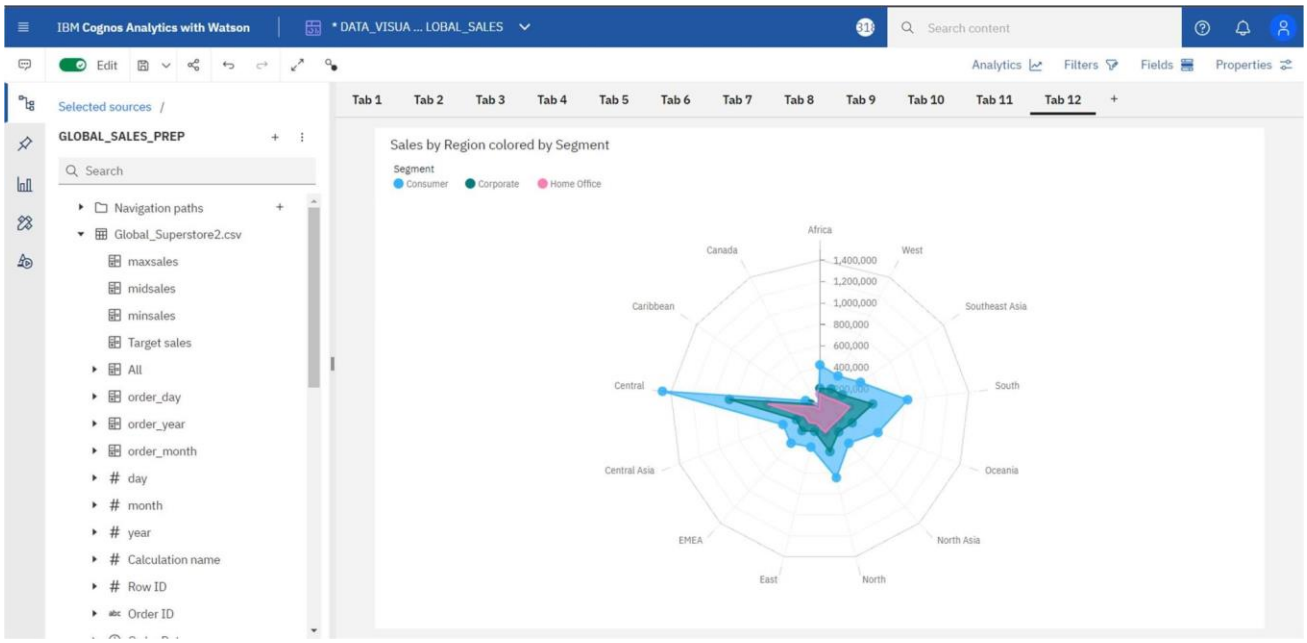
Sales By Segment Analysis



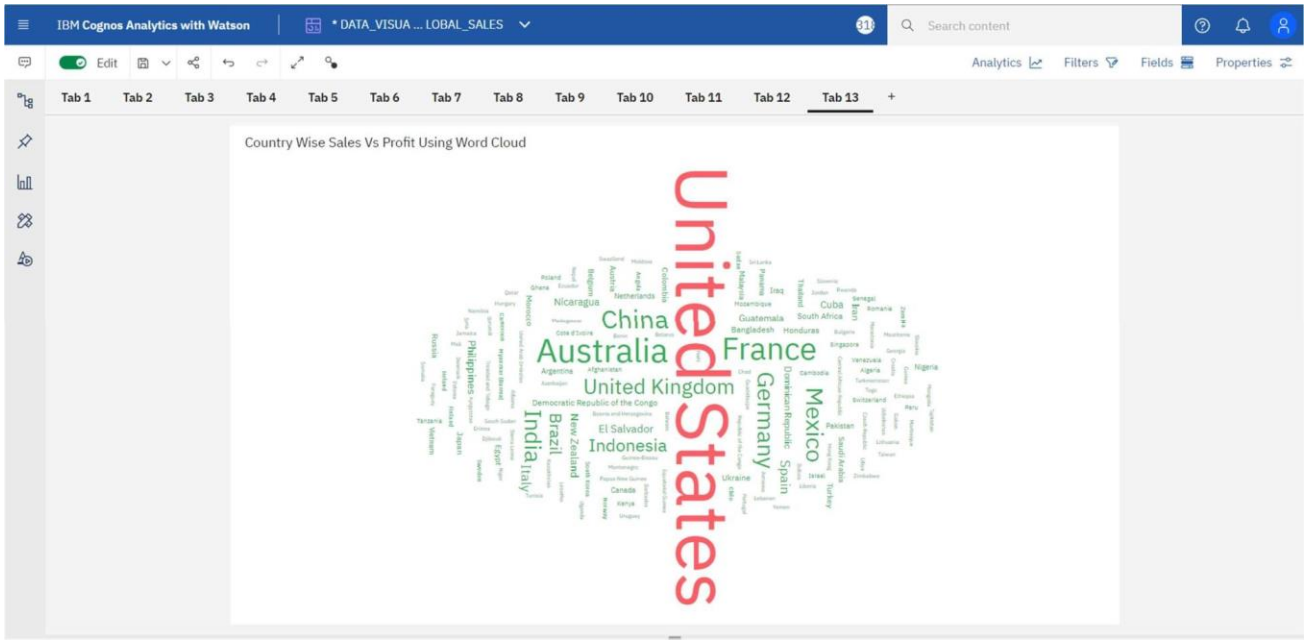
Sales Vs Profit By Countries



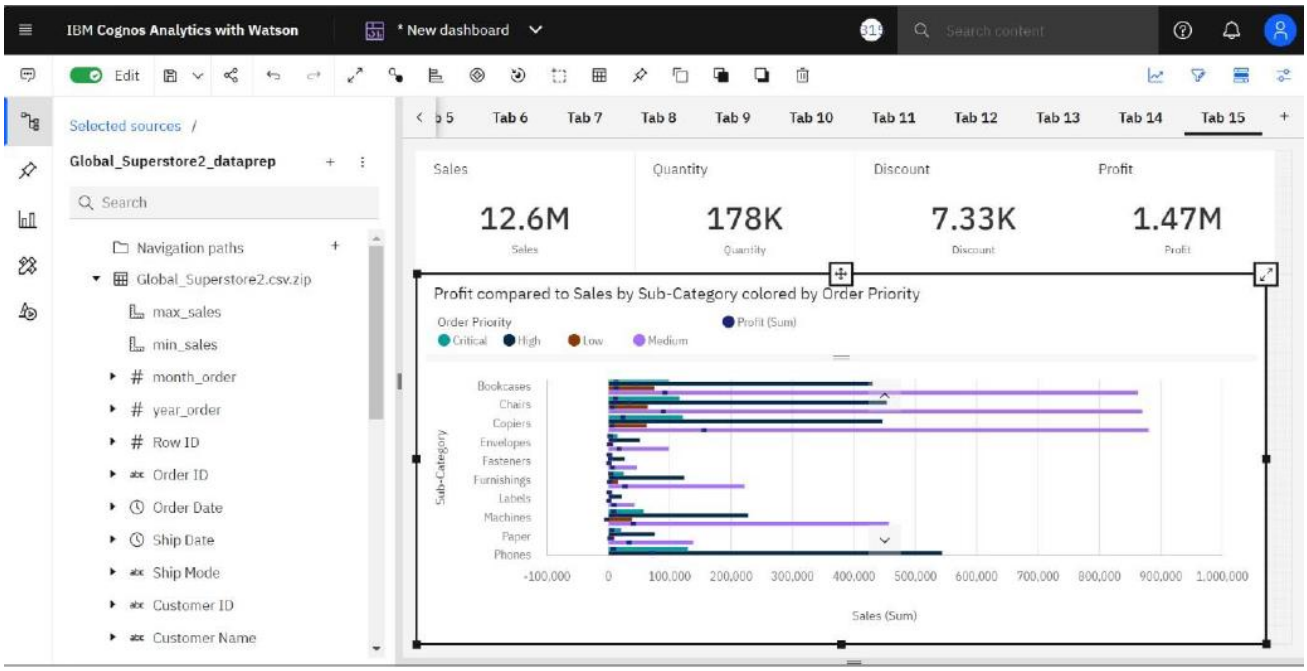
Regional Quantity And Sales Using Radar Chart



Country Wise Sales Vs Profit Using Word Cloud



Sales Dashboard



7.CODING & SOLUTIONS

dashboard.html

```
<!DOCTYPE html>

<html lang="en">

<head>

 <link rel="stylesheet" href="index.css">

</head>

<body>
```

```
    <div class="whole-page">

                        <div
        class="navbar">

     <div class="one">

          <p>Global Sales Data Analytics</p>

        </div>

        <div class="two">

        </div>

        <div class="three">

          <a href="dashboard.html">Dashboard</a>

          <a href="report1.html">Report</a>
<a href="story.html">Story</a>

        </div>

      </div>

      <div class="pic">

       <div>

         <img src="dashboard.JPG">
```

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

report.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <link rel="stylesheet" href="index.css">
</head>
<body>
  <div class="whole-page">
                    <div
      class="navbar">
   <div class="one">
        <p>Global Sales Data Analytics</p>
```

```
    </div>
    <div class="two">
    </div>
    <div class="three">
      <a href="dashboard.html">Dashboard</a>
      <a href="report.html">Report</a>
      <a href="story.html">Story</a>
    </div>
  </div>
  <div class="pic">
   <div>
    <img src="dash1.JPG">
   </div>
   <div>
    <img src="dash2.JPG">
   </div>
   <div>
    <img src="dash3.JPG">
```

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

story.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <link rel="stylesheet" href="index.css">
</head>
<body>
  <div class="whole-page">
    <div class="navbar">
      <div class="one">
        <p>Global Sales Data Analytics</p>
```

```
      </div>
      <div class="two">
      </div>
      <div class="three">
        <a href="dashboard.html">Dashboard</a>
        <a href="report1.html">Report</a>
        <a href="story.html">Story</a>
      </div>
    </div>
    <div class="pic">
      <div>
        <img src="story.JPG">
      </div>
    </div>
  </div>
</body>
</html>
```

index.css

```
.whole-page{
  height:2200
  px;
  display:grid;
  grid-template-rows: 1fr 10fr;
}
.navbar{
  background-color: rgb(255, 255,
  255);display: grid;
  grid-template-columns: 4fr 5fr 5fr;
}
.pic{
  background-color: rgb(255, 255,
  255);display: grid;
```

```
  grid-template-rows:1fr 1fr 1fr ;
}
img{
  width:1
  00%;
}
.one{
  background-color: rgb(255,
  255, 255);text-align: center;
  margin-top: 30px;
}
.two{
  background-color: rgb(255, 255, 255);
}
.three{
  background-color: rgb(255,
  255, 255);display:grid;
  grid-template-columns: 1fr
```

```
    1fr 1fr;text-align: center;
margin-top: 30px;
  }
  p{
    font-
    family:sans-
    serif;font-size:
    25px;
  }
  a{
    font-
    family:sans-
    serif;font-size:
    25px;
    text-decoration:
    none;
    color:black;
```

```
}
a:hover
 {
 color:
 blue;
}
```

8.TESTING

Testing is the process of verifying the accuracy and completeness of project deliverables before they are released to the customer. It is an essential part of quality assurance and helps to ensure that the final product meets the customer's expectations. There are generally four phases of testing in a project: unit testing, integration testing, system testing, and acceptance testing. Each of these phases has its own purpose and focuses on different aspects of the project.

Testing is a critical component of quality management. It is the process of verifying that a project meets its requirements and that it performs as expected. Testing helps ensure that the project is fit for purpose and that it will meet the needs of the customer or client.

8.1 TEST CASES

A test case is a set of actions performed on a system to determine if it satisfies software requirements and functions correctly. The purpose of a test case is to

determine if different features within a system are performing as expected and to confirm that the system satisfies all related standards, guidelines and customer requirements. The process of writing a test case can also help reveal errors or defects within the system.

Test cases are typically written by members of the quality assurance (QA) team or the testingteam and can be used as step-by-step instructions for each system test. Testing begins once the development team has finished a system feature or set of features. A sequence or collection oftest cases is called a test suite. A test case document includes test steps, test data, preconditions and the postconditions that verify requirements.

8.2 USER ACCEPTANCE TESTING

User acceptance testing is the final testing stage in software development before production. It's used to get feedback from users who test the software and its user interface (UI). UAT is usually done manually, with users creating real-world situations and testing how the software reacts and performs. Test-case scenarios can also be automated, simulating a user experience. Due to the costliness of UAT and the complexity of combining manual and automated testing in this phase, it's important to prepare ahead and develop a plan. As a testing plan is created and a timeline is established, it's good to keep in mind some of the challenges that may occur duringthe process.

1. Purpose of Document

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

2. Defect Analysis

This report shows the 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	10	4	3	2	20
Duplicate	0	0	0	0	4
External	0	0	0	0	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	0	0	1	1

Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Hero section	4	0	0	4
Contact Us Section	1	0	0	1
Drop down menus	1	0	0	1
Dashboard	5	0	0	5

9.RESULTS

9.1 PERFORMANCE METRICS

Performance testing is a testing technique that determines the speed, scalability, and stability of an application under a given workload. It helps to ensure the quality of the software andmakes the application ready to be released into the market.

- Speed - The speed at which the application responds.
- Scalability - The maximum user load that the application can handle.
- Stability - The condition of the application under varying loads.

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	No of Visualizations / Graphs - 7-8 visualization/6-7 graphs
2.	Data Responsiveness	Users and Analyst or Developers
3.	Amount Data to Rendered (DB2Metrics)	5 countries
4.	Utilization of Data Filters	Sales ,profit, products, market rate and order id filtration
5.	Effective User Story	No of Scene Added - 30 user stories
6.	Descriptive Reports	No of Visualizations / Graphs - 4 visualizations/6 graph

10.ADVANTAGES & DISADVANTAGES

10.1 ADVANTAGES

- **Data analytics helps an organization make better decisions**

Many organisational decisions are made based on gut instinct rather than facts and data. One reason for this could be a lack of access to high-quality data that can aid in decision-making. Analytics can assist in transforming available data into valuable information for executives, allowing them to make better decisions. If fewer bad decisions are made, this can be a source of competitive advantage because bad decisions can have a negative

impact on a variety of areas, including company growth and profitability.

- **Increase the efficiency of the work**

Analytics can help analyse large amounts of data quickly and present it in a structured manner to aid in the achievement of specific organisational goals. It fosters an efficient and collaborative culture by allowing managers to share insights from analytics results with employees. Gaps and areas for improvement within a company become apparent, and actions can be taken to increase overall workplace efficiency, thereby increasing productivity.

The analytics keeps you informed of changes in your customers' behaviour.

Customers have numerous options in today's world. Organizations that are not in tune with customer desires and expectations can quickly find themselves in a downward spiral. Customers' opinions change as they are constantly exposed to new information in this digital age. With such a large volume of customer data, it is nearly impossible for organisations to make sense of all the changes in customer perception data without the assistance of analytics. Analytics provides insights into how your target market thinks and whether there has been any change. As a result, being aware of changes in customer behaviour can provide a decisive advantage to businesses.

- **Personalization of goods and services**

Gone are the days when a company could sell a standard set of products and services to customers. Customers want products and services that can cater to their specific requirements. Analytics can assist businesses in tracking which services, products, or content are preferred by customers and then displaying recommendations based on their preferences. For example, on social media, we typically see what we want to see; all of this is made possible by the data collection and analytics that companies perform. Data analytics can assist in providing tailored services to customers based on their specific needs.
Improving the quality of products and services

Data analytics can help to improve the user experience by detecting and correcting

errors.

10.2 DISADVANTAGES

Lack of coordination among teams

There is a lack of coordination among various teams or departments within an organisation. However, the insights generated by these teams are either insignificant or have a minor impact on organisational metrics. This could be due to a "silos" approach to working, with each team using only their existing processes and being disconnected from other departments. The analytics team should be focused on answering the right business questions, and the results generated by data analytics teams should be properly communicated to the right employees in order to drive the right set of actions and behaviours that can have a positive impact on the organisation.

- **Lack of commitment and patience**

Analytics solutions are not difficult to implement; however, they are expensive, and the return on investment is not immediate. It may take time to put processes and procedures in place to begin collecting data, especially if existing data is not available. Analytics models, by definition, improve in accuracy over time and necessitate commitment to implement the solution. Because business users do not see immediate results, they may lose interest, resulting in a loss of trust and the models failing.

When an organisation decides to implement data analytics methods, a feedback loop and mechanism must be in place to understand what is working and what is not, and corrective actions must be taken to fix broken things. Senior would be unable to function without this closed loop system.

- **Low quality of data**

One of the most significant limitations of data analytics is a lack of access to high-quality data. Companies may already have access to a large amount of data, but the question is whether they have the right data. A top-down approach is required, in which

the business questions that must be answered are identified first, and the data needed to answer these questions is then determined.

In some cases, data collected for historical reasons may not be appropriate to answer the questions we ask today. At times, even if we have the right metrics on which to collect data, the quality of the data collection may be poor. There could be

Privacy concerns

Customers' privacy may occasionally be violated by data collecting since organisations whose services they use have access to information about their purchases, online transactions, and subscriptions. For mutual benefit, certain businesses might trade their datasets with other businesses. A person, a nation, or a community could potentially be attacked using certain obtained data. Businesses must be careful about the type of client data they acquire and maintain its protection.

Complexity & Bias

Some of the analytics tools created by businesses resemble a black box approach more than others. It's unclear what's going on within the "black box," or it's not immediately clear what logic the system employs to build a model by learning from data. For instance, a neural network model that decides who should be approved for a loan and who should be rejected.

11.CONCLUSION

Data availability, low-cost commodity hardware, and new information management and analytic software have resulted in a once-in-a-lifetime opportunity in the history of data analysis. Because of the convergence of these trends, we now have the capabilities to analyse massive data sets quickly and cheaply for the first time in history. These abilities are neither theoretical nor insignificant. They represent a genuine step forward and an unmistakable opportunity to realise enormous gains in efficiency, productivity, revenue,

and profitability.

Sales analytics is a must-have tool for businesses all over the world. It keeps our company up to date. This is a must-have component; otherwise, our company will not survive in a highly competitive industry. Improves insights through data visualisation.

12.FUTURE SCOPE

Global Sales Data Analytics removes the need for guesswork and manual tasks. Whether it's selecting the right content, planning marketing campaigns, or creating new products. Organizations can use data analytics insights to make more informed decisions. As a result, better outcomes and customer satisfaction are achieved. We can easily identify the profit and loss for the company by visualising the data with bar charts, pie charts, and so on.

In the future, we will be able to determine when a customer purchases the next product and how long it took to deliver the product. We gain a better understanding of the types of items that customers seek, product returns, and so on, and will be able to forecast sales and profit for the next quarter.

13.APPENDIX

13.1 GITHUB AND PROJECT VIDEO LINK

Github Link- https://github.com/IBM-EPBL/IBM-Project-14772-1659589748

Project Video Link-https://drive.google.com/file/d/1mOAuLkmiR0Kfk-YNFvzrk29ZN8BlMVDf/view?usp=drivesdk