GLOBAL SALES DATA ANALYTICS

A PROJECT REPORT

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ABSTRACT

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This Project is mainly streamed towards Global Sales data Analytics done using a data analyzing tool IBM Cognos. Sales analysis is using data to evaluate sales team performance. It provides valuable insights about the top performing and underperforming products/services, selling and market opportunities, and includes sales forecasting. Regular sales data analysis provides an understanding of the products that your customers are buying and helps in dissect why they are behaving in a certain way. This sales analysis involves justifying the trends and observations in sales-related data with reasonings. Sales reporting and analysis will mean dealing with lots of data. Sales data analysis and interpretation will also fetch intel on your non-customers. The information is invaluable for sharpening your sales pitch and personalizing your future marketing activities to find new customers.

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INTRODUCTION

CHAPTER 1

INTRODUCTION

The introduction about the Global Sales data Analytics is briefly discussed in this chapter.

1.1 PROJECT OVERVIEW

Sales analysis is using data to evaluate sales team performance. It provides valuable insights about the top performing and underperforming products/services, selling and market opportunities, and includes sales forecasting. Regular sales data analysis provides an understanding of the products that your customers are buying and helps in dissect why they are behaving in a certain way. It can also find patterns in your lead conversions and drop offs. All of these aspects enable you to optimize your sales process. This type of sales analysis is about finding patterns in sales data (whether they are going up or down) over a specific timeframe. A micro trend might last for a week for a specific product, while a macro trend might last for a quarter over a range of products. It can involve conducting a strictly financial analysis based on the sales revenue generated and how it's meeting your sales targets. Sales management reports are important to monitor the effectiveness of your sales reps and help them identify selling opportunities in customer interactions.

1.2 NEED OF DATA ANALYTICS IN SALES

This sales analysis involves justifying the trends and observations in sales-related data with reasonings. For example, the increased competition in the industry might lead to a decrease in your product sales. Sales leaders conduct internal diagnostics to identify the roadblocks for their teams, list their observations, and brainstorm ways to improve. Sales data analysis and interpretation are based on your past sales data, but market research can fill in the gaps of such analyses. For sales directors, it serves as a gateway into the future. Sales reporting and analysis will mean dealing with lots of data. Sales data analysis and interpretation will also fetch intel on your non-customers. The information is invaluable for sharpening your sales pitch and personalizing your future marketing activities to find new customers.

LITERATURE REVIEW

CHAPTER 2

LITERATURE REVIEW

The introduction about the literature review gone through for the project are briefly discussed in the chapter.

Title	Author	Year	Abstract
Sales Management A Global Perspective	John B Ford, Earl Honeycutt, Antonis Simintiras	2003	cross-cultural negotiations, Customer Relationship Management (CRM), sales territory design and management.
Real-World Data Analytics in Global Pharmaceutical Marketing.	Rath, Badal, Kar, Surjit Kumar	2016	Randomized Controlled Trials (RCT) data, Real-World Data (RWD) , includes topic about efficiency of both in pharmaceutical

IRIS: A goal-oriented big data analytics framework on Spark for better Business decisions	Grace Park, Sooyong Park, Latifur Khan, Lawrence Chung	2017	Big data analytics framework in business context, IRIS framework and an assistant tool using Spark which is a real-time big data analytics platform
Big data analytics in E-commerce: a systematic review and agenda for future research	Shahriar Akter Samuel Fosso Wamba	2016	This Paper explores BDA in e-commerce by drawing on a systematic review of the literature. The paper also triggers broader discussions regarding future research challenges and opportunities in theory and practice.

IDEATION & PROPOSED SOLUTION

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 EMAPTHY MAP

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviors and attitudes. It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenge.
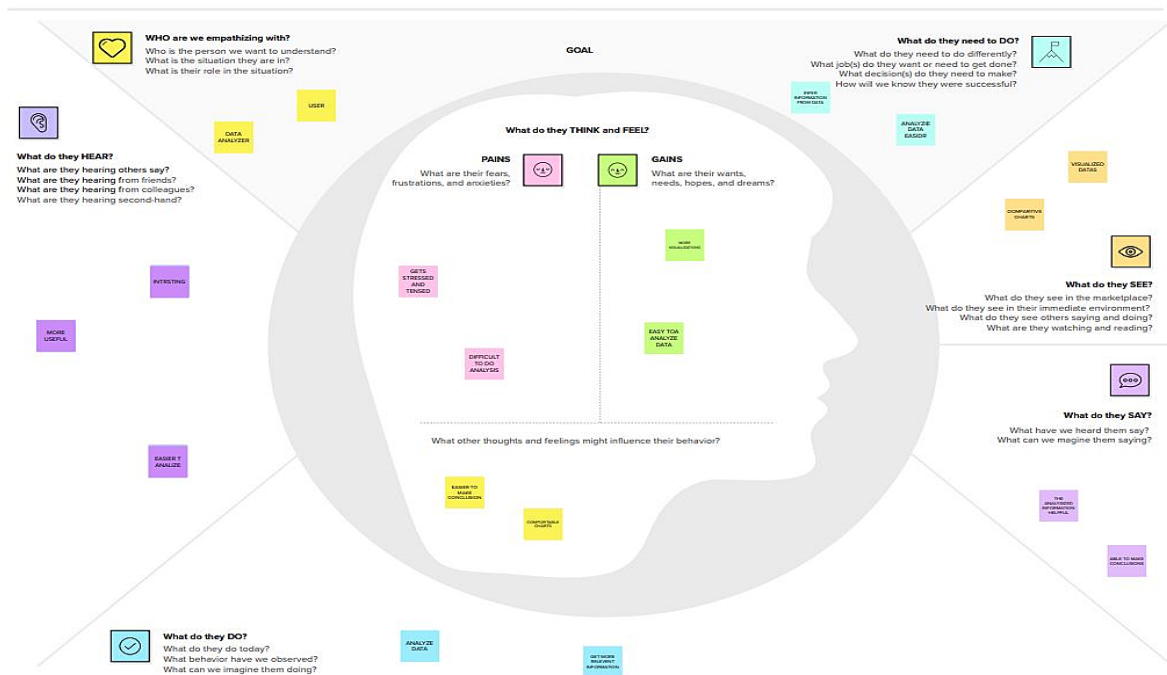

Figure 3.1 Empathy Map

3.2 IDEATION & BRAINSTROMINGS

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 number of creative solutions.

Figure 3.2 Brain Storming 1

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.
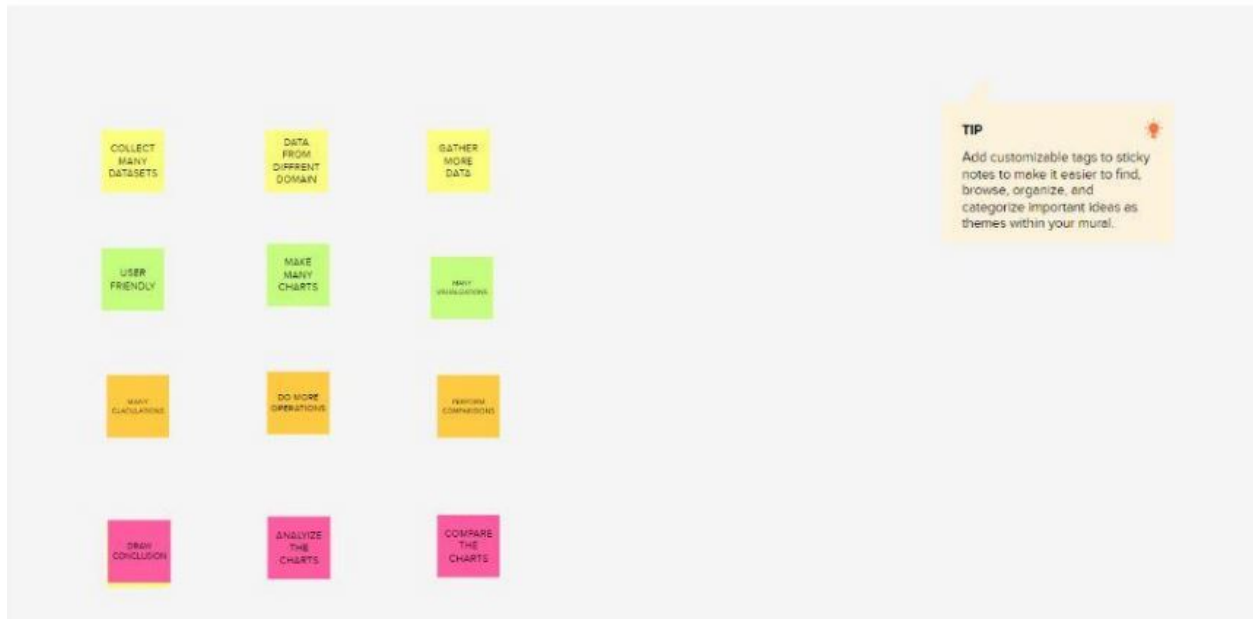
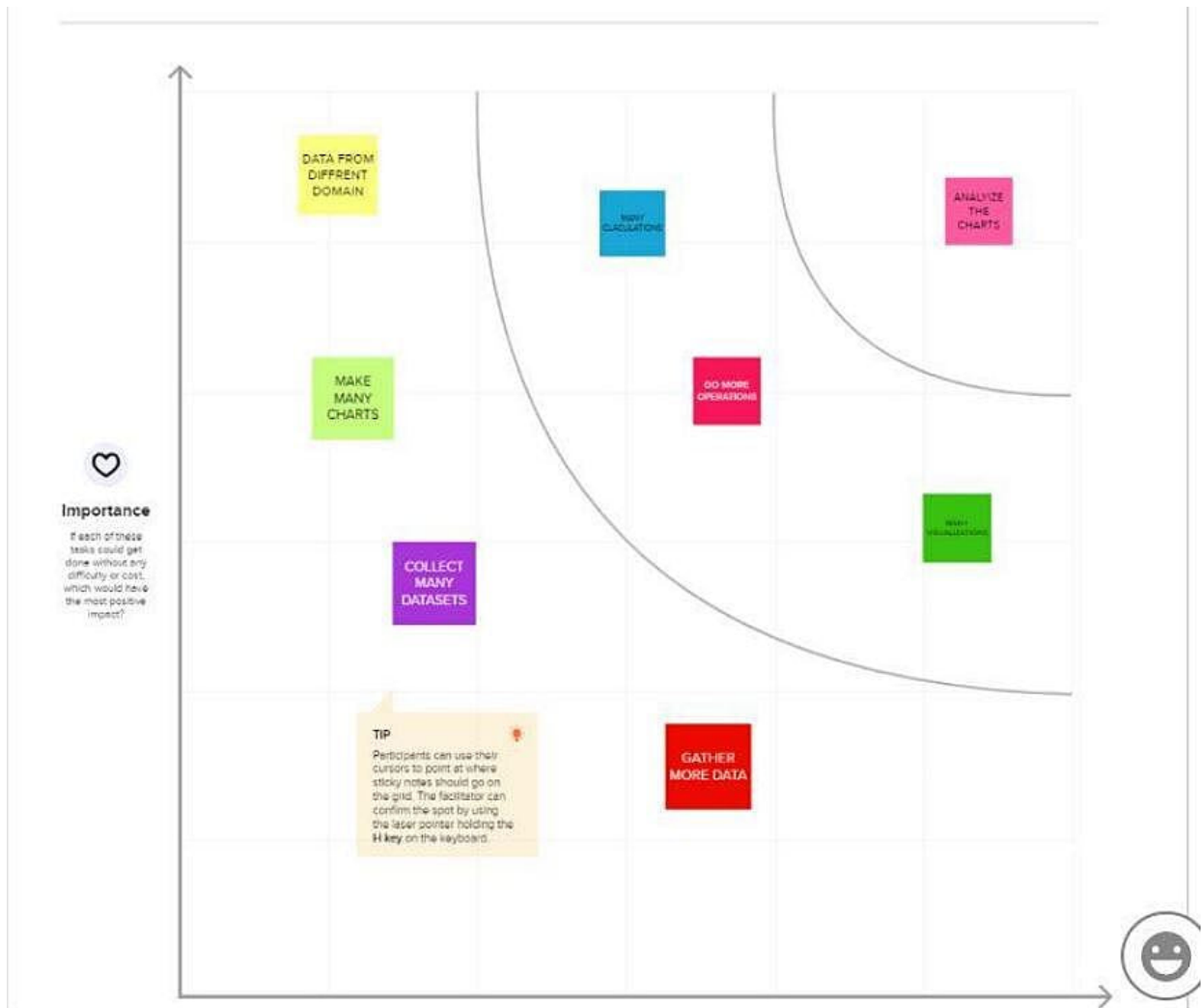⏲ 20 minutes

Figure 3.3 Brain Storming 2

Figure 3.4 Brain Storming 3

3.3 PROPOSED SOLUTION

S. No	Parameter	Description
1.	Problem Statement (Problem to be solved)	The goal of sales analytics is to gather sales data and gauge sales performance to simplify the information and help understand sales trends, overall performance

		with the help of visualization.
2.	Idea / Solution description	Sales analytics refers to the use of technology to collect and use sales data to derive actionable insights. It is used to identify, optimize, and forecast sales. It uses different metrics and KPIs to plan an efficient sales model that generates higher revenue for the business. Users can create multiple analytical graphs/charts/Visualizations using the Analytical Visualizations and can build the required Dashboards. Saving and visualizing the final dashboard in the IBM Cognos Analytics.

3.	Novelty / Uniqueness	Measuring performance with sales analytics helps sales and marketing teams to review their strategies and performance in order to make improvements. Shopping online is currently the need of the hour; scales analytics provides valuable information like Customer Analysis and Product Analysis to improve sales methodologies. Users create multiple analytical graphs/charts/Visualizations. It involves usage of IBM Cognos Analytics for building required dashboards using analytical visualizations.
4.	Social Impact / Customer Satisfaction	Analysing sales help businesses in understanding their most profitable products and the ones that aren't moving, most profitable customers, and potential sales opportunities thereby providing products/services which matches customer needs and meets their satisfaction.

5.	Business Model (Revenue Model)	1.Improve the decision-making process oriented at analysing scales trends, reducing costs and increasing business revenue. 2. Sales analytics can use the analysed sales data and provide actionable insights for selling a product or service to a consumer or business.
6.	Scalability of the Solution	It can also analyse wide range of datasets and different types of visualisations can be done.

3.4 PROBLEM SOLUTION FIT

Figure 3.5 Problem Solution Fit

REQUIREMENT ANALYSIS

CHAPTER 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
FR-2	Data partition	separating customer, product, geographical and seasonal details.
FR-3	Data analyse	Analyse the targeted region, customer and sales of the product
FR-4	Dashboard	Display the analyse results

4.2 NON-FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The system is used to analyse the targeted region, customer and sales of the product.
NFR-2	Security	The system provides utmost security and the user details are in a very secured environment under the control of the administrator.

NFR-3	Reliability	The dashboard of the system is highly reliable and chances of data loss is low.
NFR-4	Performance	The dashboard of the system is highly reliable and chances of data loss is low.
NFR-5	Availability	The system is available anytime and can be accessed anywhere.
NFR-6	Scalability	the application to handle an increase in workload without performance degradation

PROJECT DESIGN

CHAPTER 5

PROJECT DESIGN

5.1 DATAFLOW DIAGRAM
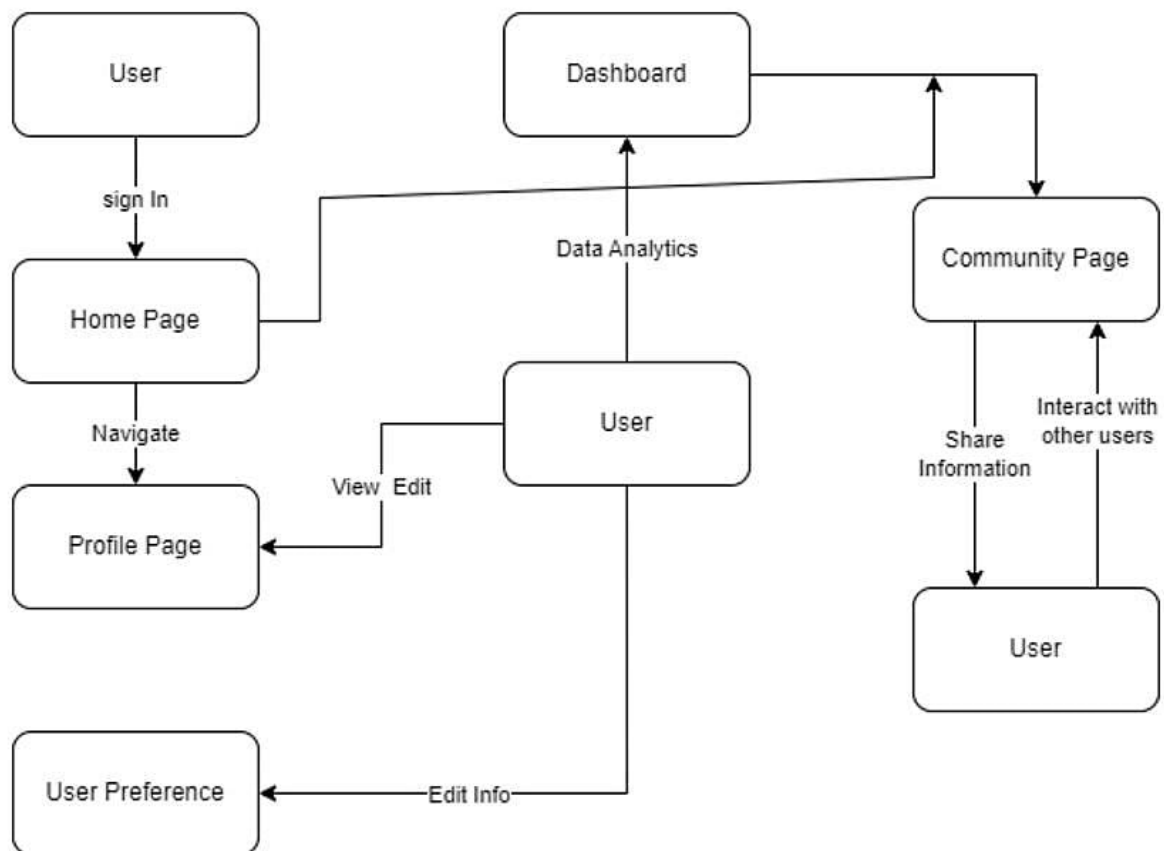
Figure 5.1 Dataflow Diagram

5.2 SOLUTION ARCHITECTURE
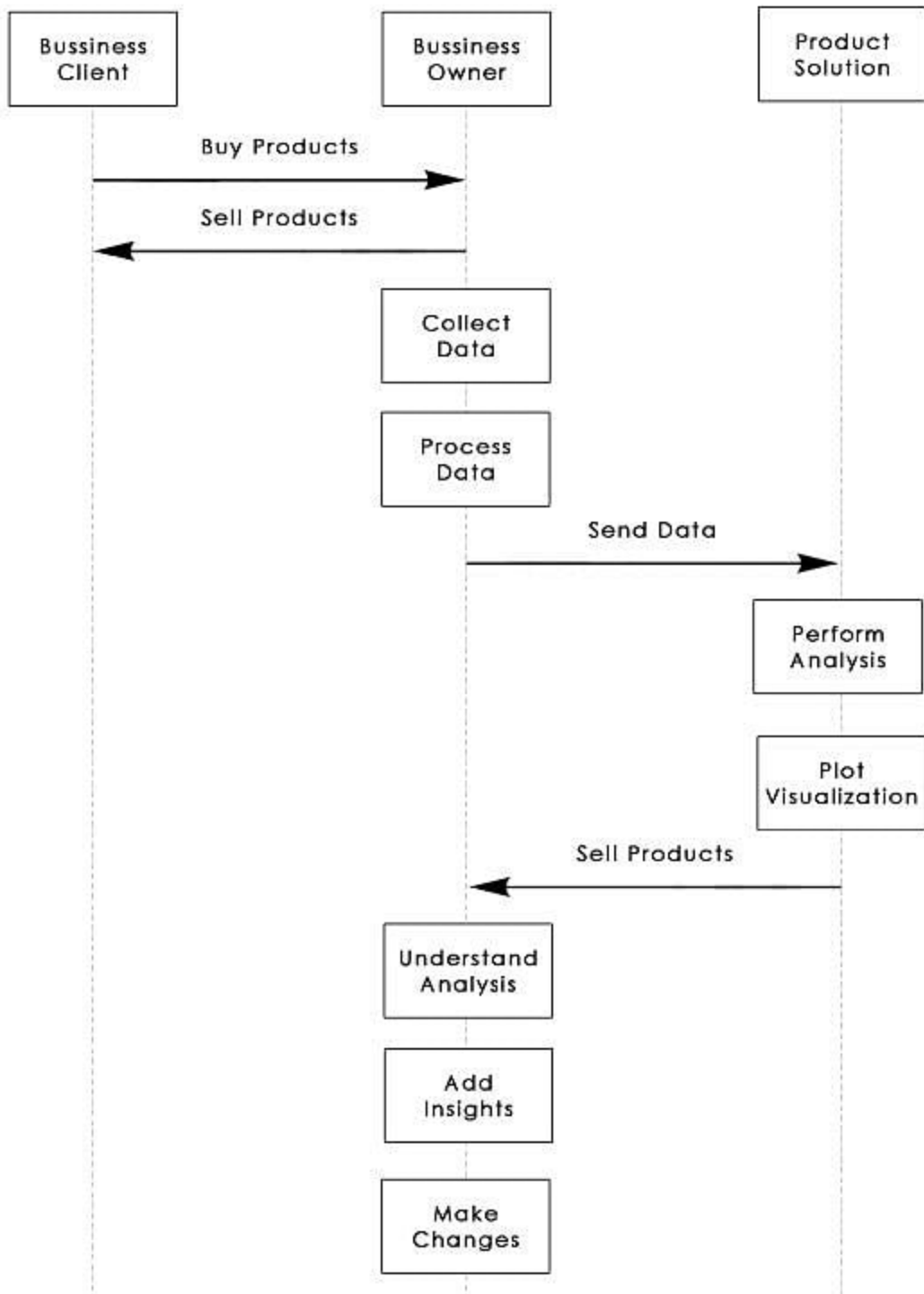
Figure 5.2 Solution Architecture

5.3 TECHNOLOGY ARCHITECTURE
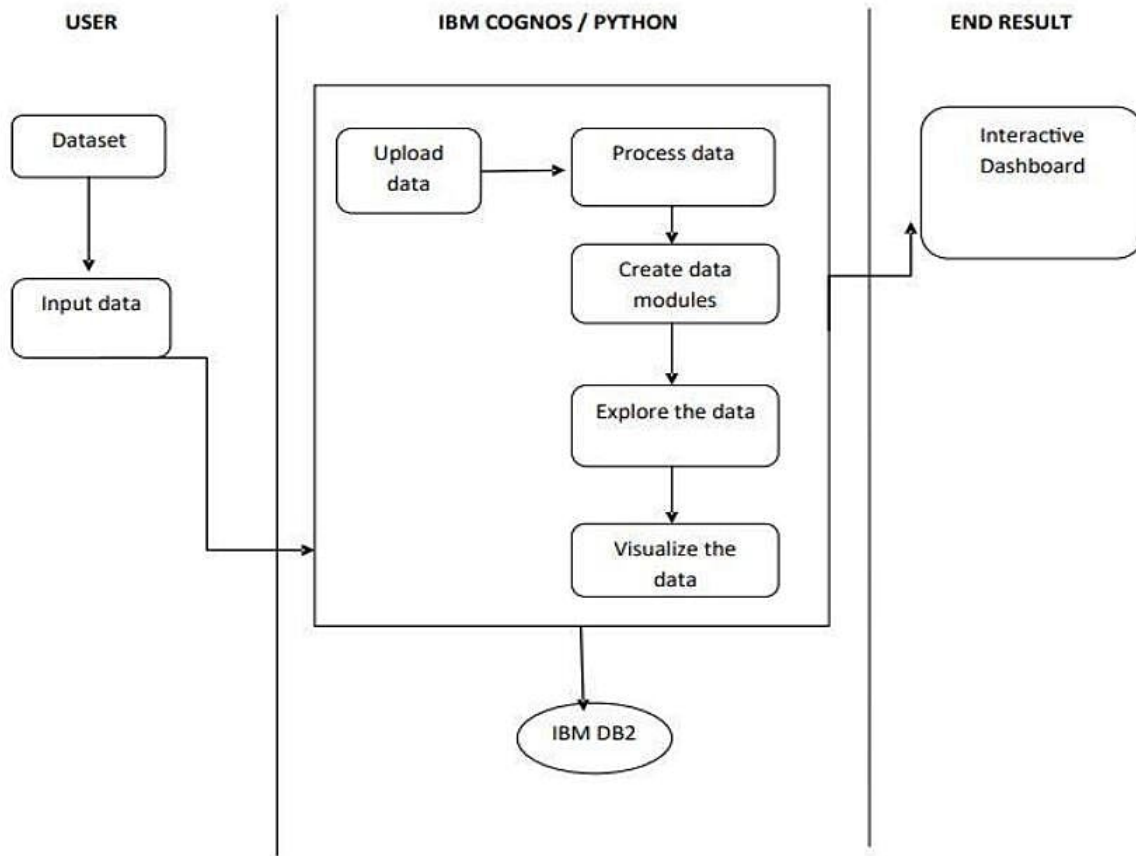
Figure 5.3 Technology Architecture

5.3.1 COMPONENTS AND TECHNOLOGIES

S No.	Component	Description	Technology
1.	User Interface	Web UI-IBM cognos	HTML
2.	Application Logic-1	Preparing the dataset	Python
3.	Application Logic-2	Data Exploration	IBM Cognos
4.	Application Logic-3	Data Visualization	IBM Cognos

5.	Cloud Database	Database Service on Cloud	Database Service on Cloud
6.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local File system
7.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration:	Local, Cloud Foundry, Kubernetes, etc.

5.3.2 APPLICATION CHARCTERISTICS

S No.	Characteristics	Description	Technology
1.	Open-Source Frameworks	Google Collab	Python
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 –	Technology used

		tier, Microservices)	
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc	Technology used

5.4 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release

Customer	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN – 3	As a user, I can register for the application through Gmail		Medium	Sprint-1

	Login	USN – 4	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN – 5	As a user, I can enter my sales data to clean and prepare it for analysis		High	Sprint-2
		USN – 6	As a user, I can identify trends in the data and make visualisations			Sprint-2
		USN - 7	As a user, I can conduct business analysis to make business decisions			Sprint-2

Customer care Executive		USN – 8	As a Customer Care Executive, I can answer users' queries		High	Sprint-3
Administrator		USN - 9	As an admin, I can make changes to the interface according the needs		High	Sprint-4

PROJECT PLANNING & SCHEDULING

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Title	Description	Date
Literature Survey and Information Gathering	Gathering Information by referring the technical papers, research publications etc	2 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	25 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	8 October 2022
Functional Requirement	Prepare functional Requirement	14 0ctober 2022
Data flow Diagrams	Data flow diagram	14 0ctober 2022

Technology Architecture	Technology Architecture diagram	16 0ctober 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

6.2 SPRINT DELIVERY SCCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	user can register for the application by entering my email and password	1	high	KISHORE. M. L
Sprint-1	Registration	USN-2	User will receive email if the registration is successful. That the registration has conformed	1	high	KISHORE. M. L
Sprint-2	Registration	USN-3	As a user, I can register by any browser	2	low	PRAVEEN JEFFRI
Sprint-1	Data extract	USN-4	As a user, I can extract data	1	medium	PRAVEEN RAJ

Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	**2**	high	PRAVEEN RAJ
Sprint-2	Dashboard	USN-6	I can access the dashboard of mine.	**1**	medium	KAMALE SH KANNA
Sprint-1	Activity	USN-7	I can register for the application through any web browser	**1**	low	PRAVEEN JEFFRI
Sprint-1	Access resources	USN-8	I can use my credentials For accessing my resources.	**1**	high	PRAVEEN RAJ
Sprint-2	Set events	USN-9	As, a user I can schedule events and set events.	**1**	high	KISHORE. M. L
Sprint-3	Tools	USN-10	I can perform analysis by tools(cognos and with ML)	**1**	high	KISHORE. M. L

DATA VISUALIZATION CHARTS AND RESULTS

CHAPTER 7

DATA VISUALIZATION CHARTS AND RESULTS
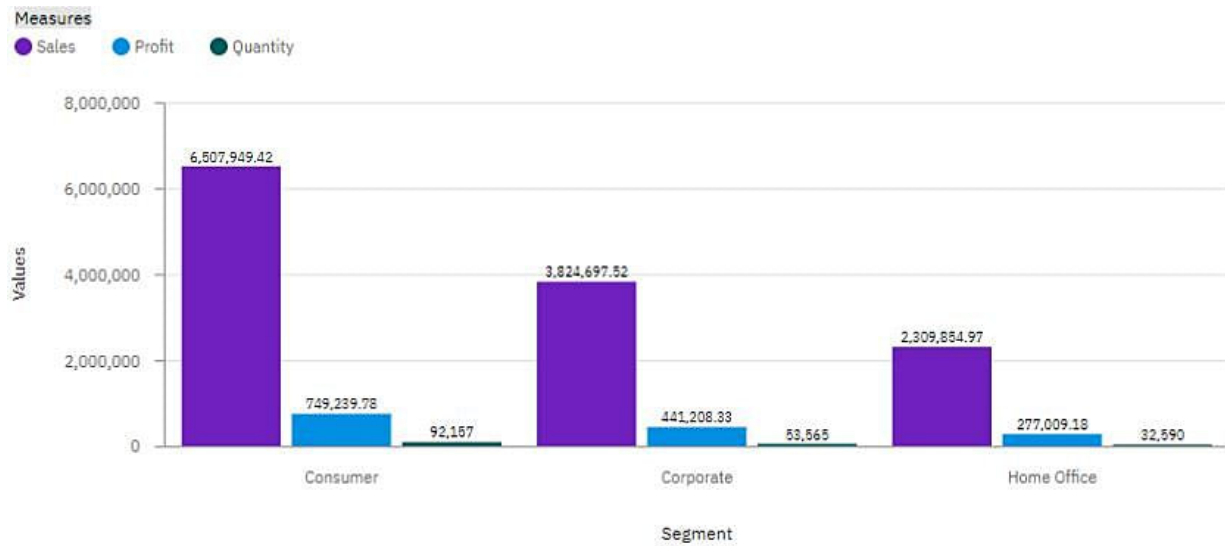
7.1 DATA VISUALIZATION CHARTS

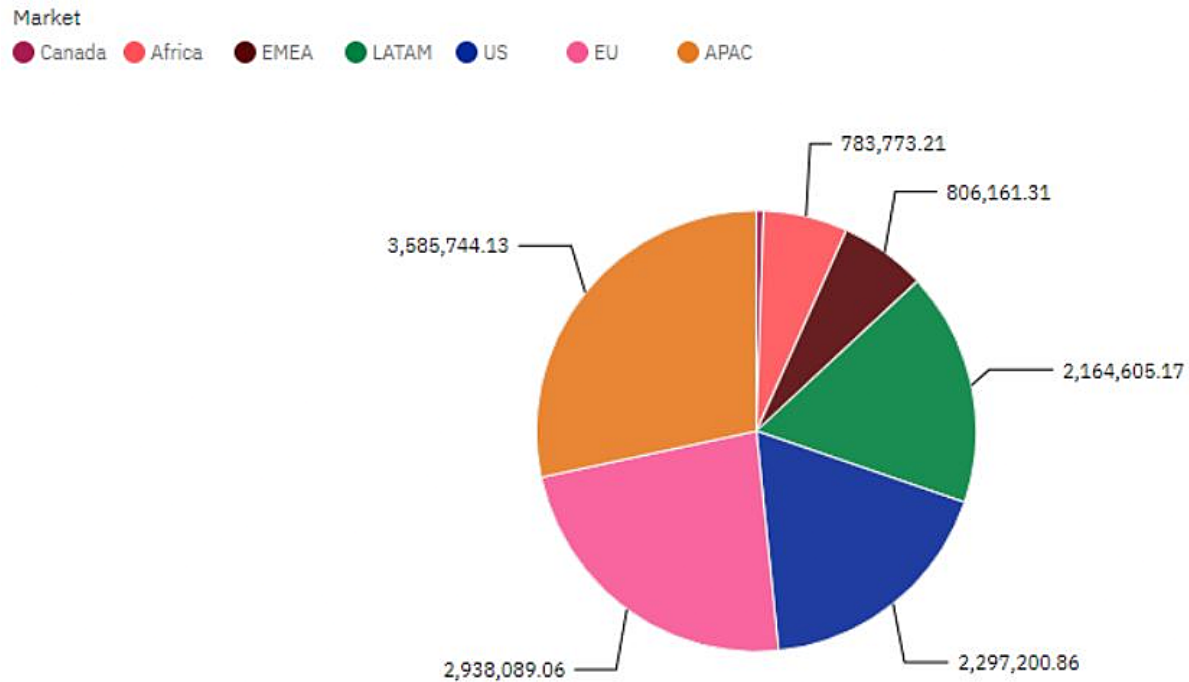Figure 7.1 Segment-wise Sales, Profit and Quantity

Figure 7.2 Sales by Market

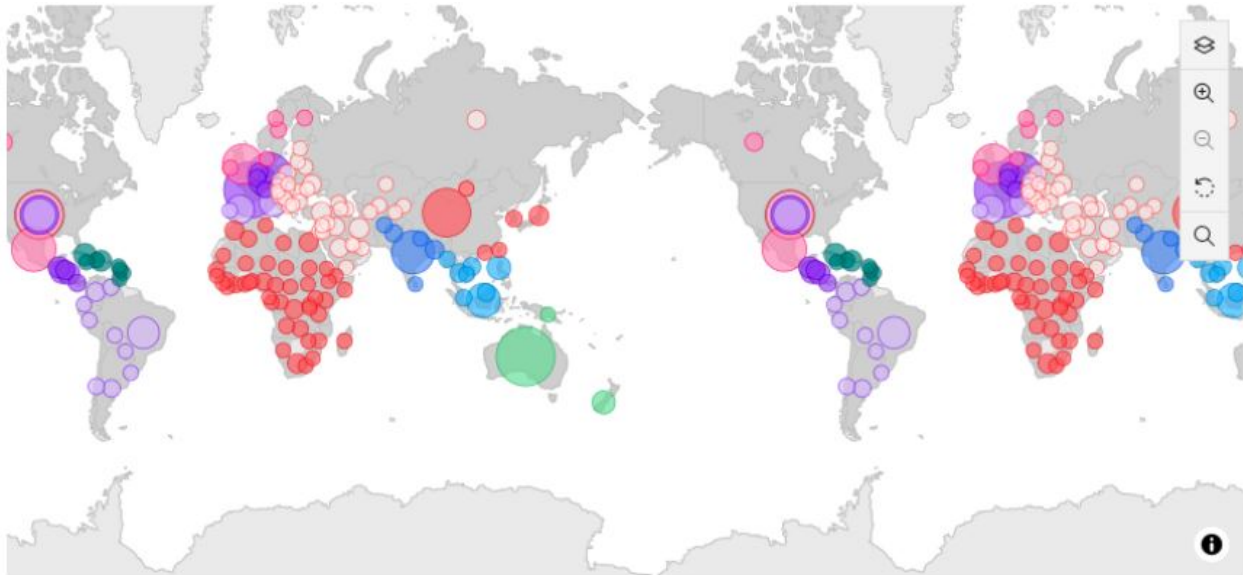Figure 7.3 Sales by Sub-Category and Sales by Region
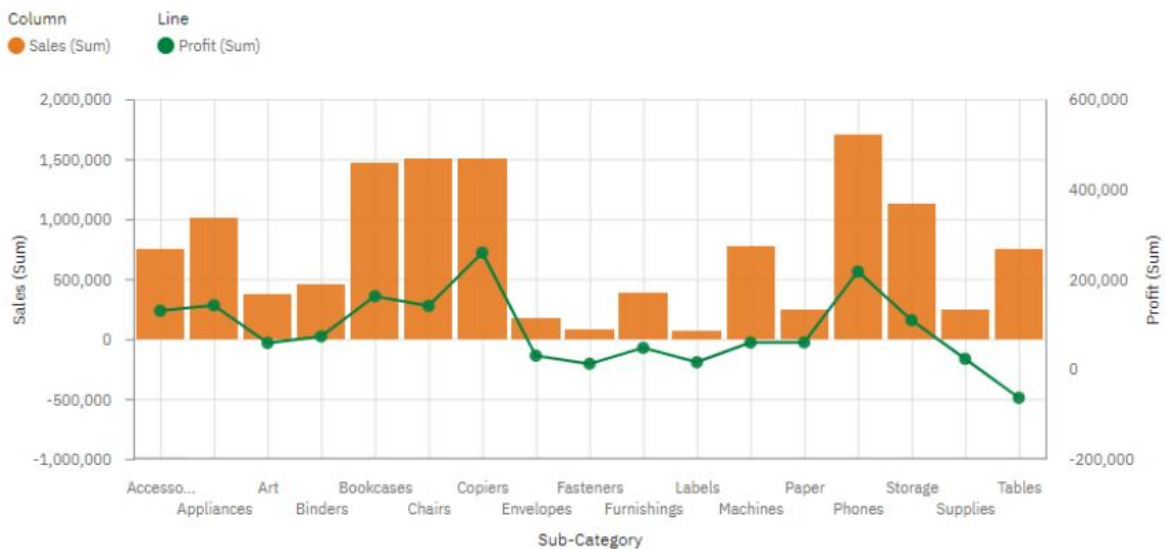
Figure 7.4 Country-wise Sales using map points

Figure 7.5 Sub-Category-wise sales and Profits using Line and Bar Chart
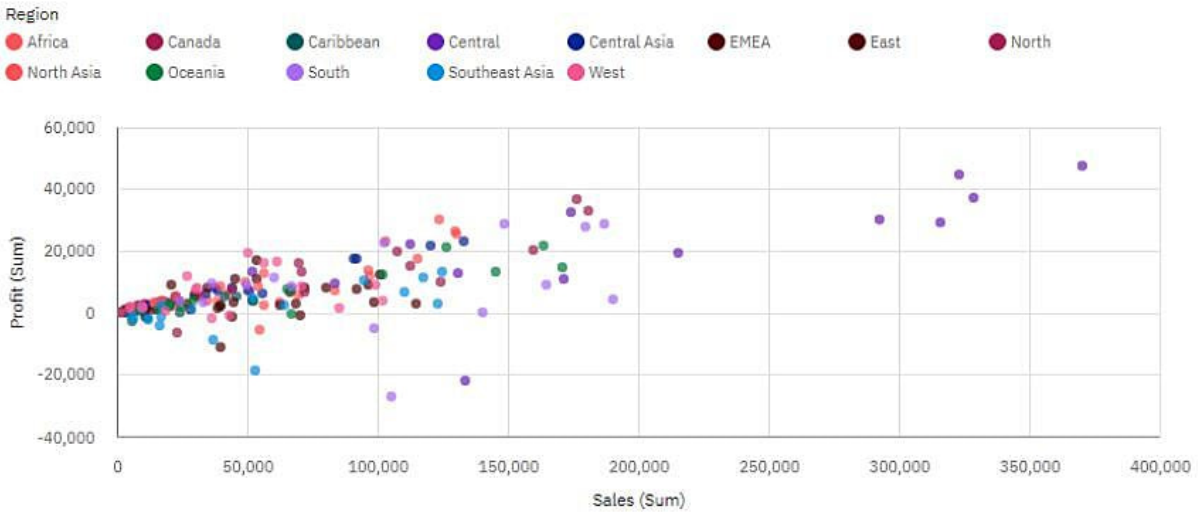
Figure 7.6 Sales Vs Profit Scatter plot with Sub-Categories and Regions
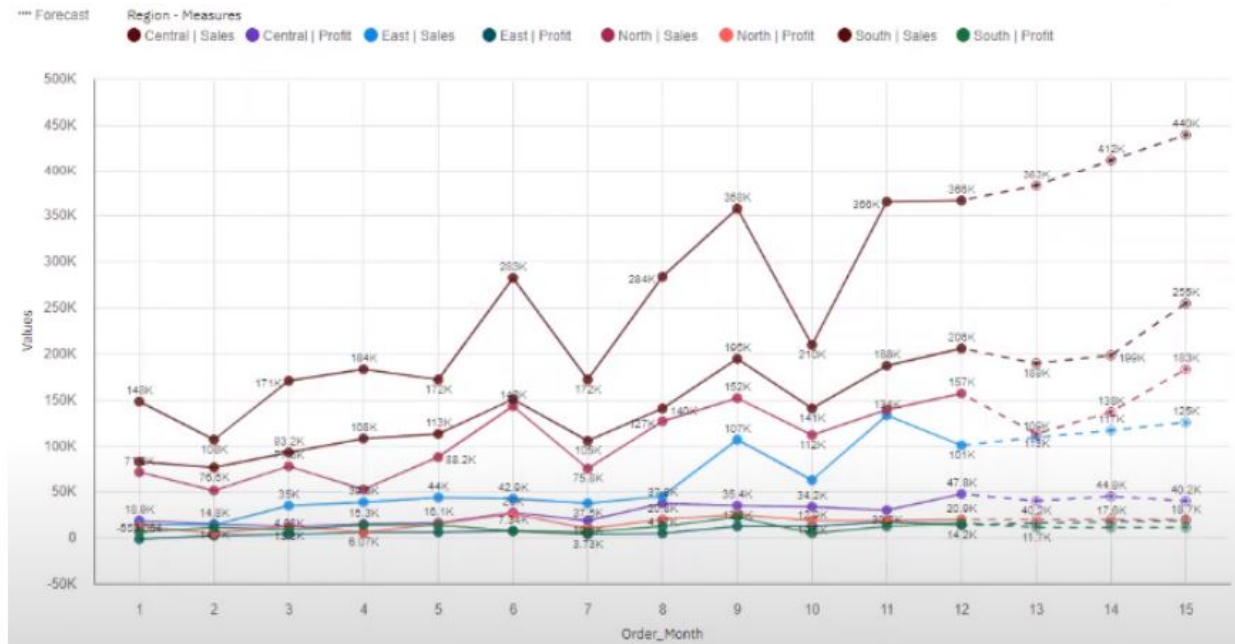

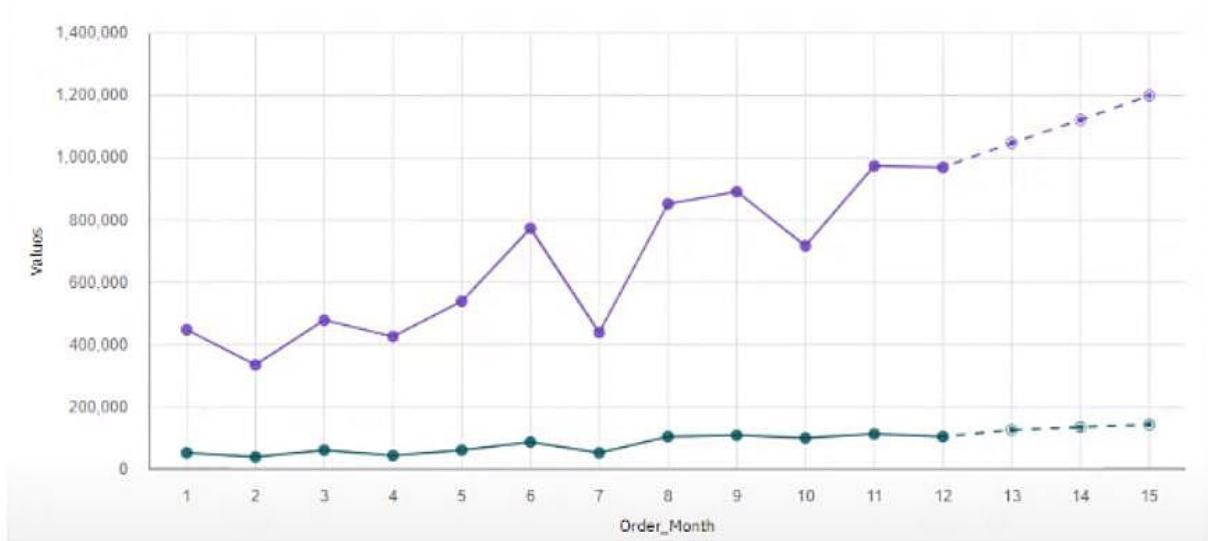Figure 7.7 Regional Sales and Profit Forecast

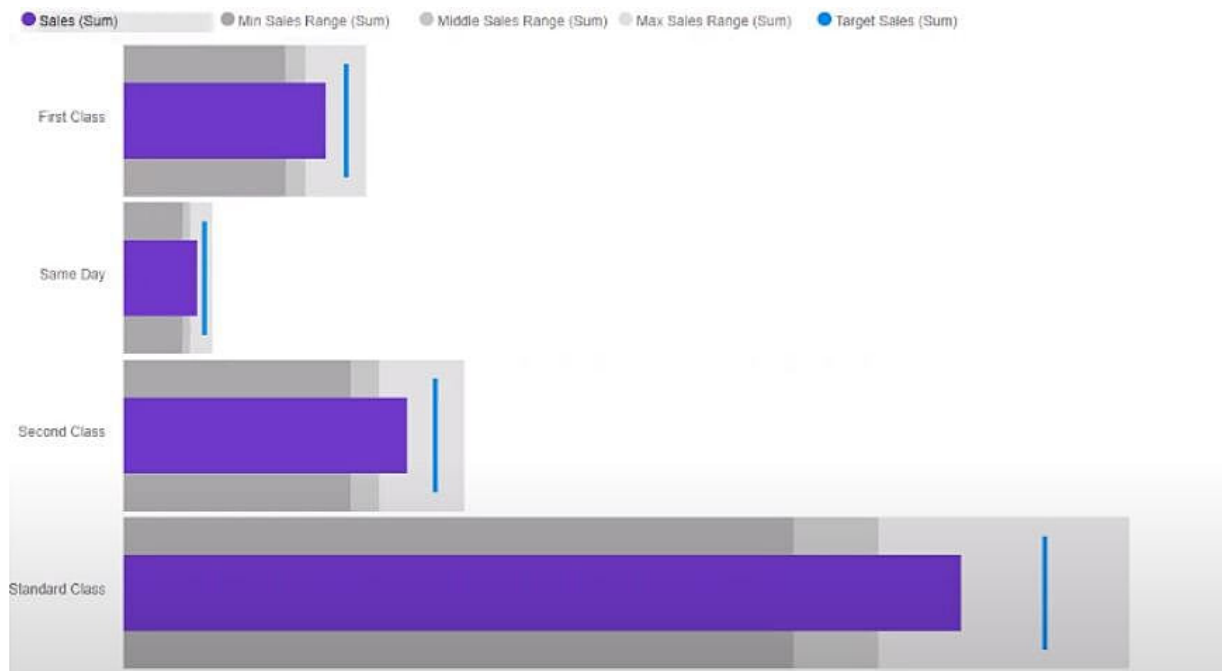Figure 7.8 Sales Forecast by Order Priority
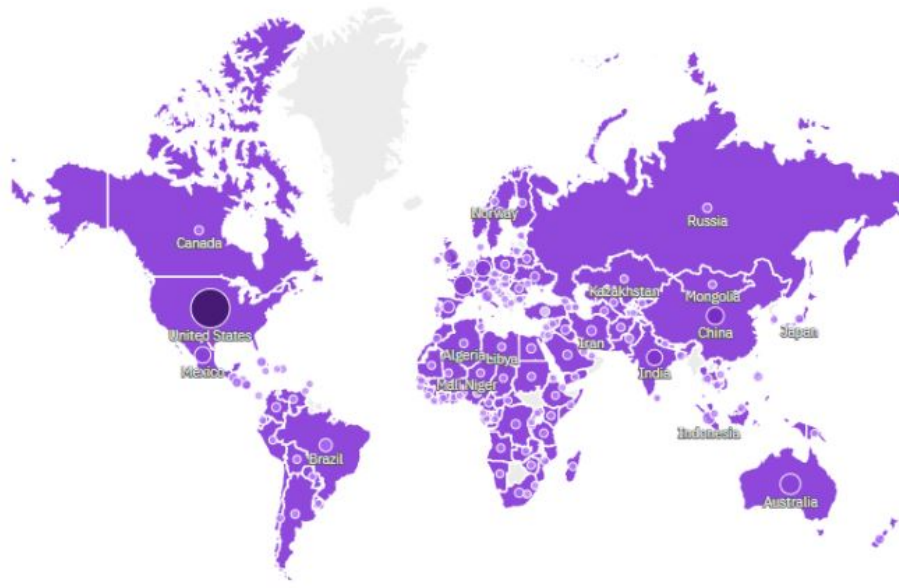

Figure 7.9 Sales by Segment Analysis

Figure 7.10 Regional Quantity and Sales using Radar Chart
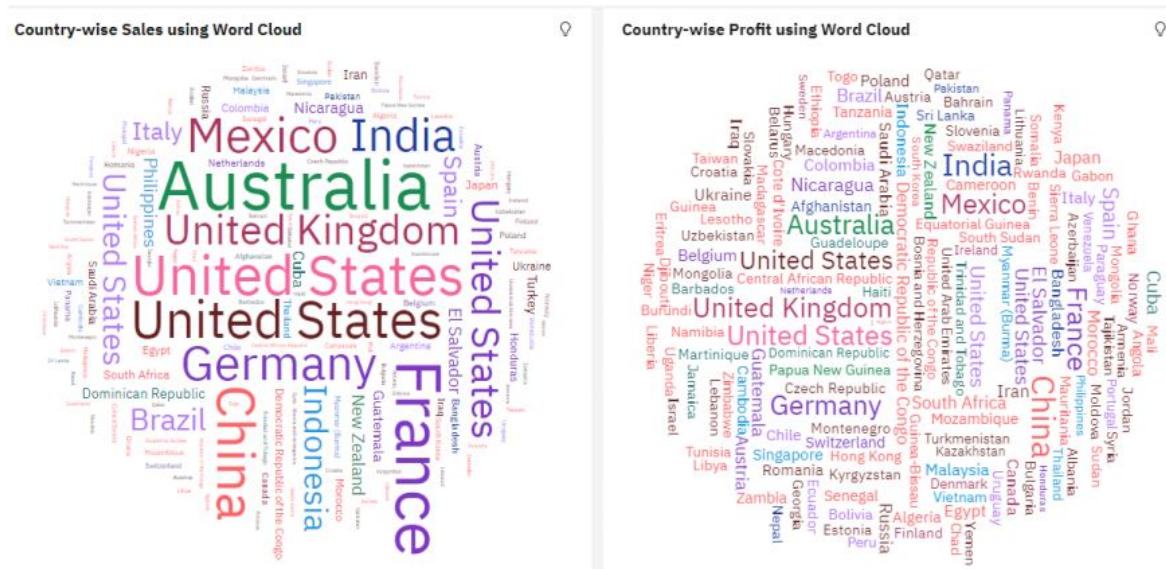

Figure 7.11 Country-wise Sales Vs Profit Word Cloud

7.2 RESULTS

TOP SALES BY COUNTRY AND FILTERED BY REGION

Figure 7.11 Sales by country and filtered region

SHIP MODE AND SALES

Figure 7.12 Ship Mode and Sales

- Most customers prefer the standard class shipping mode
- Standard Class shipping mode has the most profit

- Maximum sold items are shipped through Standard Class
- Same day delivery is least preferred shipping mode
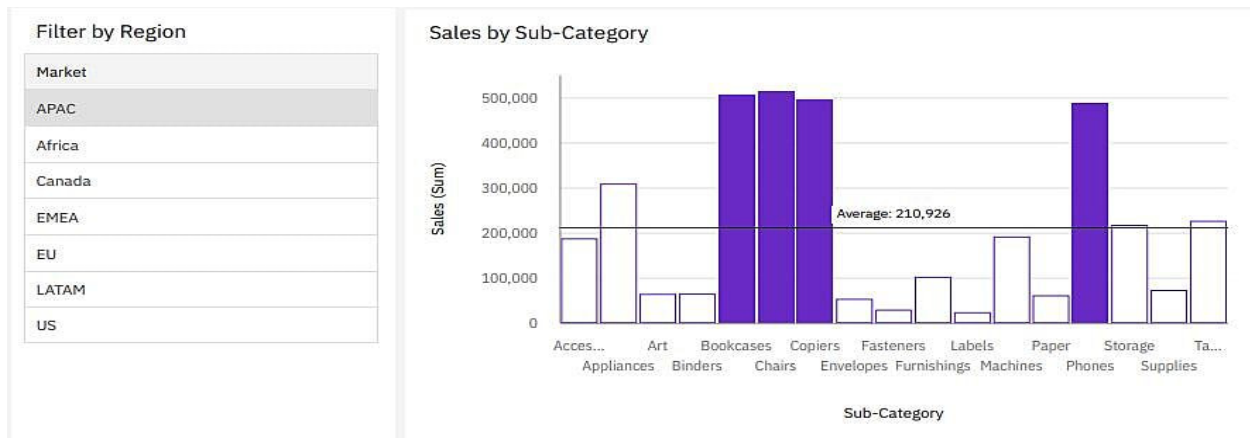
SALES BY SUB-CATEGORY

Figure 7.13 Sales by Sub-Category

DISCOUNT, PROFIT AND SALES
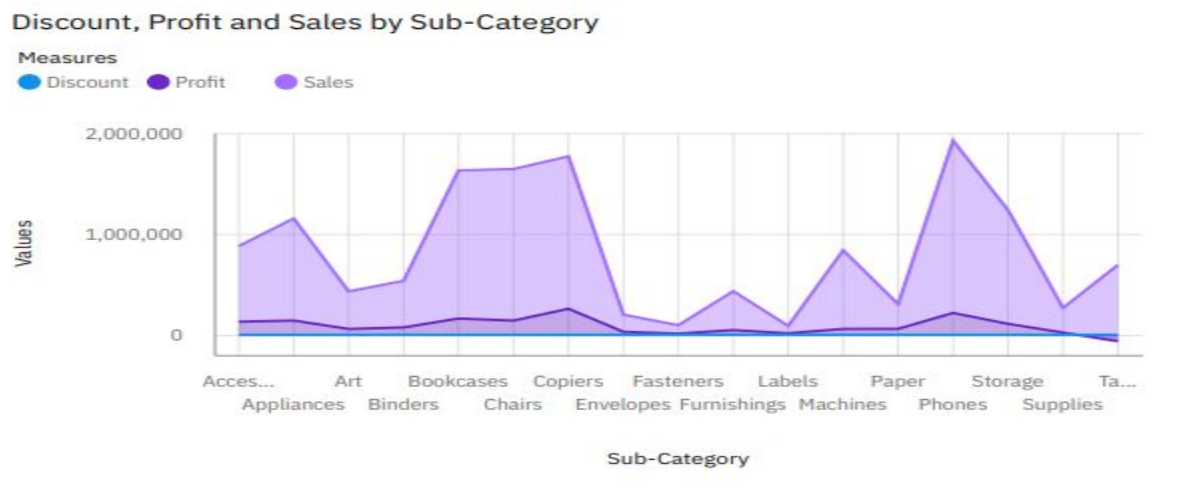
Figure 7.14 Discount, Profit and sales

- Profit is almost directly proportional to sales and discount
- combined
- More the sales and discount combined; more is the profit for

- that subcategory of products

SALES AND PROFIT ANALYSIS OVER PAST YEARS

Figure 7.15 Sales and Profit analysis over Past Years

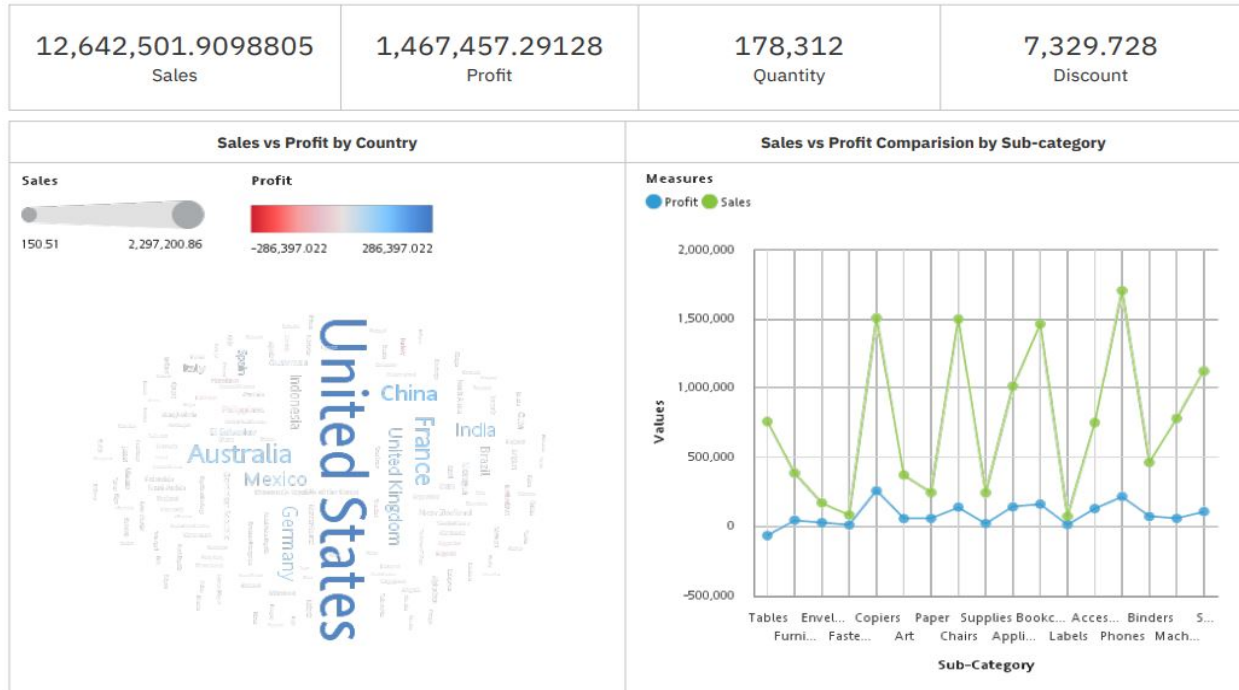## GLOBAL SUPERSTORE DATA ANALYSIS – REPORT

Figure 7.16 Global Super store data analysis - Report

ADVANTAGES AND DISADVANTAGES

CHAPTER 8

ADVANTAGES AND DISADVANTAGES

8.1 ADAVANTAGES

- A close review of each stage can help optimize each part of the process by making minor improvements. Sales analytics can also help automate some processes, such as prospecting, and give sales representatives the opportunity to focus only on closing sales.

- Marketing teams and sales representatives can review each stage of the process and its success individually.

- Using sales analytics helps to optimize the sales funnel and make improvements to the sales process, which leads to efficiency.

- Sales trends can help predict revenue and inform marketing departments of which techniques are effective among certain demographics in the business's target audience.

- Product sales analysis reviews all the products a business has on the market. It's important to track each product and focus on the products that are performing best.

- This is an intuitive analytic and can be a great resource for representatives by

providing data on prospects and customers to help make and repeat sales.

8.2 DISADVANTAGES

- This may breach privacy of the customers as their information such as purchases, online transactions, subscriptions are visible to their parent companies. The companies may exchange these useful customer databases for their mutual benefits.

- The cost of data analytics tools varies based on applications and features supported. Moreover, some of the data analytics tools are complex to use and require training. This increases cost to the company willing to adopt data analytics tools or software.

- The information obtained using data analytics can also be misused against group of people of certain country or community or caste.

- It is very difficult to select the right data analytics tools. This is due to the fact that it requires knowledge of the tools and their accuracy in analyzing the relevant data as per applications. This increases time and cost to the company.

CONCLUSION

CHAPTER 9

CONCLUSION

It is concluded that brief study on data visualization, it is clear that the field is rich in potential applications in diverse disciplines, at the same time we need to be aware of its practical and ethical complexities. In the previous chapters, this project presents some important theoretical and practical principles to keep in mind when designing a data visualization. We have also discussed and critiqued several examples of data visualizations, learning common pitfalls and helpful tricks along the way. As we have seen, developing an effective and ethical data visualization is a complex process. In this chapter we will touch upon the future of data visualization and additional resources for data visualizers. With the right data, sales success is far more achievable and, importantly, measurable. Sales data is enormously powerful and it's something you come by just by tracking your activities effectively. Knowing how to fully utilize it will revolutionize your sales process, leading to better lead generation, client engagement and retention and, ultimately, more sales.

FUTURE SCOPE

CHAPTER 10

FUTURE SCOPE

Data analytics has a bright future ahead as it has more potential, which everyone can explore. There is no shortage of opportunities for those who want to explore this field and move forward with their career in this competitive market world. Today, data analytics is being used in many fields such as healthcare, retail, transportation, manufacturing, and many others. However, there are certain areas where it can be used more effectively. Data analytics is expected to radically change the way we live and do business in the future. Already today we use the analytics in our technology devices, for many decisions in our lives. Changing technological landscape and newer business challenges compel companies today to look for strategies that ensure higher business returns as well as reduced operational expenses. Companies may have large measures of data in every single area of research, showcasing, deals, creation customer service and so on. They need to standardize data storage and security arrangements, to align their operational structure with industry requirements. The future of Data Analytics looks bright as a career and a subject for research.