Global Sales Data Analytics

1.Introduction

1.1 Project Overview

The main idea of this design is to make a deal pattern analysis and client analysis which would be leading to more accurate soothsaying and proportions. The deals pattern analysis focuses on changing trends within deals data, which can help you understand your product demand. The thing about client analytics is to produce a single, accurate view of an association's client base, which can inform opinions about how to stylishly acquire and retain unborn guests. It can also identify high-value guests and suggest visionary ways to interact with them. The epidemic has accelerated the shift towards a further digital world and touched off changes in online shopping actions that are likely to have lasting goods. An intriguing side effect was how snappily brand fidelity fell by the wayside. In fact, 40 of consumers said they switched brands during the epidemic, according to McKinsey & Company exploration. So, it's important to allow business owners to decide value from data and make informed opinions. Data analytics in e-commerce not only helps company possessors understand their guests but also reads consumer test patterns and increases profit.

1.2 Purpose

Through this design, companies identify their most and least performant products, cover buyer and consumer behavior, and determine which issues impact the business.

And also used bye-commerce professionals to ameliorate both deals and the client experience, but can also be used by directors for fulfillment and by accountants to track costs and profitability.

2. Literature Survey

2.1 Existing problem

India will rank first in terms of e-commerce development with a compound annual growth rate (CAGR) of 17.8 in the following projected period from 2019 to 2023. Online shopping is one of the most popular internet activities - with some product categories being more popular than others. Customers nowadays are always in search of innovative products. Innovation can be either in product, place, promotion, or even price. Now it’s easier to enter a new market and one can evaluate his/her product and company’s performance.

2.2 References

The customer data platform market is steadily rising from USD 2.4 billion in 2020 to USD 10.3 billion in 2025. Parallelly, businesses focusing on customer experience enjoy an 80% revenue spike. Up to 84% of online store customers said eCommerce customer service is one of the key factors influencing purchasing decisions. Customer information gathered via post-checkout surveys can improve customer service and create more helpful FAQ pages, newsletters, and communication. While forecasting demand, customer data is used to predict potential interest in products or services. This can significantly help you lower your operating costs (in particular storage costs) and improve the efficiency of your online store. After acquiring Goodreads in 2013, Amazon

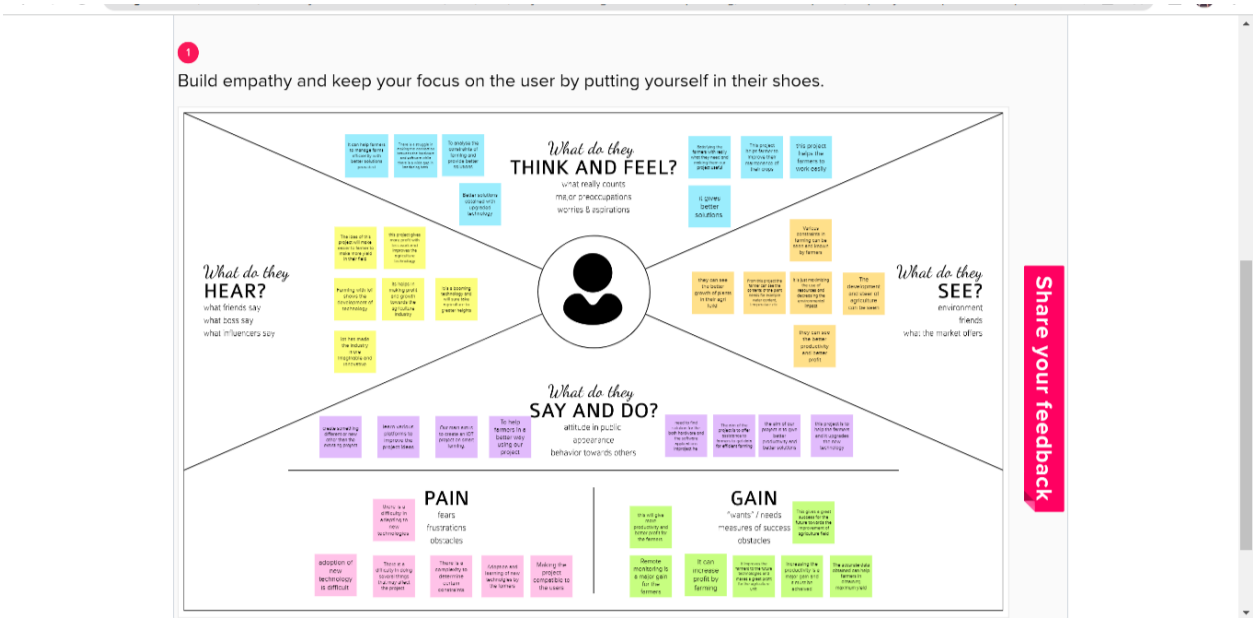
integrated the social networking service of roughly 25 million users with some Kindle functions. This enabled the users to highlight words and notes and also to share them among their peers as a means to discuss the book. The company benefited from this in a way that it could regularly monitor the highlighted words in Kindle to know about the interest of the readers. They further used this data to recommend books to their customers and also to enhance the reading experience.

2.3 Problem statement definition

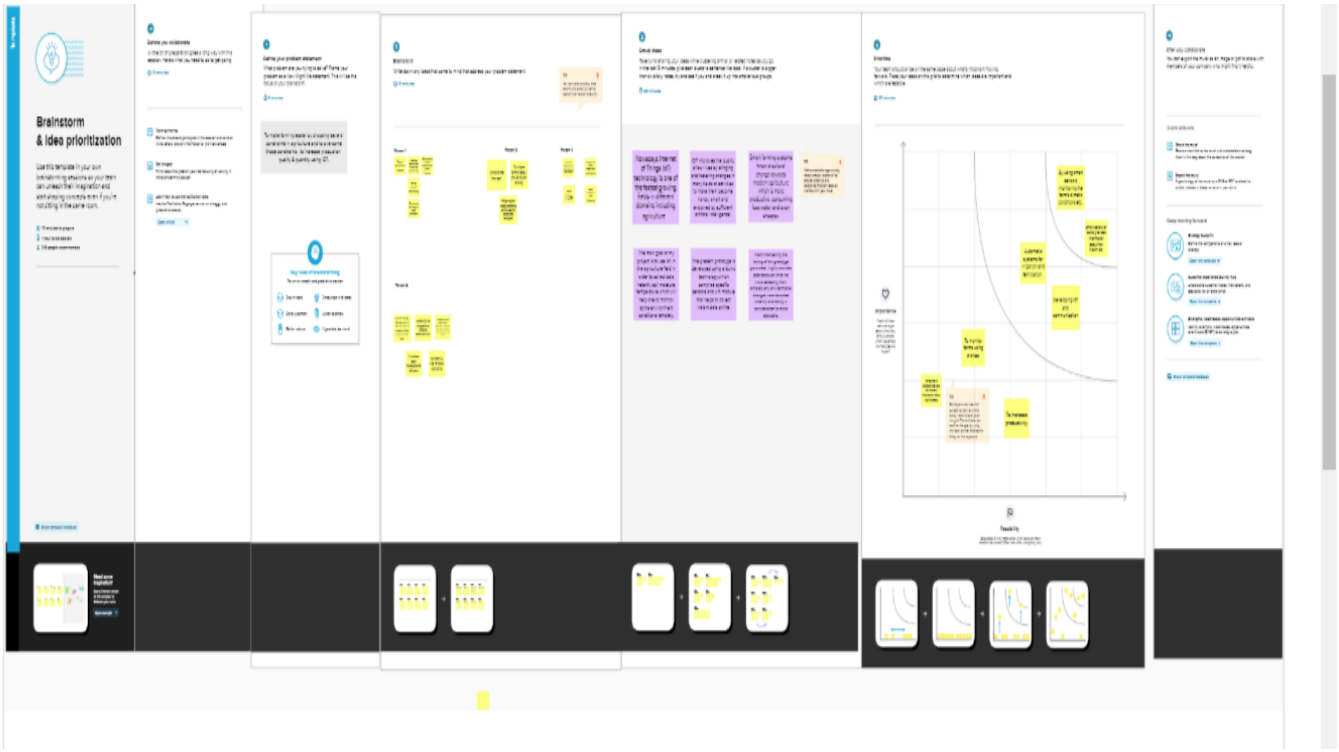
Lack of knowledge and specialized profiles, already in place organizations and technological architectures mostly designed for traditional BI projects, data volumes and variety are not the ones companies are used to manage, real-time data streaming is a brand topic for many.
All these challenges are mainly technical but probably the most important one to address is the ability to identify which is the business driver that directly impacts the business's income statement, increasing revenues and reducing costs. The most effective way to sell a Data Science project to the business is by demonstrating what kind of business problems it will solve and which will be the impact on company results.

3. Ideation and Proposed Solution

3.1 Empathy Map Canvas



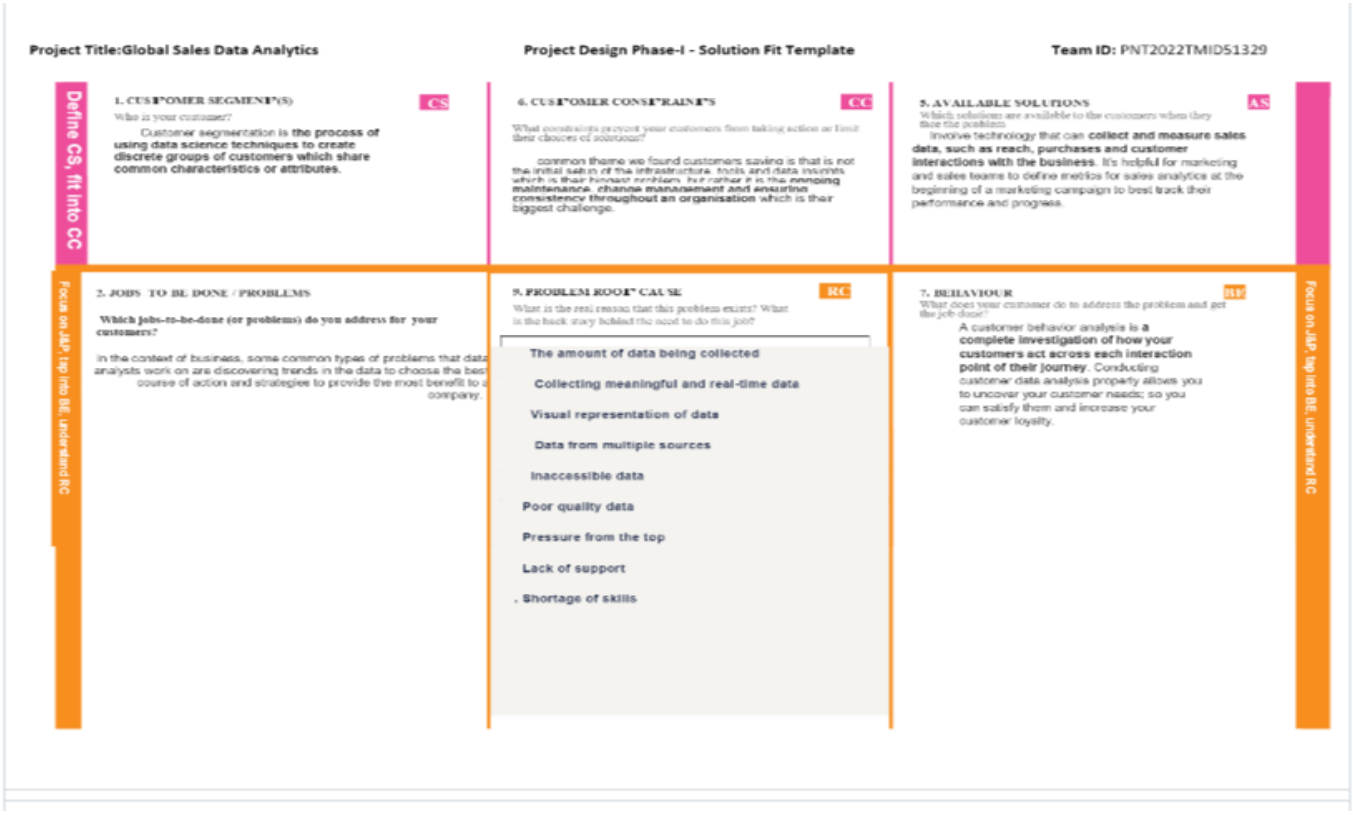
3.2 Ideation & Brainstorming



3.3 Proposed solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The main objective of this project is to make a sales pattern analysis and customer analysis which would be leading to more accurate forecasting and quotas.
2.	Idea / Solution description	The sales pattern analysis focuses on finding trends within sales data, which can help you better understand your product demand.
3.	Novelty / Uniqueness	By the customer analytics, create a single, accurate view of an organization's customer base, which can inform decisions about how to best acquire and retain future customers.
4.	Social Impact / Customer Satisfaction	It can identify high-value customers and suggest proactive ways to interact with them.
5.	Business Model (Revenue Model)	Creating dashboard and cloud storage
6.	Scalability of the Solution	E-commerce website

3.4 Problem solution fit



Project Title:Global Sales Data Analytics

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMID51329

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?

Customer segmentation is **the process of using data science techniques to create discrete groups of customers which share common characteristics or attributes.**

6. CUSTOMER CONSTRAINTS CC

What constraints prevent your customers from taking action or limit their choices of solutions?

common theme we found customers saying is that is not the initial setup of the infrastructure, tools and data insights which is their biggest problem, but rather it is the **ongoing maintenance, change management and ensuring consistency throughout an organisation** which is their biggest challenge.

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face the problem

Innovate technology that can **collect and measure sales data, such as reach, purchases and customer interactions with the business**. It's helpful for marketing and sales teams to define metrics for sales analytics at the beginning of a marketing campaign to best track their performance and progress.

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

2. JOBS TO BE DONE / PROBLEMS

Which jobs-to-be-done (or problems) do you address for your customers?

In the context of business, some common types of problems that data analysts work on are discovering trends in the data to choose the best course of action and strategies to provide the most benefit to a company.

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?

- **The amount of data being collected**
- **Collecting meaningful and real-time data**
- **Visual representation of data**
- **Data from multiple sources**
- **Inaccessible data**
- **Poor quality data**
- **Pressure from the top**
- **Lack of support**
- **. Shortage of skills**

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job done?

A customer behavior analysis is **a complete investigation of how your customers act across each interaction point of their journey**. Conducting customer data analysis properly allows you to uncover your customer needs; so you can satisfy them and increase your customer loyalty.

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

3. TRIGGERS

TR

What triggers customers to act?

Trigger analytics is a great tool to enable marketing to reach out to the customer

4. EMOTIONS: BEFORE / AFTER

EM

How do customers feel when they face a problem or a job and afterwards?

Before: The user felt insecure to use internet and doubtful about their privacy.

After: collects data on how a person communicates verbally and non verbally to understand the person mood or attitude

10. YOUR SOLUTION

Our solution is to manage the complexity of your data and transform existing systems into a next generation data platform.consolidate monitoring and drive exponential value with a self service console to consume,manage,and optimize data and analytics .implement AI at scale and create your end to end data supply chain for seamless data processing and analysis.

8. CHANNELS of BEHAVIOUR

CH

8.1 ONLINE

What kind of actions do customers take online?

A customer analytics tool helps organization make sense of their collected data and can display trends in the form of charts and graphs

8.2 OFFLINE

What kind of actions do customers take offline?

If your ecommerce marketing team isn't already ingesting offline purchase data its time to get those feeds in place.because once you do have that data handby there are several steps you can take to elevate your ecommerce marketing efforts.

4. Requirement Analysis

4.1 Functional Requirements

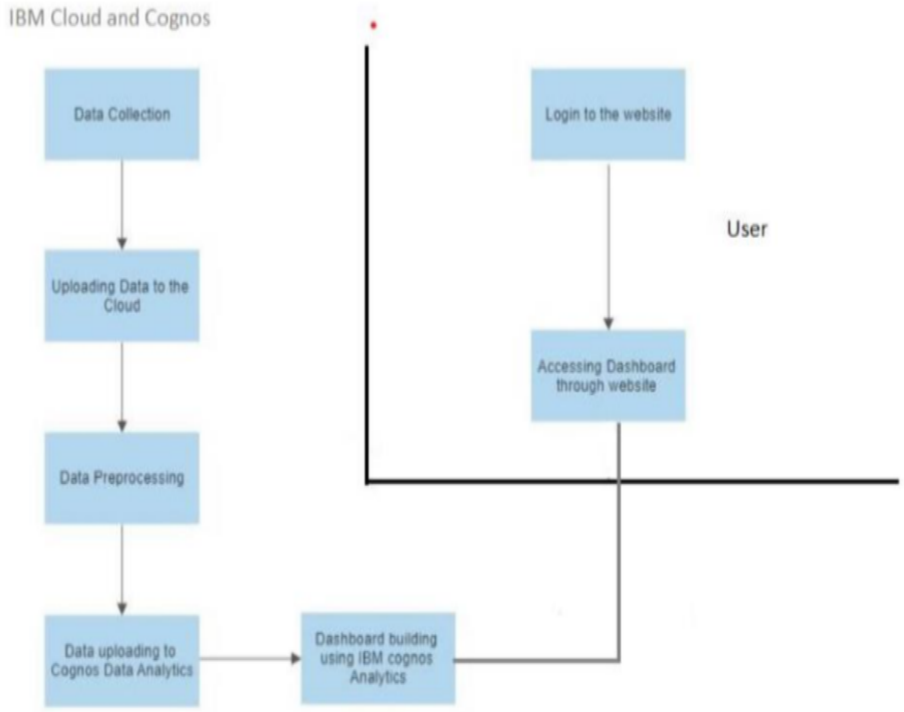
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Email or Form
FR-2	User Confirmation	Confirmation via Email
FR-3	User Input	Data must be uploaded in the suggested format
FR-4	Data Preprocessing	Data must be cleaned and verified for outliers, null values, and duplicates
FR-5	Data Visualization	Meaningful Charts and graphs must be chosen which are most insightful
FR-6	Dashboard	To display the result of analysis

4.2 Non-functional Requirements

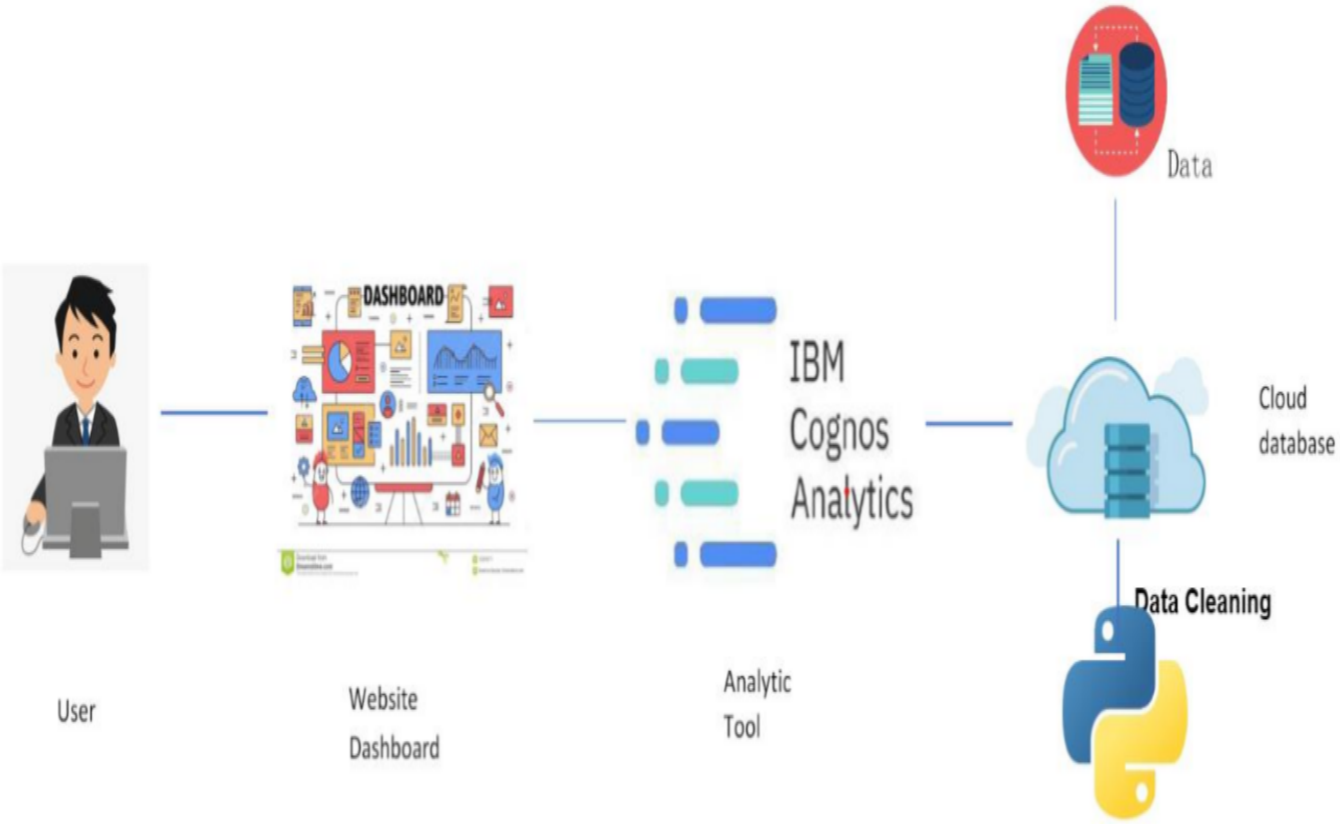
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system must be easy to use, until the dashboard contains proper sales datasets, the user can use it
NFR-2	**Security**	The dashboards are only accessible with appropriate login credentials
NFR-3	**Reliability**	User dashboards must be available anytime without crashing
NFR-4	**Performance**	The performance and efficiency of the dashboard should be very high
NFR-5	**Availability**	Our model must be made available to access with any compatible web browsers and devices
NFR-6	**Scalability**	Dashboard must be quite flexible and should be easily adopted easily by any E-commerce business

5. Project Design

5.1 Data-Flow Diagrams



5.2 Solution & Technical Architecture



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task
Analytic Team	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.
		USN-2	As a user, I will receive confirmation email once I have registered for the application
		USN-3	As a user, I can register for the application through Email
	Login	USN-4	As a user, I can log into the application by entering email & password
	IBM Cognos Analytics	USN-5	As a user, I can enter my sales data to clean and prepare it for analysis
		USN-6	As a user, I can identify trends in the data and make visualizations to create dashboard for customers
Customer	Website	USN-7	As a user, I can visit the website to get sales insights

6. Project planning & scheduling

6.1 Sprint planning & Estimation

Sprint	Functional Requirement	User Story Number	User Story /Task	Story Points	Priority
Sprint-1	Registration	USN-1	As a user, I can register for the website by entering my email, and password, and confirming my password.	2	High
Sprint-1		USN-2	As a user, I will receive a confirmation email once I have registered for the application	2	High

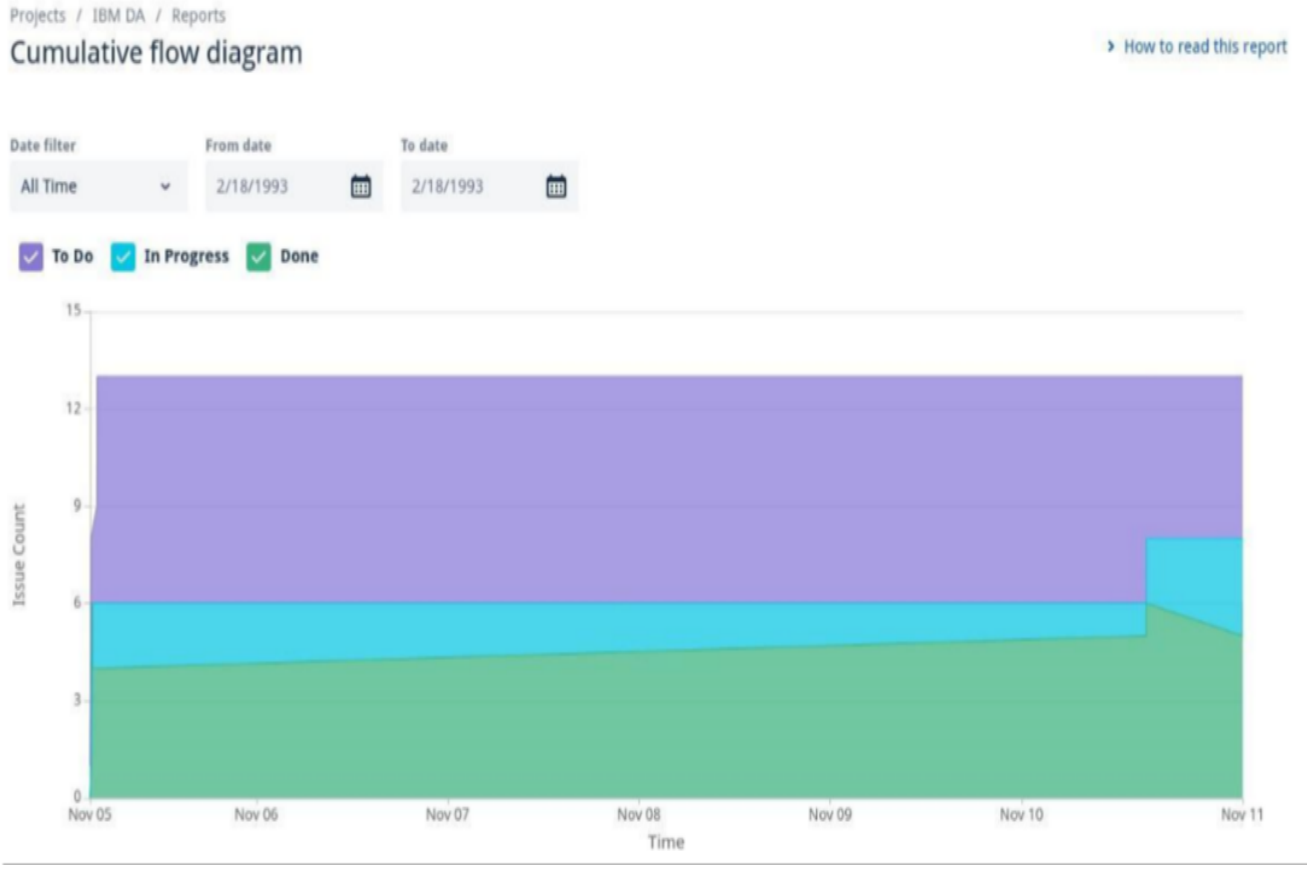
Sprint-1		USN-3	As a user, I can register for the application through Email	2	Medium
Sprint-1	Login	USN - 4	As a user, I can log into the application by entering email and password	2	High
Sprint-2	IBM Cognos Analytics	USN-5	As a user, I can enter sales data to clean and prepare it for analysis	13	High
Sprint-3		USN-6	As a user, I can identify trends in data by making visualization to create dashboard that gives sales insights	16	High
Sprint-4	Website	USN-7	As a user, I can visit the website to get sales insights	10	Medium

6.2 Sprint Delivery Schedule

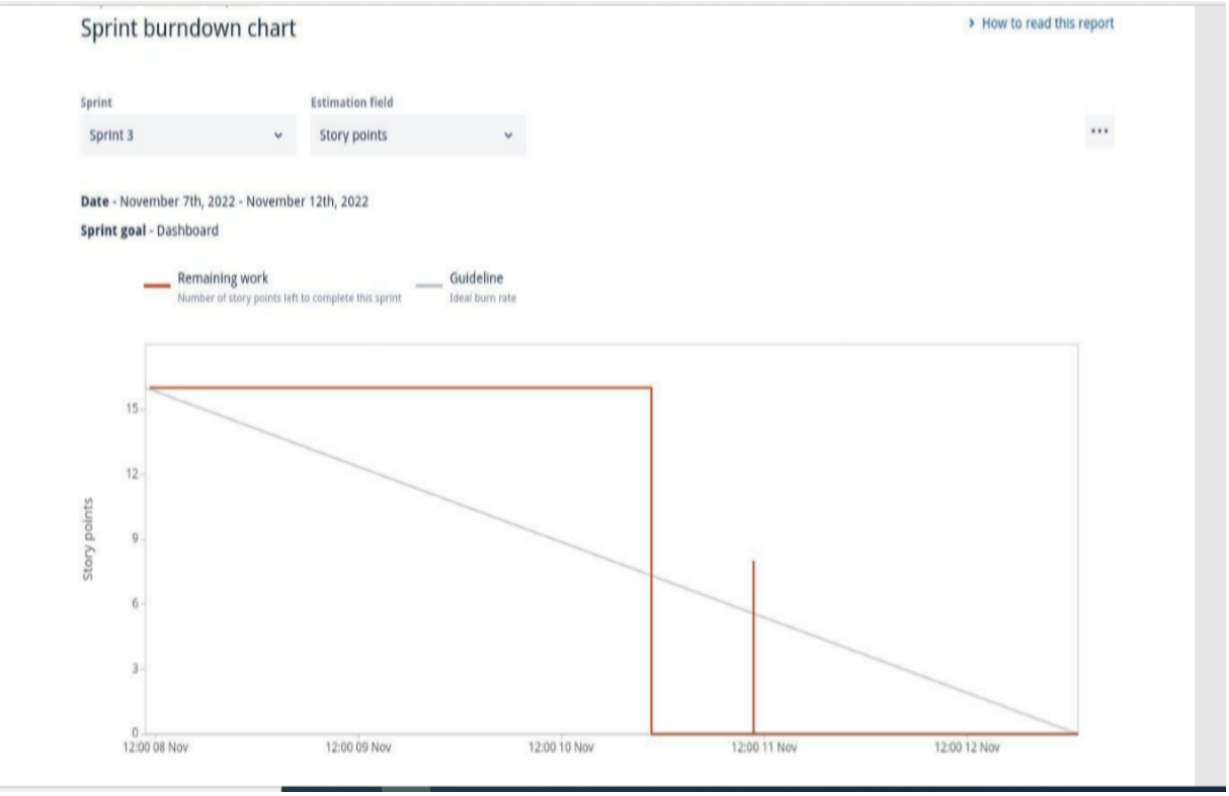
Sprint	Story Points	Duration	Sprint Start Date	Sprint End Date
Sprint-1	8	6 Days	24 Oct 2022	29 Oct 2022
Sprint-2	13	6 Days	31 Oct 2022	05 Nov 2022
Sprint-3	16	6 Days	07 Nov 2022	12 Nov 2022
Sprint-4	10	6 Days	14 Nov 2022	19 Nov 2022

6.3 Reports from JIRA

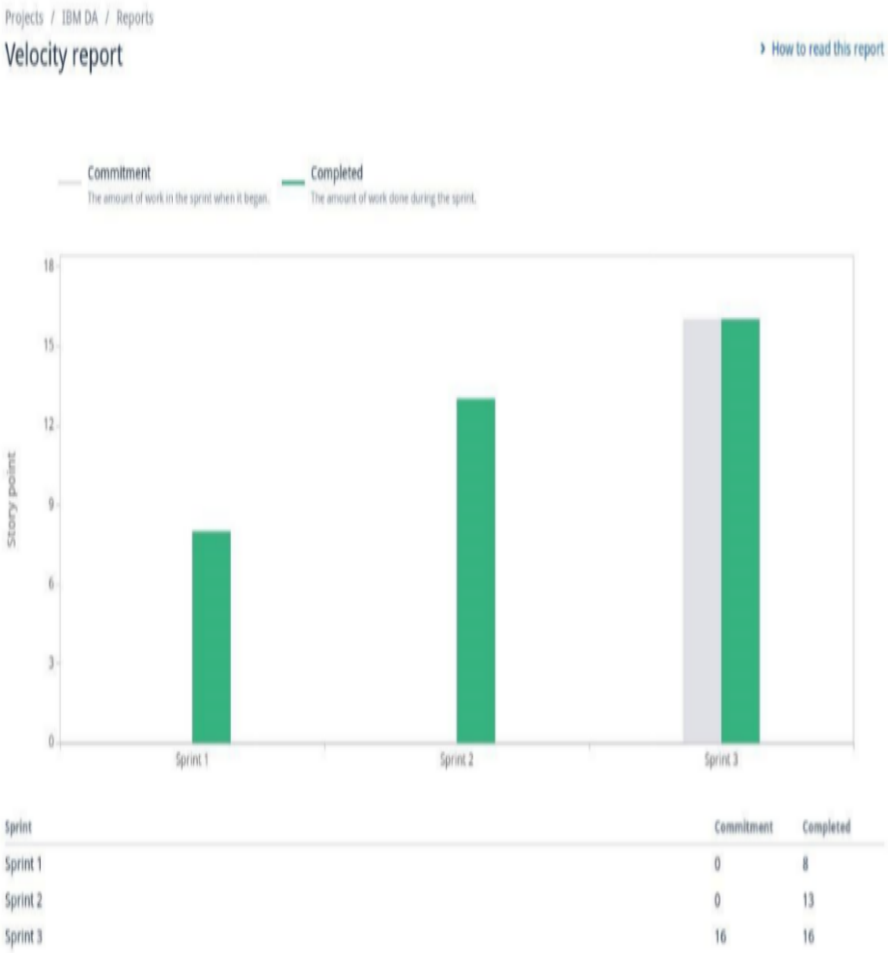
a. Cumulative flow diagram



b. Sprint burndown chart



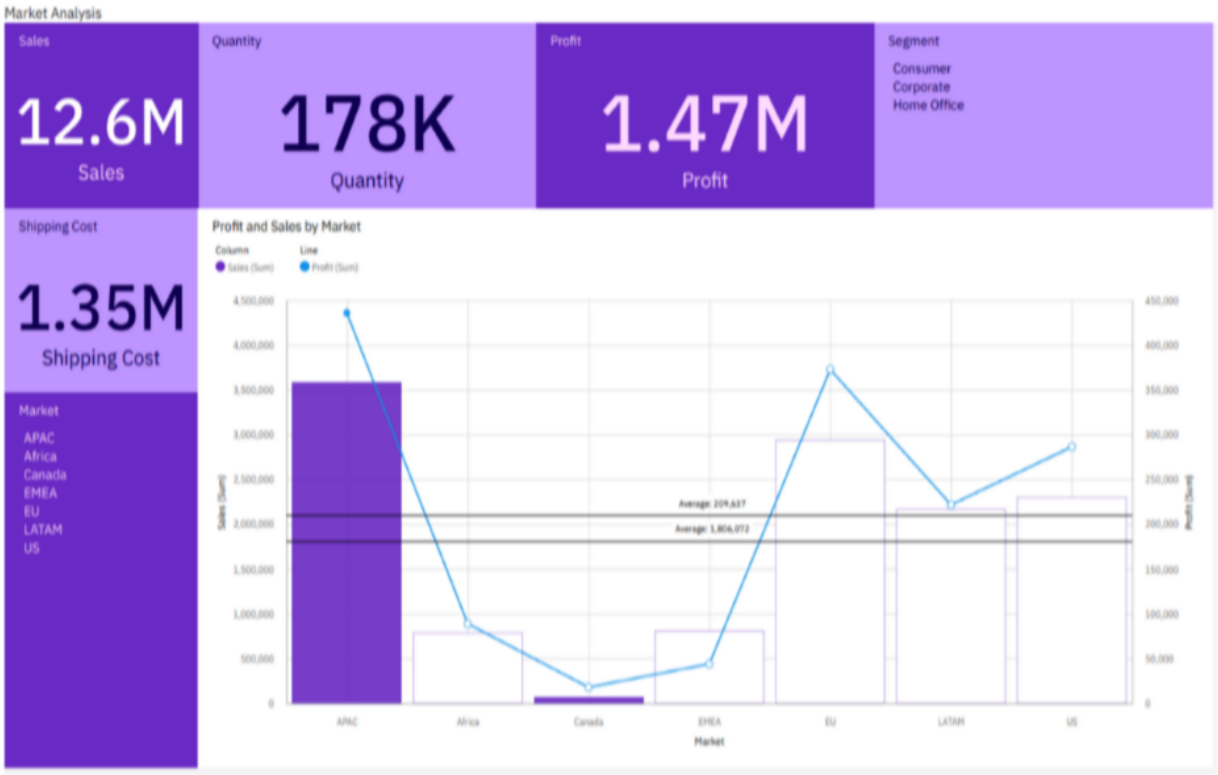
c. Velocity report



Sprint	Commitment	Completed
Sprint 1	0	8
Sprint 2	0	13
Sprint 3	16	16

7. Coding & Solutioning

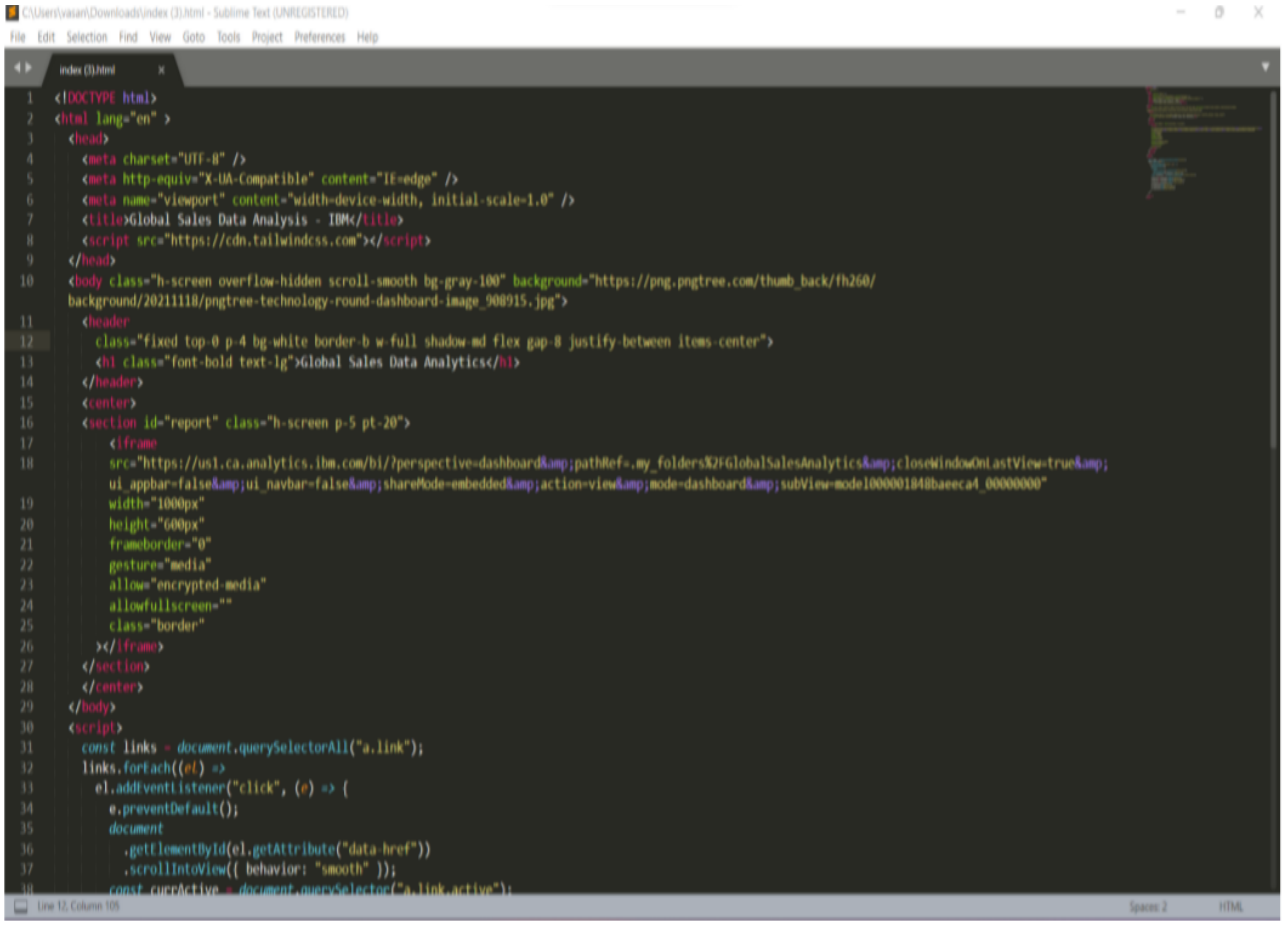
7.1 Dashboard



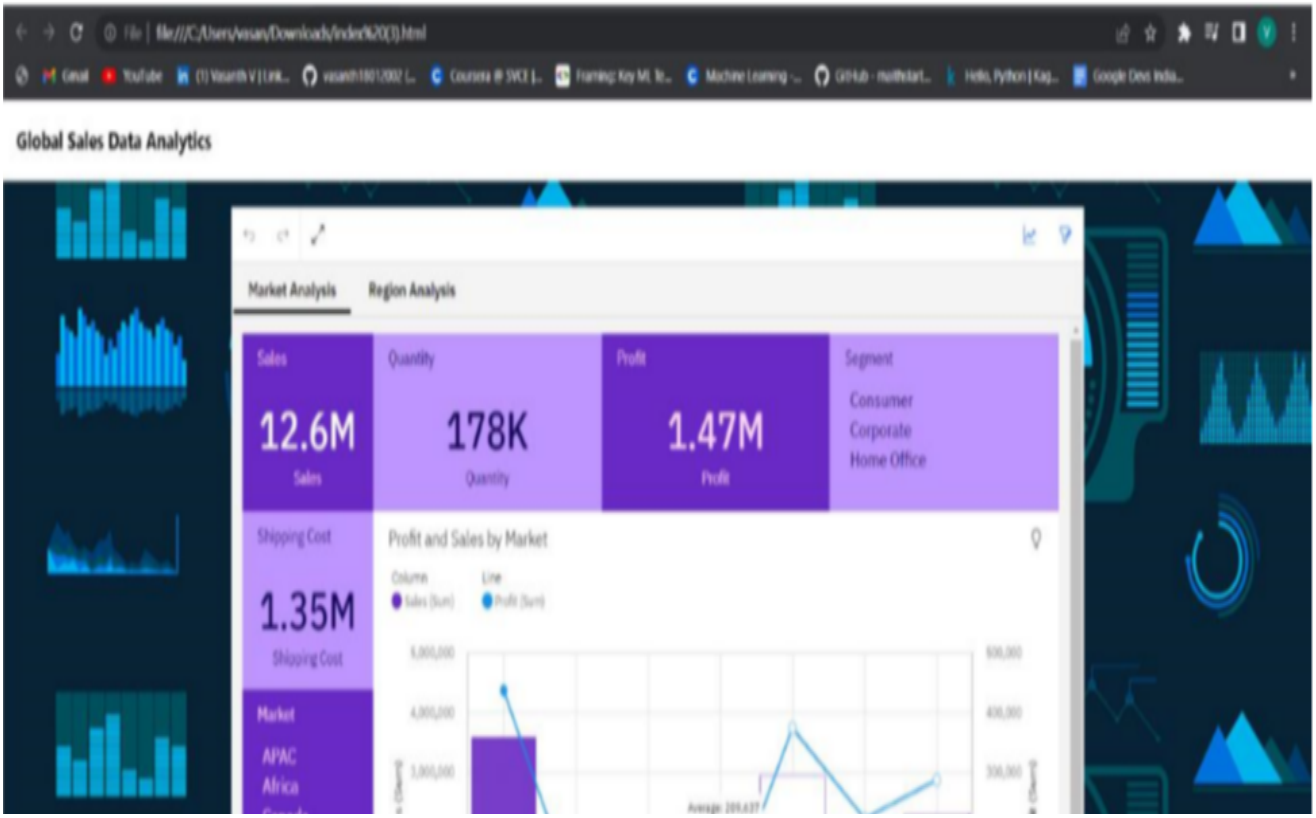
7.2 Report

Region Analysis
Region
Search
Africa
Canada
Caribbean
Central
Central Asia
EMEA
East
North
North Asia
Apply
Quantity by Category
Furniture
Office Supplies
Technology
Category
Ship Date by Ship Mode
Ship Mode
Same Day
First Class
Second Class
Standard Class
795
1,141
1,149
1,461
Profit and Sales by Sub-Category
Column
Line
Sales (Sum)
Profit (Sum)
Sub-Category
Sales by Order_Month colored by Region
Forecast
Region
Africa
Canada
Caribbean
Central
Central Asia
EMEA
East
North
North Asia
Oceania
South
Southeast Asia
West
Average: 81,562
Order Month

7.3 Creating the Web App



8. Result


Global Sales Data Analytics
Market Analysis
Region Analysis
Sales
12.6M
Sales
Quantity
178K
Quantity
Profit
1.47M
Profit
Segment
Consumer
Corporate
Home Office
Shipping Cost
1.35M
Shipping Cost
Profit and Sales by Market
Column
Line
Market
APAC
Africa

9. Advantages and Disadvantages

9.1 Advantages

Sales data can help companies estimate future stocking based on past experience, and plan marketing campaigns ahead of time. Based on historical data, online retailers can predict future sales, and prepare a proper number of goods in the warehouse. Using social listening, they can discover new buzzwords and react promptly to catch golden opportunities to make more sales.

With Sales data analytics tools, business owners are enabled to look at the greater picture and monitor the pricing of competitors in real-time. This requires a large data set with all the prices of competitors, which needs to be updated time to time since the market price is always changing. Sales data analytics tools can track the buying journey of customers. They capture interactions a user previously had with a brand, including products viewed, clicks, past purchases, etc.

The data allows business owners to get the shoppers' information and understand the shoppers in depth- what they like and dislike, which products are in hot demand recently, what time of the year the demand for certain products rises, etc. Sales data analytics helps improve customer service in many ways.

By monitoring the average response speed, customer service staff can increase overall response timeliness; by sending out questionnaires and collecting customer feedback, it provides first-hand info to help improve the service quality and reduces the chance of bad service; by monitoring other data such as the delivery time of the goods, e-store owners can identify issues in the delivery process and avoid possible transportation problems.

9.2 Disadvantages

➤ Data security

When dealing with analytics outsourcing partners, organizations have to be prepared for the risk of exposing sensitive organizational data. That said, there are numerous ways to ensure that an analytics provider is trustworthy and able to keep all company data confidentia. Therefore, before working with an outsourcing partner, do your research to pick a provider that can ensure the safety of your data using clear, specific strategies.

➤ Low speed of data entry

There is no way a man can compete with the machine in term of processing speed. In data security situation involving going through millions of items to check for data integrity and data validation to ensure high accuracy of data element going into a system, the low-speed nature of manual data input will cause system failure. Imagine a surveillance system where human is allowed to check every person entering a premise manually the low speed in reviewing everyone incoming and outgoing people will create high traffic that may shut down the system

➤ Inconsistency

In an environment where consistency of data is crucial to the success of the system, manual data entry service is always a disadvantage as maintaining consistency for humans is a challenging task that must be avoided.

➤ High cost of training

One of the advantages of the automated system is the low cost of doing business, but using manual data entry system mean more personnel will be engaged to increase service delivery and each member of the workforce must be trained to meet the basic standard required to perform assigned tasks

10. Conclusion

In this project, After making this application we assure that this application will help its users to manage their sales in a best way. It will guide them and make them aware about their product sales and customer relation. It will prove to be helpful for the people who are frustrated with on analysis of their business because of the inaccurate in data and less collection method. In short, this application will help in analysis of sales pattern and customer analysis

11. Future Scopes

➤ Data collection

One automatic data analytics process involves creating a library of information to evaluate. As automation tools benefit from having as many data points as possible, optimizing your data collection process can help produce more informative results. Compared to employees manually entering data into a spreadsheet, automation technology can also extract important information from user interactions more efficiently

➤ Business intelligence

Another type of automated data analytics is the creation of business intelligence metrics. These processes typically track emerging trends in your business. For example, business intelligence can examine which geographic locations are producing the most orders, and compare these numbers to the marketing budget in those areas. These comparisons also allow you to make accurate estimations about where advertising is the most effective.

➤ Machine-learning models

Machine-learning programs create statistical models for tracking changes in

business operations. These programs analyze data points and identify trends to predict what a business' financial future might look like. Machine-learning models can also help predict changes in the market that might affect a business' profitability. Using machine-learning models, companies can determine what actions can help them stay competitive in an industry.

Source Code

Github Link ： https://github.com/IBM-EPBL/IBM-Project-40506-1660630450

demo link: https://youtu.be/2RWkqsAmkd0