

# Global Sales Data Analytics

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## **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. Parallely, 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.

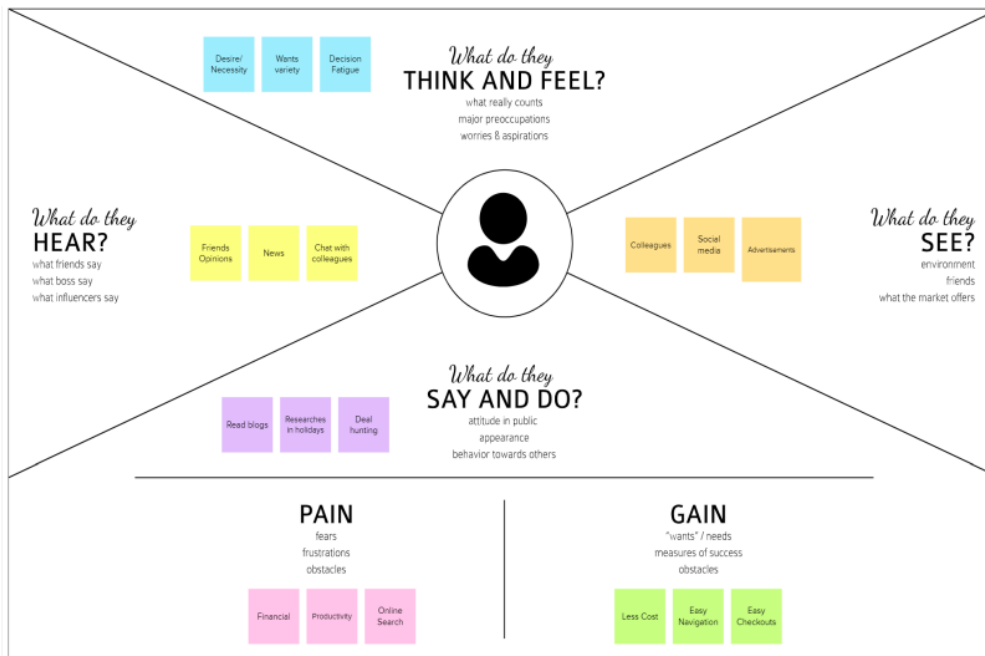
After acquiring Goodreads in 2013, Amazon integrated the social networking service of roughly 25 million users with some Kindle functions. This enabled the users to highlight words and notes and also to share them among their peers as a means to discuss the book. The company benefited from this in a 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

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Shop owner	maximize sales	The profit is breaking even and not able to sell all goods	There are many competitor shops and the products that I buy are not favoured by the customer everytime	Depressed
PS-2	Business Owner	Increase profits	There are lots of cost involved in the sales funnel	There is no proper defined method to approach sales	Helpless
PS-3	Chief Marketing Officer	Monopolize the market	There are lot of competitors offering different features	Lack of proper unique selling point	Disappointed

### 3. Ideation and Proposed Solution

#### 3.1 Empathy Map Canvas



#### 3.2 Ideation & Brainstorming

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

Problem statement : To make a sales pattern analysis and customer analysis which would be leading to more accurate forecasting and quotas.

##### Step-2: Brainstorm, Idea Listing



### Step-3: Idea Grouping



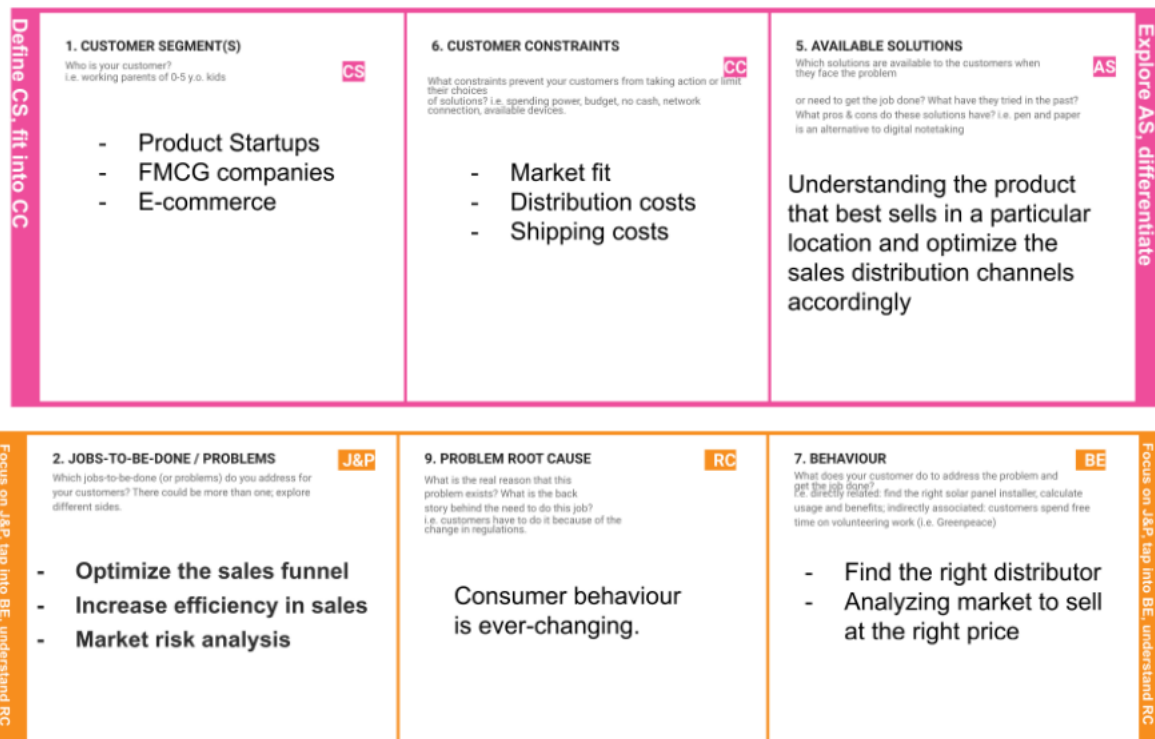
### Step-4: Idea Prioritization



### 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



Identify strong TR & EM	<b>3. TRIGGERS</b> <small>What triggers customers to act? i.e. seeing their neighbor installing solar panels, reading about a more efficient solution in the news.</small>  Profits decreasing Competitor performing well in market	<b>10. YOUR SOLUTION</b> <small>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 behavior.</small>  <ul style="list-style-type: none"> <li>- Analyze the market</li> <li>- Sell the right product at the right location</li> <li>- Improve the product based on customer needs</li> <li>- Marketing strategies</li> </ul>	<b>8. CHANNELS of BEHAVIOUR</b> <b>8.1 ONLINE</b> <small>What kind of actions do customers take online? Extract online channels from #7</small>  Search histories of products Geographical purchase data  <b>8.2 OFFLINE</b> <small>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</small>  Run Campaigns Pamphlet distributions	Identify strong TR & EM
	<b>4. EMOTIONS: BEFORE / AFTER</b> <small>How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure &gt; confident, in control - use it in your communication strategy &amp; design.</small>  Insecure			

## 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

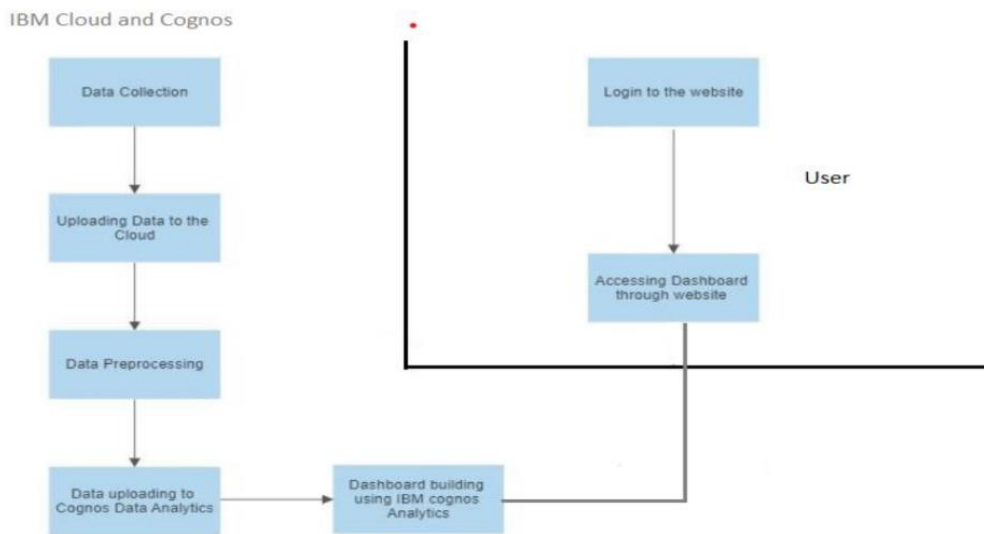
FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	The system must be easy to use, until the dashboard contains proper sales datasets, the user can use it
NFR-2	<b>Security</b>	The dashboards are only accessible with appropriate login credentials
NFR-3	<b>Reliability</b>	User dashboards must be available anytime without crashing
NFR-4	<b>Performance</b>	The performance and efficiency of the dashboard should be very high



NFR-5	<b>Availability</b>	Our model must be made available to access with any compatible web browsers and devices
NFR-6	<b>Scalability</b>	Dashboard must be quite flexible and should be easily adopted easily by any E-commerce business

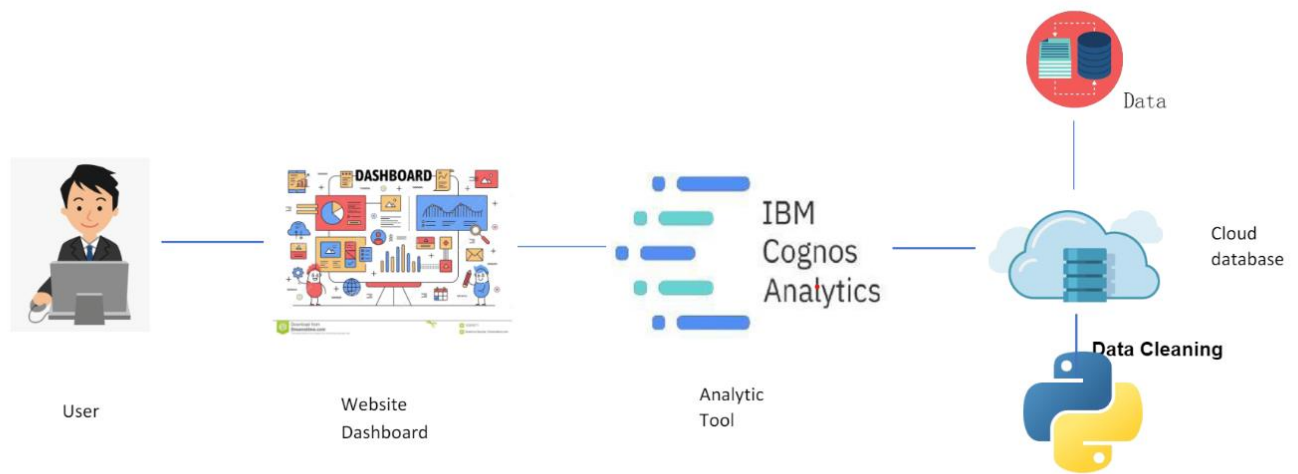
## 5. Project Design

### 5.1 Data-Flow Diagrams



### 5.2 Solution & Technical Architecture

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
<b>Sprint-1</b>	Registration	USN-1	As a user, I can register for the website by entering my email, and password, and confirming my password.	2	High
<b>Sprint-1</b>		USN-2	As a user, I will receive a confirmation email once I have registered for the application	2	High

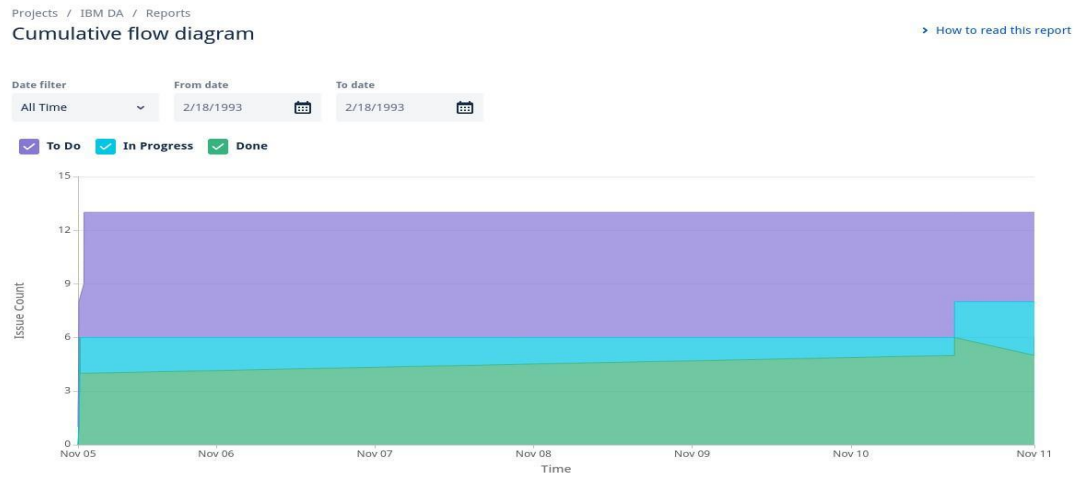
<b>Sprint-1</b>		USN-3	As a user, I can register for the application through Email	2	Medium
<b>Sprint-1</b>	Login	USN - 4	As a user, I can log into the application by entering email and password	2	High
<b>Sprint-2</b>	IBM Cognos Analytics	USN-5	As a user, I can enter sales data to clean and prepare it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

## 6.2 Sprint Delivery Schedule

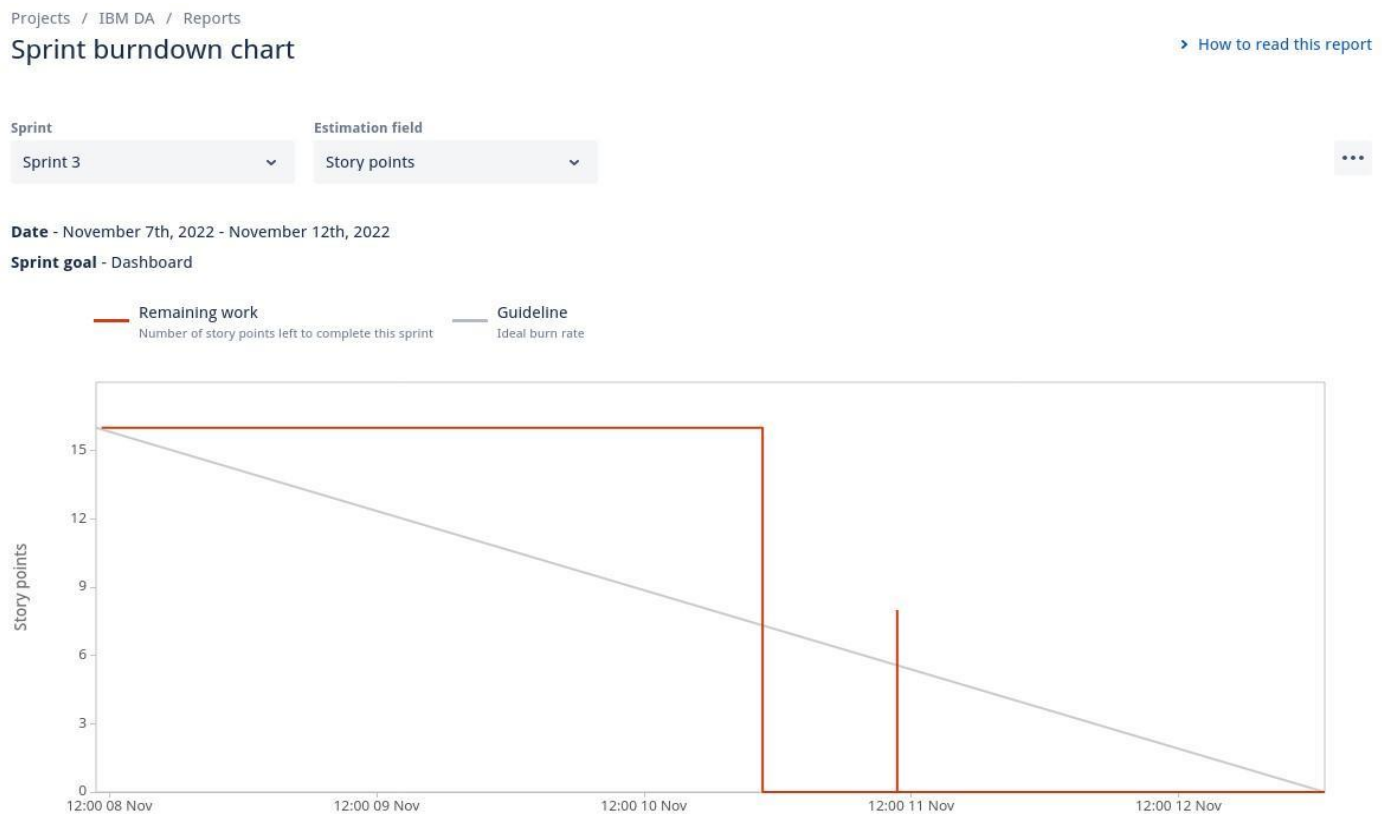
<b>Sprint</b>	<b>Story Points</b>	<b>Duration</b>	<b>Sprint Start Date</b>	<b>Sprint End Date</b>
Sprint-1	8	6 Days	24 Oct 2022	29 Oct 2022
Sprint-2	13	6 Days	31 Oct 2022	05 Nov 2022
Sprint-3	16	6 Days	07 Nov 2022	12 Nov 2022
Sprint-4	10	6 Days	14 Nov 2022	19 Nov 2022

## 6.3 Reports from JIRA

### a. Cumulative flow diagram



### b. Sprint burndown chart



## c. Burnup report

Projects / IBM DA / Reports

### Burnup report

[How to read this report](#)

Sprint

Sprint 2

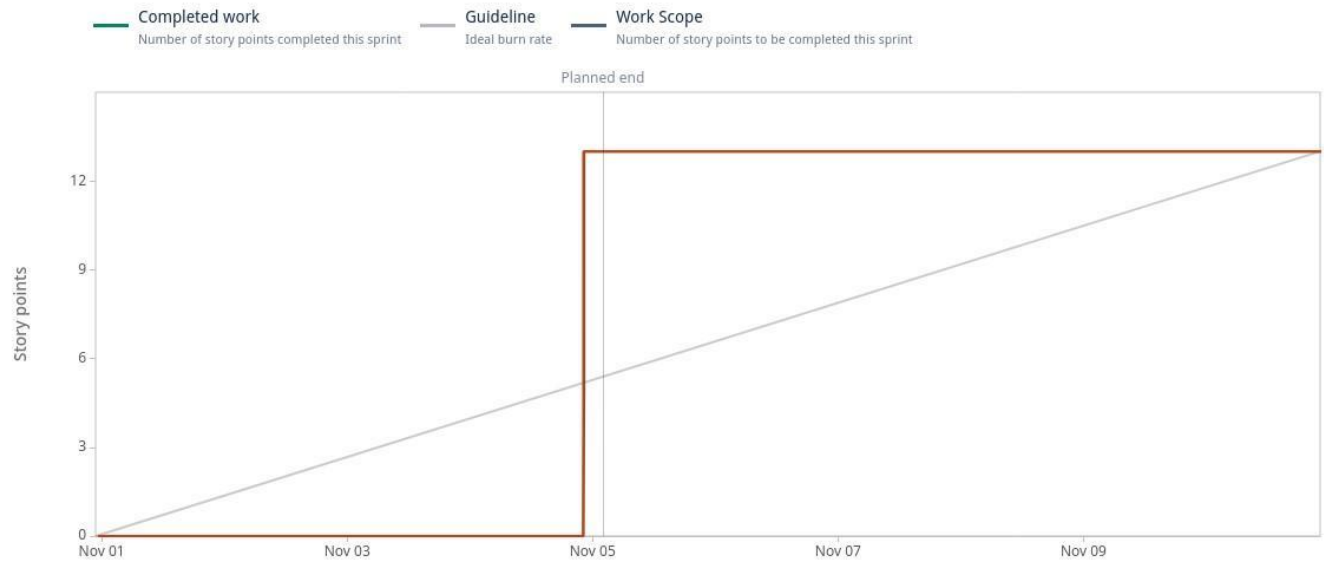
Estimation field

Story points

...

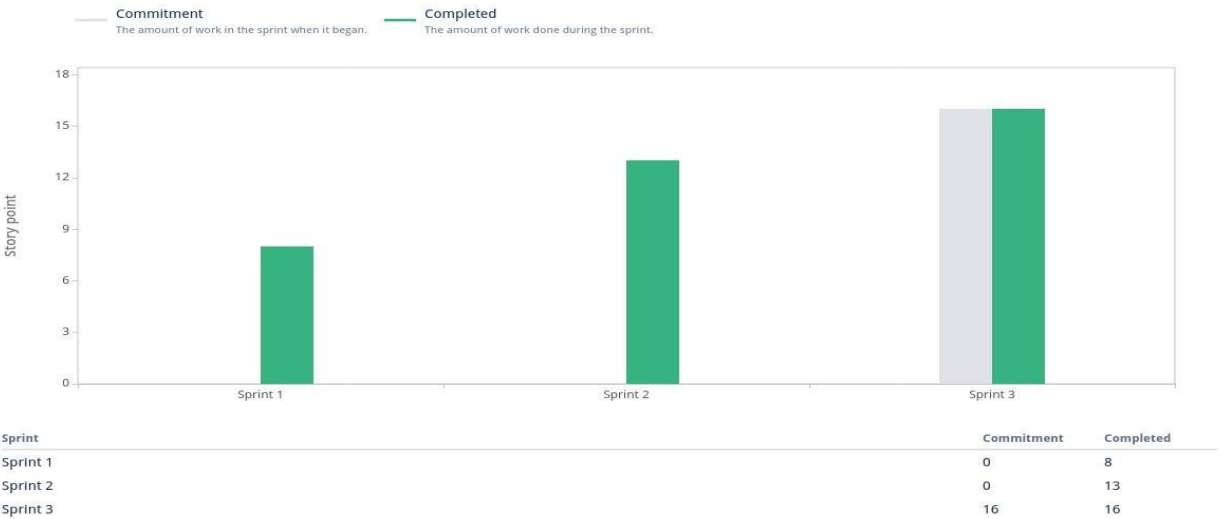
Date - October 31st, 2022 - November 5th, 2022

Sprint goal - Data Extraction



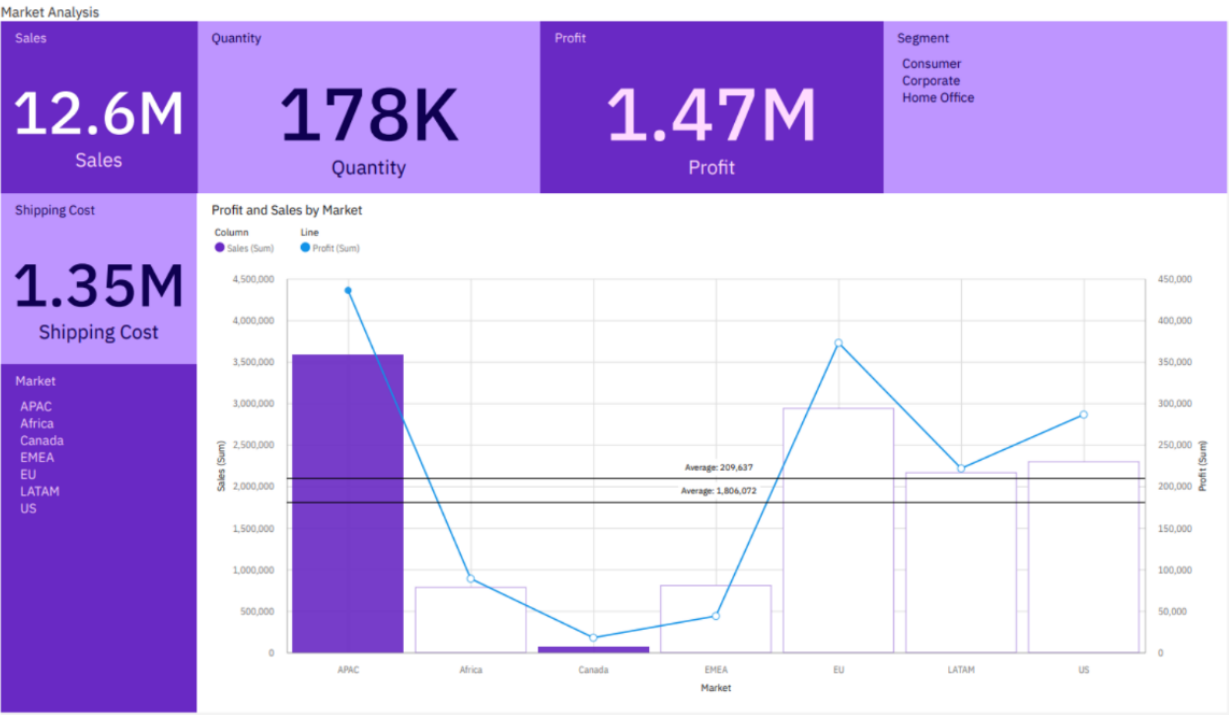
Date	Event	Issue	Completed	Scope
Mon, Oct 31 2022, 10:49pm	Sprint started		0	0
Fri, Nov 04 2022, 9:40pm	Added to sprint	GSDA-3 Data extraction and modification in accordance with the requirements	0	0
Fri, Nov 04 2022, 9:41pm	Added to sprint	GSDA-4 The loading of data, its conversion into a data module, and its preparation	0	0
Fri, Nov 04 2022, 9:41pm	Estimate updated	GSDA-3 Data extraction and modification in accordance with the requirements	0	0 → 5
Fri, Nov 04 2022, 9:41pm	Estimate updated	GSDA-4 The loading of data, its conversion into a data module, and its preparation	0	5 → 13
Fri, Nov 04 2022, 9:52pm	Issue completed	GSDA-3 Data extraction and modification in accordance with the requirements	0 → 5	13
Fri, Nov 04 2022, 9:52pm	Issue completed	GSDA-4 The loading of data, its conversion into a data module, and its preparation	5 → 13	13
Thu, Nov 10 2022, 10:16pm	Sprint completed	GSDA-3 Data extraction and modification in accordance with the requirements GSDA-4 The loading of data, its conversion into a data module, and its preparation	13	13

d. Velocity report



7. Coding & Solutioning

7.1 Dashboard



## 7.2 Report

### Region Analysis

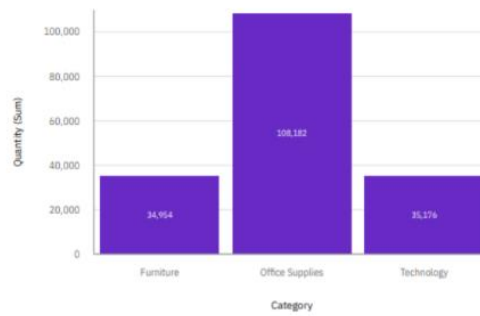
#### Region

Search

- ☐ Africa
- ☐ Canada
- ☐ Caribbean
- ☐ Central
- ☐ Central Asia
- ☐ EMEA
- ☐ East
- ☐ North
- ☐ North Asia

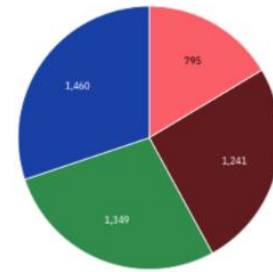
Apply

#### Quantity by Category

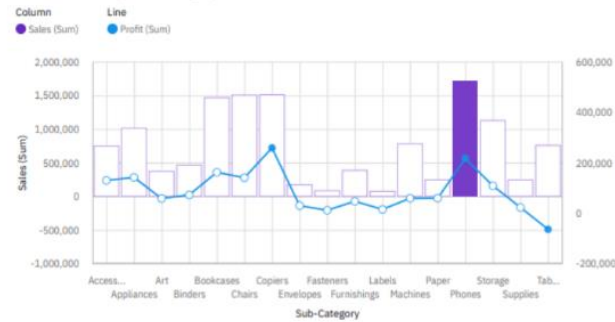


#### Ship Date by Ship Mode

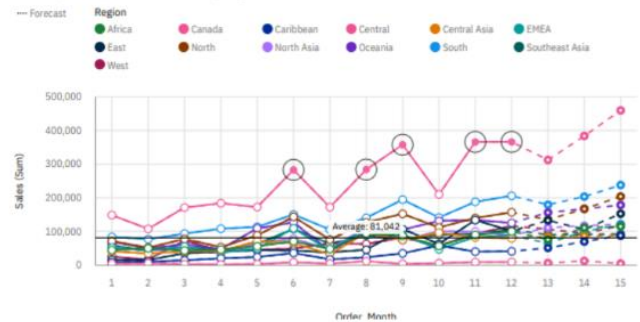
Ship Mode  
Same Day First Class Second Class Standard Class



#### Profit and Sales by Sub-Category



#### Sales by Order\_Month colored by Region

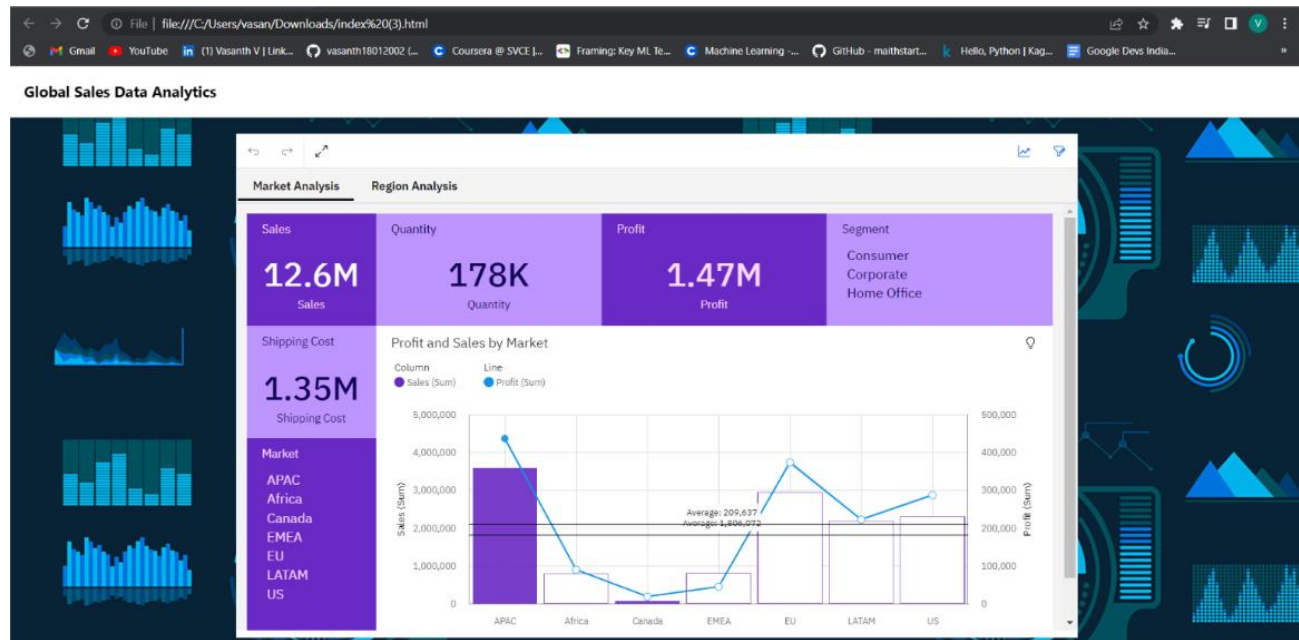


## 7.3 Creating the Web App

```
index (3).html - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help

1 <!DOCTYPE html>
2 <html lang="en" >
3 <head>
4 <meta charset="UTF-8" />
5 <meta http-equiv="X-UA-Compatible" content="IE=edge" />
6 <meta name="viewport" content="width=device-width, initial-scale=1.0" />
7 <title>Global Sales Data Analysis - IBM</title>
8 <script src="https://cdn.tailwindcss.com"></script>
9 </head>
10 <body class="h-screen overflow-hidden scroll-smooth bg-gray-100" background="https://png.pngtree.com/thumb_back/fh260/
background/20211118/pngtree-technology-round-dashboard-image_908915.jpg">
11 <header>
12 class="fixed top-0 p-4 bg-white border-b w-full shadow-md flex gap-8 justify-between items-center">
13 <h1 class="font-bold text-lg">Global Sales Data Analytics</h1>
14 </header>
15 <center>
16 <section id="report" class="h-screen p-5 pt-20">
17 <iframe
18 src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;pathRef=.my_folders%2FGlobalSalesAnalytics&amp;closeWindowOnLastView=true&amp;
19 ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;mode=dashboard&amp;subView=model000001848baeca4_000000000"
20 width="1000px"
21 height="600px"
22 frameborder="0"
23 gesture="media"
24 allow="encrypted-media"
25 allowfullscreen=""
26 class="border"
27 ></iframe>
28 </section>
29 </center>
30 </body>
31 <script>
32 const links = document.querySelectorAll("a.link");
33 links.forEach((el) => {
34 el.addEventListener("click", (e) => {
35 e.preventDefault();
36 document
37 .getElementById(el.getAttribute("data-href"))
38 .scrollIntoView({ behavior: "smooth" });
39 const currActive = document.querySelector("a.link.active");
```

## 8. Result



## 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 confidential. 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-12523-1659452714>

Project Demo: <https://youtu.be/aKv-uTRnzCc>