RETAIL STORE STOCK INVENTORY ANALYTICS

NALAIYA THIRAN PROJECT BASED LEARNING

ON

PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

A PROJECT REPORT

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1. INTRODUCTION

Analytics is the discovery and communication of meaningful patterns in data. As a topic, analytics has found its way from being discussed at the side lines of industry and technology conferences, to the top of the corporate agenda. With the existing promise of delivering performance improvements not seen since the redesign of core processes in the 1990s, these tools are likely to change the competitive landscape in many industries in the years to come.

Big Data is all about the non-traditional ways of dealing with the modern digital data. We exist in an ocean of digital data. It includes data stored in piles of well-structured databases residing with organisations, streams of data generated from the dynamic social networks, various understandable and intangible signals generated by all kinds of digital equipment all over the place. For an organisational, Big Data can be about identifying the right datasets from large amount of data commonly defined by the three Vs - Volume, Velocity and Variety; transforming them into readily consumable models; and then extracting meaningful insights for devising business strategies. These insights can be used to improve different aspects of the business - from marketing and sales, to research and operations, and customer services.

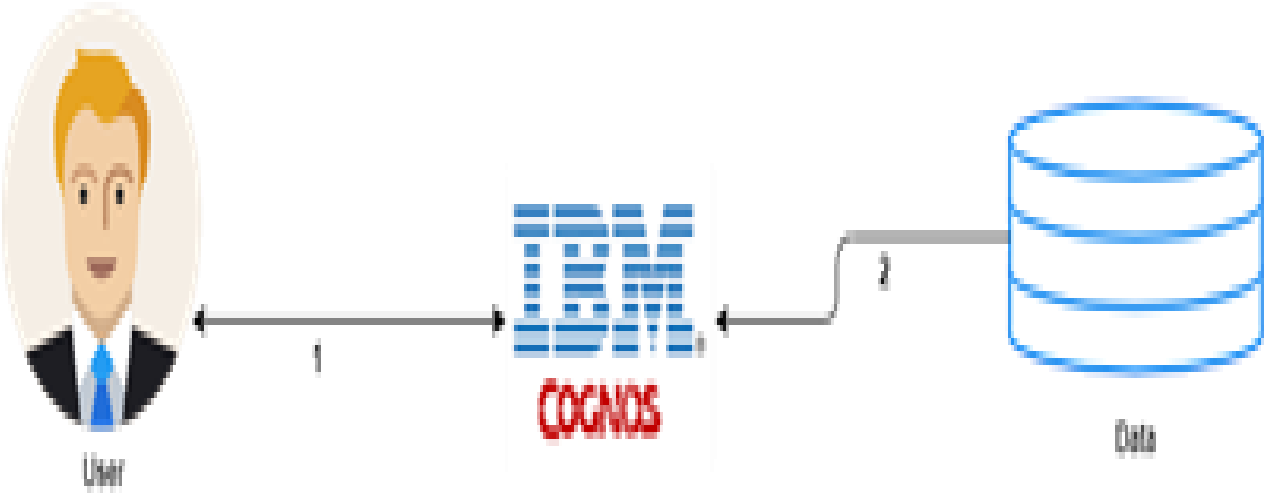
Big Data enables clients in the retail Industry to track and better understand a variety of information from many different sources like CRM, AdWord/AdSense analytics, inventory management system, emails, transactional data, sensors data etc. Industry can identify the current trends, re-order supplies for hot-selling items, adjust the prices in real time and also manage and control product distribution across different stores to channelize their sales in more effective manner. This provides retail industry with entirely different perspectives of looking towards the datasets available at their disposal. By collating these organisational datasets with social media data streams, they can also use it for better sales predictions, designing relevant campaigns to suit their profitable customers and thereby ensuring customer satisfaction

Retail inventory management is the process of ensuring you carry products that shoppers want, with neither too little nor too much on hand. By managing inventory, retailers meet customer demand without running out of stock or carrying excess supply. Inventory management is vital for retailers because the practice helps them increase profits.

They are more likely to have enough inventory to capture every possible sale while avoiding overstock because too much inventory means working capital costs, operational costs, and a complex operation. Based on the inventory management analysis we can manage how much inventory is required for selling the product based on which they can calculate the profit and losses.

Data analytics is the science of raw data analysis to draw conclusions about it. Data Analytics refers to the techniques for analyzing data for improving productivity and the profit of the business. Data is extracted and cleaned from different sources to analyze various patterns. Many data analytics techniques and processes are automated into mechanical processes and algorithms which handle raw data for human consumption.

Our dataset contains a lot of historical sales data of a Brazilian top retailer Basic Questions of every retailer: How much inventory should I carry? Too much inventory means working capital costs, operational costs and a complex operation, lack of inventory leads to lost sales, unhappy customers and a damaged brand. This is why short-term forecasting is so important in the retail and consumer goods industry



1.1 PROJECT OVERVIEW

The Main Project Consist of four different modules namely,

- Data Collection and Preparation.
- Data Exploration.
- Data visualization.
- Dashboard creation.

The dataset is uploaded in the IBM CLOUD for storage purposes.

In the first step of Our Project, we will be collecting the dataset and move on to Data Preparation.

In the second step, the obtained dataset will be cleaned, which is known as Data Exploration and formatted using the tool “IBM COGNOS ANALYTICS”.

At the third step using the cleaned dataset to produce different visualizations like,

1) Year Wise Price Using Line Graph.
2) Year Wise Stock Using Line Graph.
3) Top10 Sales by Year Using Line Graph.
4) Top10 Revenue by Year Using Line Graph.
5) Monthly Stock Using Heat Map.
6) Monthly Sales Using Tree Map.
7) Monthly Revenue by Pie Chart.
8) Summary Cards of Total Revenue, Sales, Stock, Price.

In the last step, Using the obtained different visualizations, an analytical Dashboard will be created.

This Dashboard contains the overall progress of the Retail Store.

This analytical Dashboard can be used to gain insights and forecasting can also be performed. Also in the last step, we will create a report and a story for briefing the information of the Retail Store.

In this project, the dataset of a client is analysed using the IBM COGNOS ANALYTICS WITH WATSON. To gain the entire performance of the store.

1.2 PURPOSE

By the end of this Project, you will be:

Knowing fundamental concepts and can work on IBM Cognos Analytics.

Gain a broad understanding of plotting different visualization to provide

suitable solution, Able to create meaningful Visualization and

Dashboard(s).

The right dashboard can revolutionize both your success and enjoyment in running your business.

Most specifically, the purpose of a dashboard is as follows:

1. Total Visibility into Your Business.

2. Big Time Savings

3. It's main purpose is to Improve end Results

4.Better accurate results

5.Increased productivity

6.Increased Profits

7.Overall performance of store for further analysis.

8.Customer Satisfaction Ratio

9.Avoids losses and excess stock storage

10.Acts a One stop solution

Retail Sales measures the gross receipts of a retail store by selling durable and nondurable goods. The main components of retail sales are grocery, food & clothing and shoe retailing. In India, consumer spending roughly accounts for over 60% of GDP and is therefore, a vital element in the country's economic growth. Any change in retail sales pattern is important and is seen as the timeliest indicator of wide consumption patterns. Retail sales may have short-term and long-term goals in nature. Short-term retail sales goals are supposed to support and merge into long-term goals

2.LITERATURE SURVEY

TITTLE AND AUTHOR(S)	YEAR OF PUBLICATION	FINDINGS
Inventory Management of a Fast-Fashion Retail Network Authors: Felipe Caro, Jeremie Gallien	**2010**	In this article we can find details about automation of Inventory for fasten sales. This paper deals with currents trends in the retail network. This paper tells us to create a direct contact between a retailer and a manufacturer, thus it can result in high sales and high profit margin for both.
Business Intelligence Dashboard in Decision Making Authors: Hansoti, Bhumika	**2011**	In this paper, we can observe that how dashboarding helps an organization to make decision quickly. And it also helps in identifying the various use cases of dashboards as it is a Overall result of a data gathered from the source. Hence, these dashboards helps to identify the right choice of action need to be taken
Review of modern inventory management techniques Authors: Aro-Gordon, Stephen and Gupte, Jaideep	**2016**	In this article, we can understand the basic inventory management techniques, stock level parameters. It is also deals with some important parameters for effective inventory management like ✓ Re-ordering level ✓ Maximum stock limit ✓ Average stock level. ✓ Danger level. ✓ Economic order quantity.

A review on data analytics for supply chain management: a case study Authors: Anitha p, Malini M. Patil	2018	This article states the use of data analytics in the supply chain management. The data analytics can gain more results and course of actions need to be taken to achieve proper control over the inventory. Using data analytics the clustered information about the business can be obtained for further processing.
The impact of adding online-to offline service platform channels on firms' offline and total sales and profit. Authors: Sha zhang and koen Pauwel and Chenming peng.	2019	This study deals with the use of online store marketing. It also gives an idea on maintaining both online offline sales at the same instances. As it increases the net sales of products sold in retail industry. And it also states the uses of online marketing and it future scopes.
Inventory Management in Supply Chain Authors: Deepesh Singha, Ajay Verma	2018	This paper gives a brief information about supply chain Management, how the flow is carried out from the manufacturer to end user(customer). It also explains how much time it requires for getting a finished good. The Purpose of this paper is to overview the Inventory management in supply chain and their current Inventory related issue

2.1 EXISTING PROBLEMS

The major existing problems in retail stock inventory management is followed as

- Usage of spreadsheets in data collection.
- No proper insights from the solution
- Lack of good end results
- Using manpower resources in developing visualizations.
- Non-automatic services.
- Applications development with more cost expensive.
- Using websites and google link to view customer constraints.
- No proper user interface.

2.2 REFERENCE

1) Fink, Conducting research literature reviews: From the internet to paper. Sage publications, 2019.

2) J. Kembro y A. Norrman, “Exploring trends, implications and challenges for logistics information systems in omni-channels : Swedish retailers’ perception”, International Journal of Retail and Distribution Management, vol. 47, núm. 4, pp. 384–411, 2019, doi: 10.1108/IJRDM-07-2017-0141.

3) G. Hançerlioğulları, A. Şen, y E. A. Aktunç, “Demand uncertainty and inventory turnover performance: an empirical analysis of the US retail industry”, International Journal of Physical Distribution and Logistics Management, vol. 46, núm. 6–7, pp. 681–708, 2016, doi: 10.1108/IJPDLM-12-2014-0303.

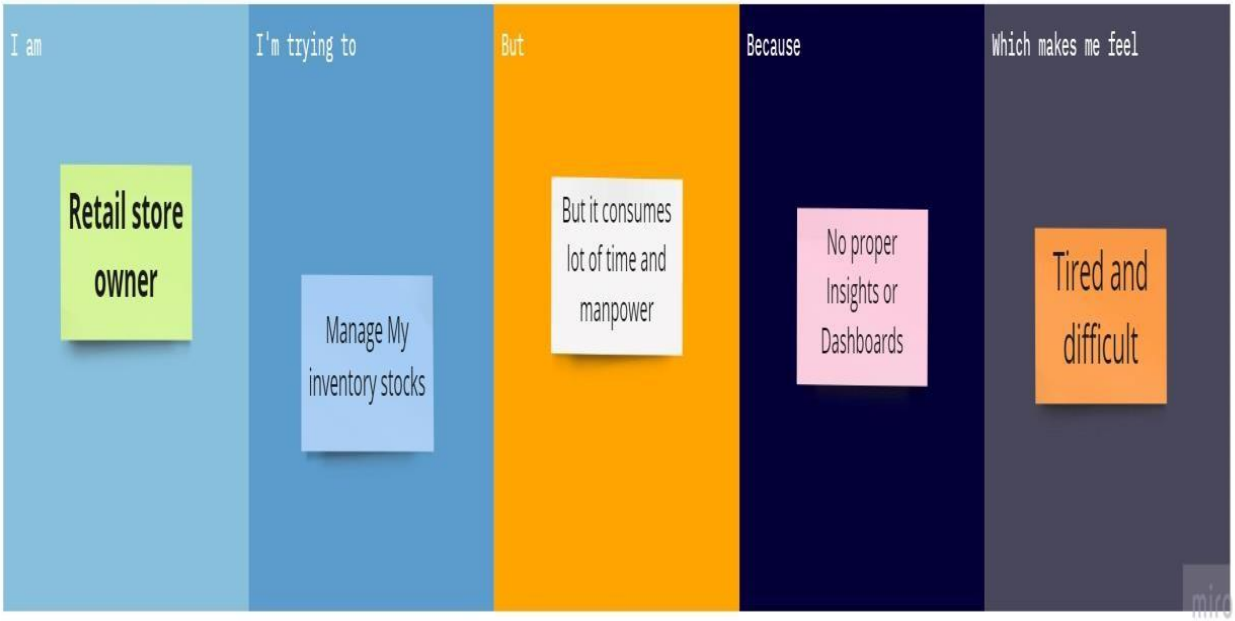
4) A. Hübner, A. Holzapfel, y H. Kuhn, “Operations management in multi-channel retailing: an exploratory study”, Operations Management Research, vol. 8, núm. 3–4, pp. 84–100, 2015.

2.3PROBLEM STATEMENT DEFINITION

One of the main Problem in retail industry is that lack of personalized dashboards. which gives a clear overview about the

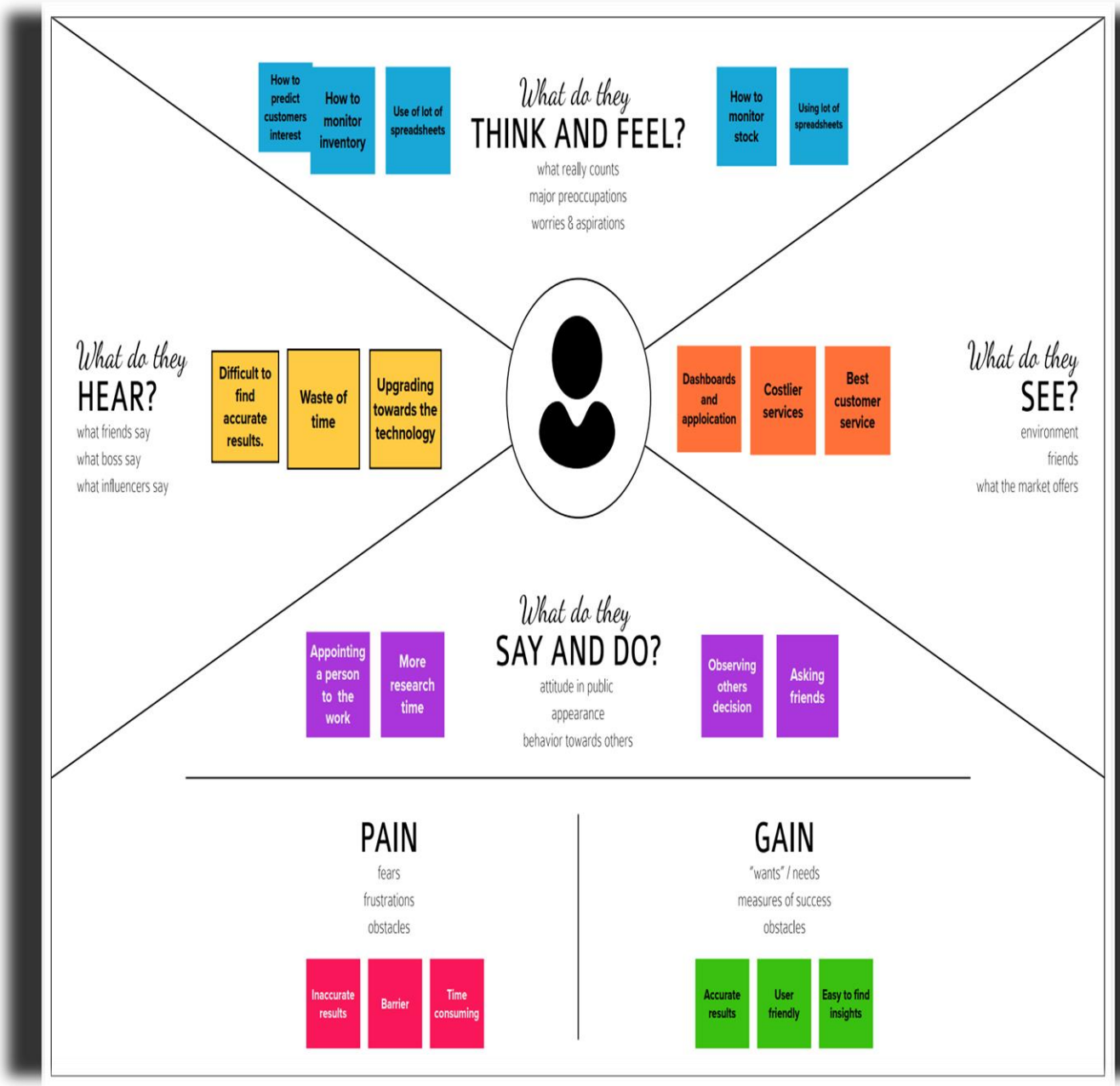
- ✓ Most sold items.
- ✓ Least sold items.
- ✓ Area in which improvements should be done.
- ✓ Overall sales
- ✓ Overall profit or loss
- ✓ Customer Satisfaction and so on.

Another problem is that lack of predicting customer buy back, which is key element in inventories management.

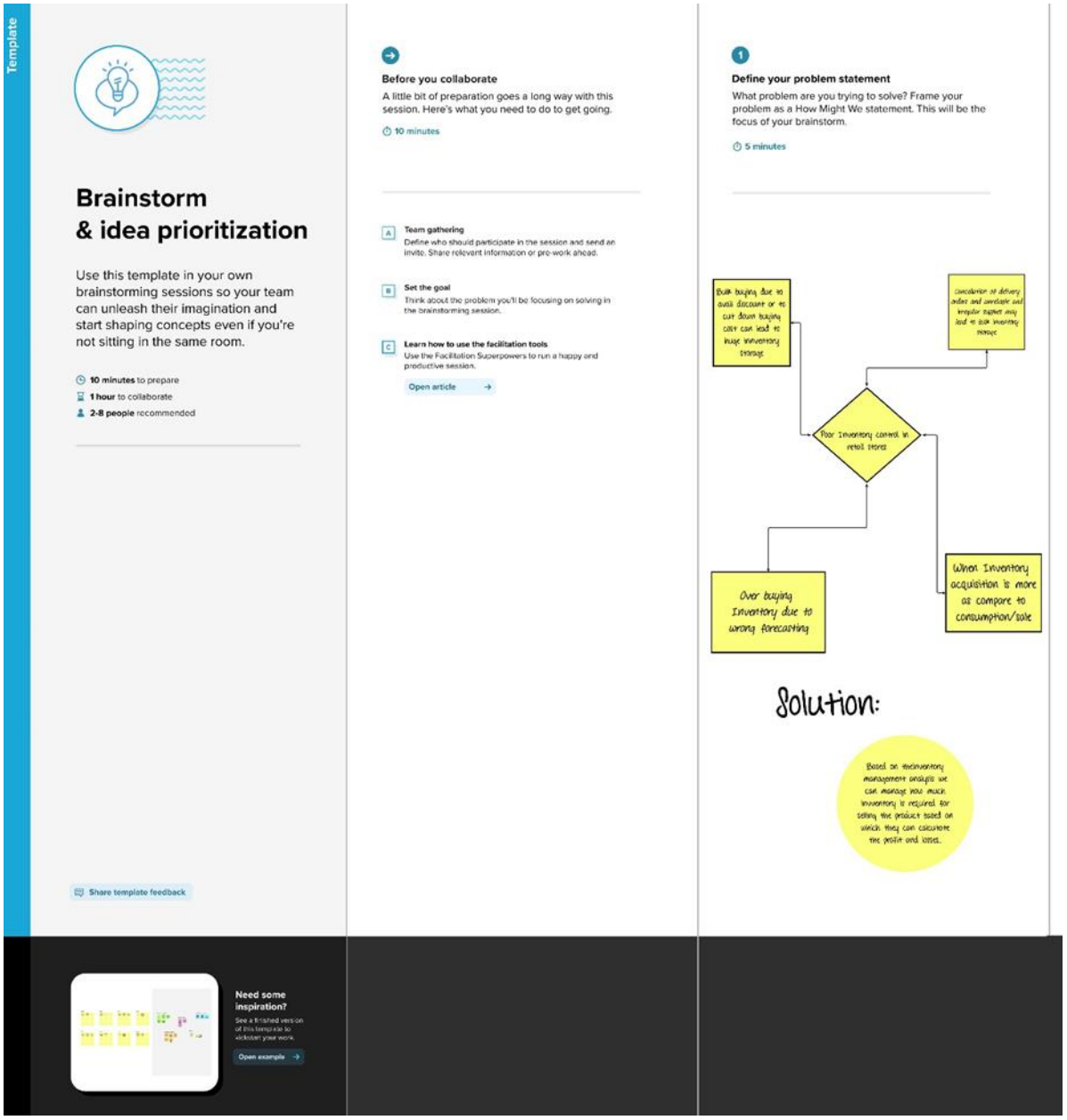


3.IDEATIONAND PROPOSED SOLUTION

3.1EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTORMING

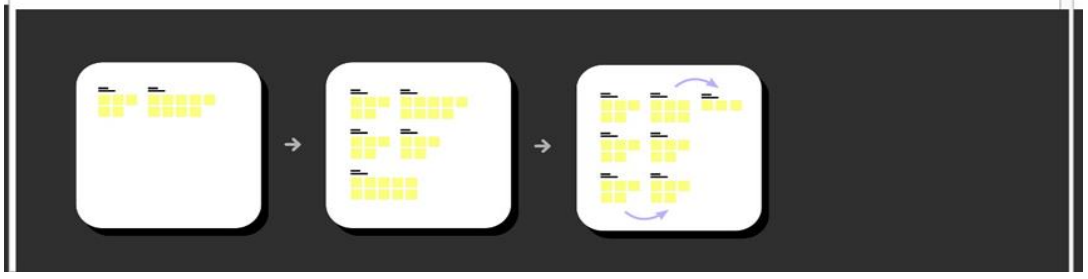


3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, 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.

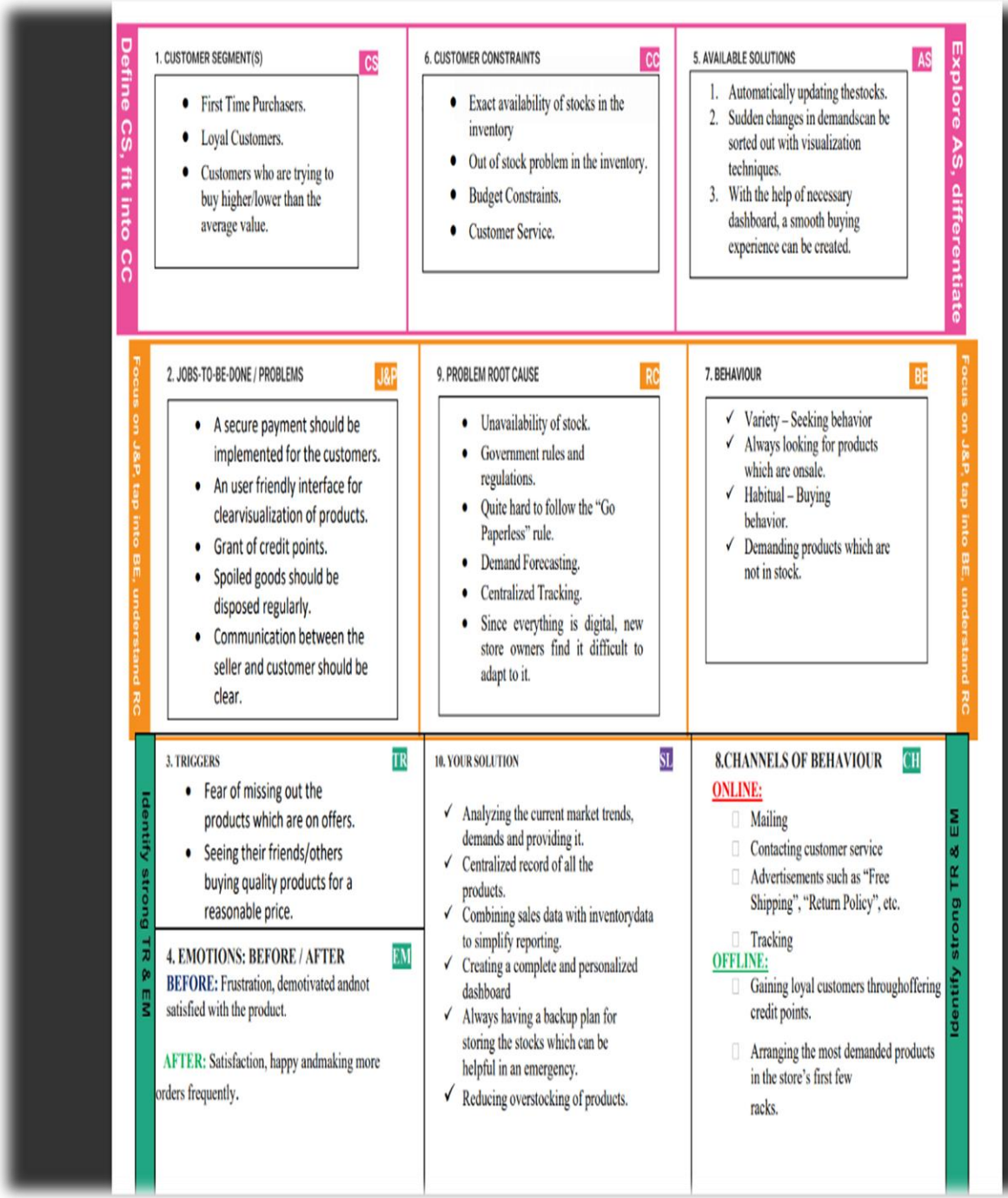
20 minutes



3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	One of the main Problem in retail industry is lack of personalized dashboards. which gives a clear overview about the ✓ Most sold items. ✓ Least sold items. ✓ Area in which improvements should be done. ✓ Overall sales ✓ Overall profit or loss ✓ Customer Satisfaction and so on. Another problem is lack of predicting customer buy back, which is key element in inventories management.
2.	Idea / Solution description	Our solution contains a personalised dashboard, which can be further automated
3.	Novelty / Uniqueness	Our dashboard design will reduce the amount of visual noise and
4.	Social Impact / Customer Satisfaction	This solution can result in accurate insights. As it is digitalized, reports can be analysed remotely. It can be used to forecast the future sales. It will have good user interface.
5.	Business Model (Revenue Model)	It can be easily converted into a business model. It is help full for Retail store owners
6.	Scalability of the Solution	It can be scaled up to make huge impact.

3.4 PROBLEM SOLUTION FIT



4. REQUIREMENT ANALYSIS

4.1 Functional Requirements:

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 G-mail Registration through Form Registration through Linked INRegistration through Website
FR-2	**User Confirmation**	Confirmation via EmailConfirmation via OTP
FR-3	**User Login**	Login with usernameLogin with password
FR-4	**Profile update**	Update the user credentialsUpdate the Contact details and required additional (address)information.
FR-5	**Uploading Data**	Collect the customer details as well as product detailsUpload the product details This model predicts the best sold products and also, it analysisthe available stocks
FR-6	**Recommendation**	User will request for Item Get the Item recommendations

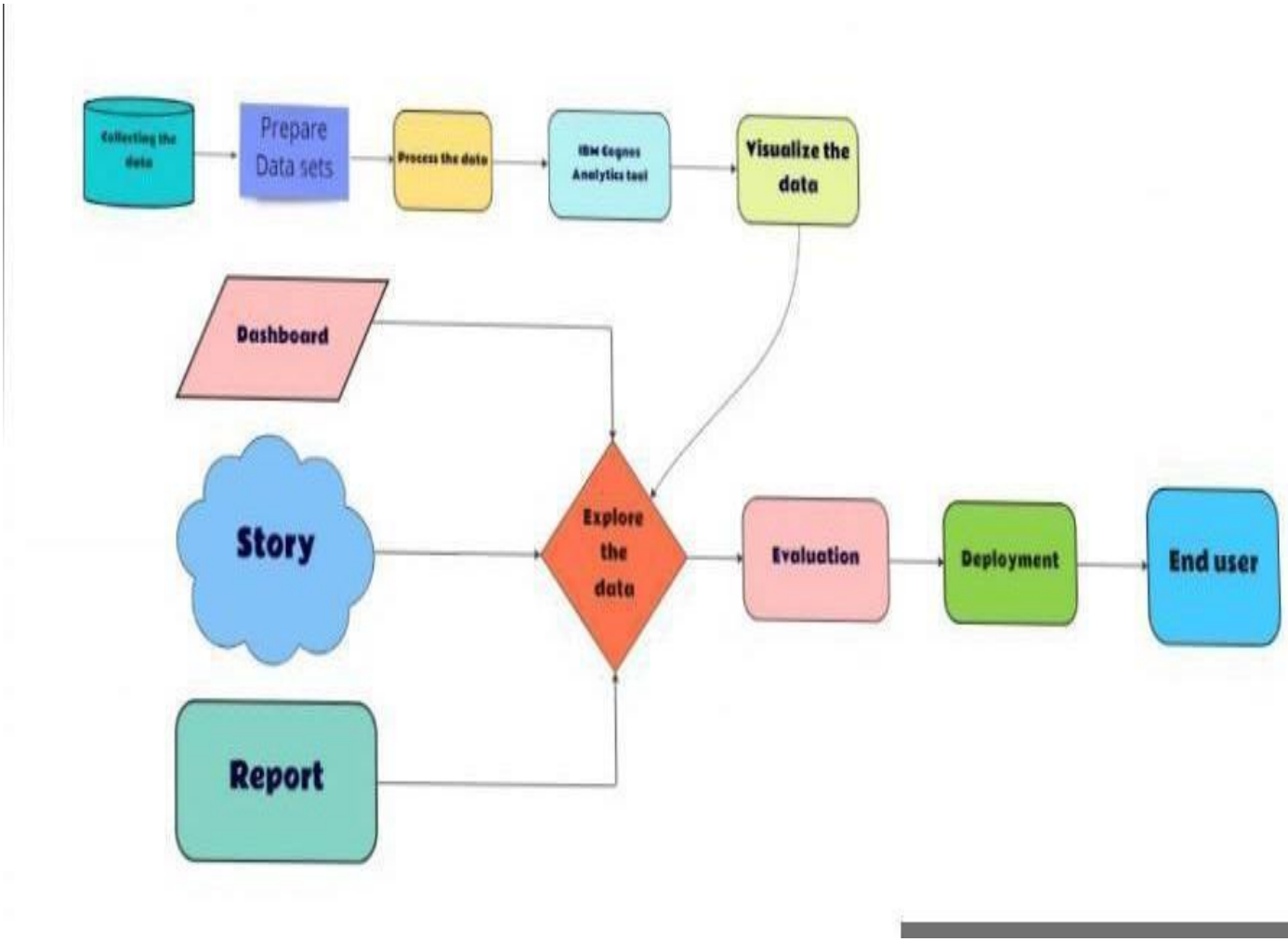
4.2 Non-Functional requirements

Following are the non-functional requirements of the proposed solution:

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The solution can be used for gaining overall information the store They are more likely to have enough inventory to capture every possible sale while avoiding over stock and minimizing expenses.
NFR-2	**Security**	Proper authentication. This can be used only by the users who have theirproper login credentials
NFR-3	**Reliability**	Accurate insights generation Avoid over or under stocking Ensure accurate inventory valuation Exact sales and stock reports. Reduce dead stock
NFR-4	**Performance**	In retail stores, the billing technique is digitalized. The database of the customer that is the name of the customer, mobile number, address and the purchase details of the customer are included in the dataset. From this, the model can predict the dead stocksand highly profitable stocks. The accuracy of this model will be ensured by checking multiple times.
NFR-5	**Availability**	This model is suitable for all kind of retail stores. It can give retailers real-time visibility into stock levels, avoidstock outs, keep inventory carrying costs low and help meet customer expectations.
NFR-6	**Scalability**	More number of users can be accessed at the same time without any issues. The feedback of the users will be taken and be proceeded further up to the satisfaction of the user.

5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION & TECHNICAL ARCHITECTURE

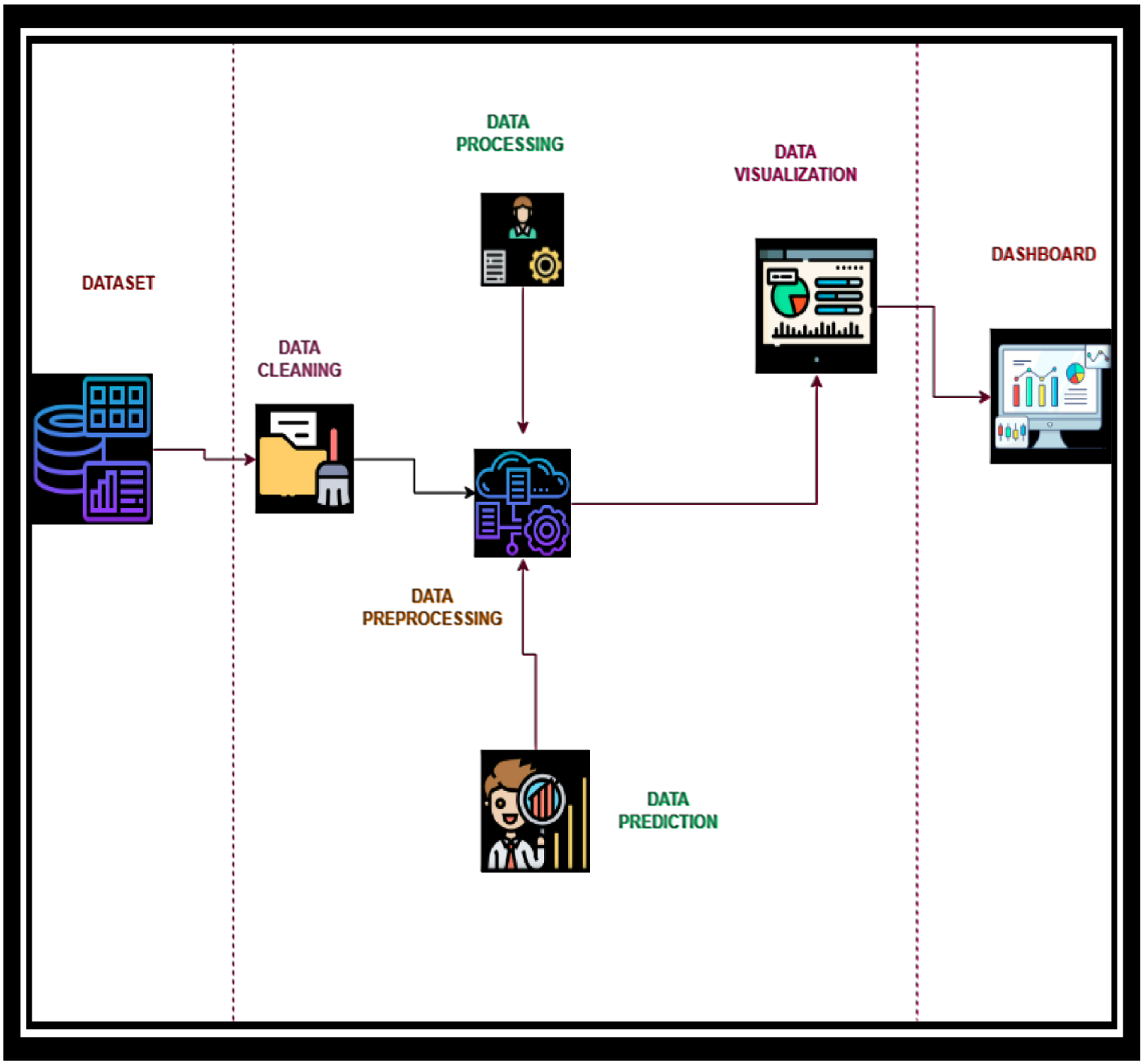


TABLE2:COMPONENTS & TECHNOLOGIES:

S. No	Component	Description	Technology
1.	User Interface	The user interacts with application using Web UI	HTML, CSS, JavaScript
2.	Data Processing	The data from the dataset is pre-processed	IBM Cognos Analytics
3.	Cloud Database	The clean dataset is stored on IBM Cloud	IBM Cloud
4.	Data visualization	The data is visualized into different forms	IBM Cognos Analytics, Python
5.	Prediction	These Algorithm techniques are used to predict the proper way to make the stock instore.	ML algorithm– Logistic Regression, LinearRegression, RandomForest,ABC Techniques.

TABLE-2: APPLICATION CHARACTERISTICS:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Open-source frameworks used	IBM Cognos Analytics, Python
2.	Security Implementations	Request authentication using Encryptions	Login and password
3.	Scalable Architecture	Scalability consists of 3-tiers	Web Server – HTML, CSS, Javascript Application Server –Python Database Server – IBM Cloud
4.	Availability	The application is available for cloud users	IBM Cloud Hosting
5.	Performance	The user can know how to maintain the inventory to increase profits.	ML algorithms

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Administrator		USN-1	As a user, I can register for the webapplication through LinkedIn.	I can register & accessthe dashboard with LinkedIn Login	Low	Sprint-2
		USN-3	As a user, I can register for the webapplication through Google account.	I can register & accessthe dashboard with Gmail login	Medium	Sprint-1
	Login	USN-4	As a user, I can log into the web applicationby entering email & password after installing the application.	I can access the dashboard by login intothe website or application.	High	Sprint-1
	Dashboard	USN-2	As a user, I can view the charts and graphsrepresentation of the dataset and the information shown in the dashboard.	I can analyse the stocksin my retail store.	High	Sprint-1
Customer Care Executive		CCE-1	As a customer care executive, I will alwaysbe available for the interaction with the customer to clarify the queries.	An executive will analyse the customer complaints, rectify their problems	High	Sprint-2
Administrator		ADMIN-1	As an administrator, I will manage backupand recovery, data modelling and design, distributed computing, database system, and a data security	Administrator can evaluate, design, review and implementing a data, they are also responsible for updatingand maintaining the data.	High	Sprint-2
		ADMIN-2	As an administrator, I should be able togo through or navigate the entire Dashboard	Validation of the reportsand insights	High	Sprint-3

6.PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION:

MILESTONES	ACTIVITIES
MILESTONE-I	• Understanding the dataset. • Loading the dataset onto IBM Cognos Analytics
MILESTONE-II	• Preparing the data. • Exploring the data. • Visualizing the data.
MILESTONE-III	• Creating a login portal. • Creating an interactive Dashboard. • Monitoring user sessions and providing authentication
MILESTONE-IV	• Monitoring Stock prices using visualization charts. • Maintaining a threshold to alert the system on understock or overstock
MILESTONE-V	• Identifying prediction algorithms. • Selecting a suitable algorithm. • Stock Analysis Prediction on the most sold period or least soldperiod. Ensuring clean and detailed visualization over a specific period of time.
MILESTONE-VI	• Ensuring proper alert when there is a understock/overstocksituation. • Ensuring proper alert when there is a huge difference in stock prices. • Checking the algorithm's accuracy.Improvising the algorithm if needed

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	PRITHIVRS, LOKESHWARAN K
1	Confirmation	USN-2	As a user, I will receive confirmation email onceI have registered for the application	1	High	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M
1	Registration through Gmail	USN-4	As a user, I can register for the application through Gmail	2	Medium	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M
1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	PRITHIVRS, LOKESHWARAN K
2	Dashboard	USN-6	As a user, I can view my dashboard and canperform stock prediction and analysis	3	High	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M
2	View list of stocks	USN-7	As a user I can view the list of categorized products and their details	4	High	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M
2	Insights generation	USN-8	As a user, I can able to collect more insightsFrom the dash board.	2	Medium	PRITHIVRS, LOKESHWARAN K
3	Report generation	USN-9	As a user I can generate reports based onproduct sales	5	High	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Stock Prediction	USN-10	As a user I can predict out of stock and lessstock for a product	5	High	PRITHIVRS, LOKESHWARANK
Sprint-4	Notification system	USN-11	As a user I can view notification for expired andout of stock products	4	High	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M
Sprint-4	Re-Ordering stock	USN-12	As a user I can reorder stocks based on predictions and notification	3	High	PRITHIVRS, LOKESHWARANK
Sprint-2	Updating stock	USN-13	As a user I can add/delete products	5	High	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M
Sprint-4	Invoice generation	USN-14	As a user I can generate invoice calculatingtaxes, discount and calculate credits	4	High	PRITHIVRS, LOKESHWARANK
Sprint-4	Discount system	USN-15	As a user I can provide discount based on creditpoints	3	Medium	MAHARAJA ABISHEK A MAHAMMAD MUBHRAKA M

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	6	6 Days	25 Oct 2022	29 Oct 2022	6	30 Oct 2022
Sprint-2	16	6 Days	31 Oct 2022	05 Nov 2022	16	05 Nov 2022
Sprint-3	10	6 Days	07 Nov 2022	12 Nov 2022	10	12 Nov 2022
Sprint-4	14	6 Days	14 Nov 2022	20 Nov 2022	14	20 Nov 2022

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day).

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

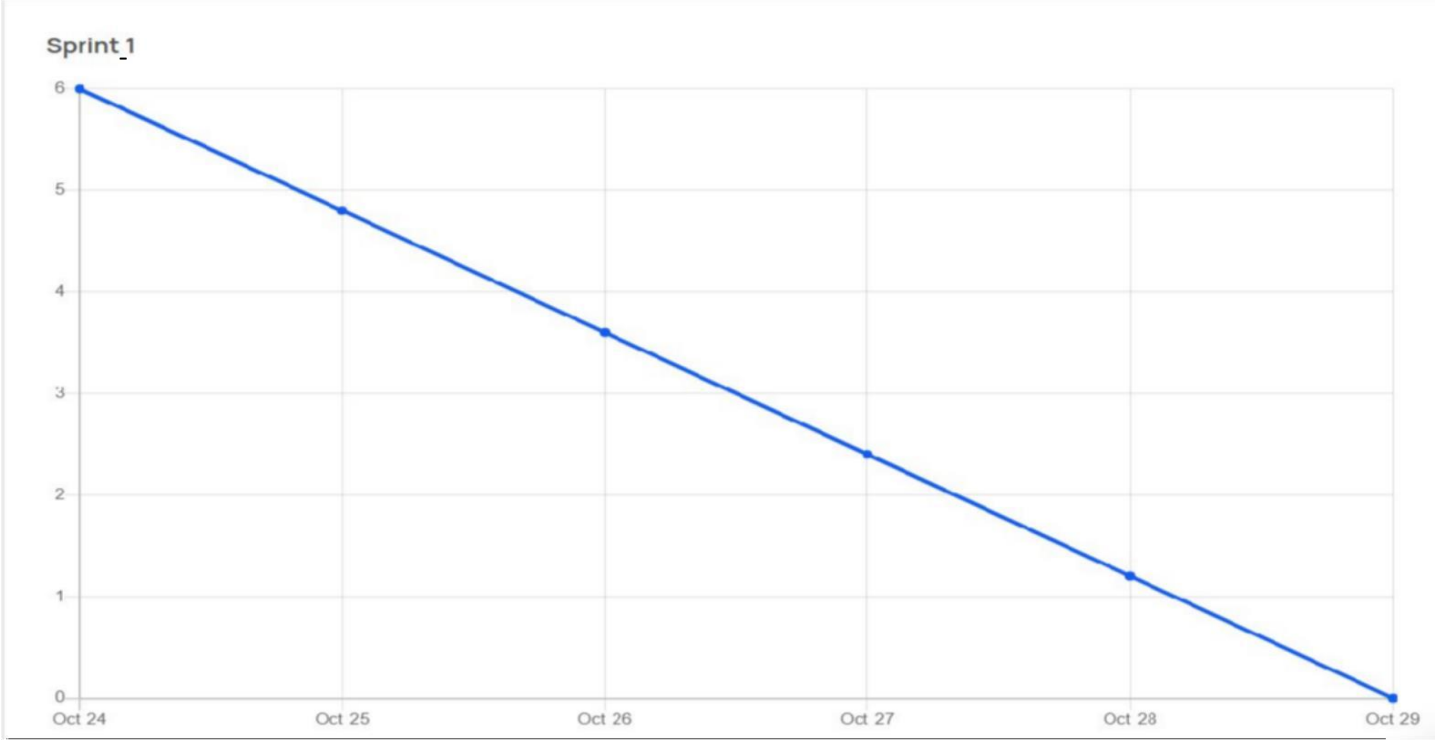
Sprint	Total Story Points	Duration	Average Velocity
Sprint-1	6	6 Days	6/6=1
Sprint-2	16	6 Days	16/6=2.67
Sprint-3	10	6 Days	10/6=1.67
Sprint-4	14	6 Days	14/6=2.33
Total	46	24	46/24=1.91

Burndown Chart:

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

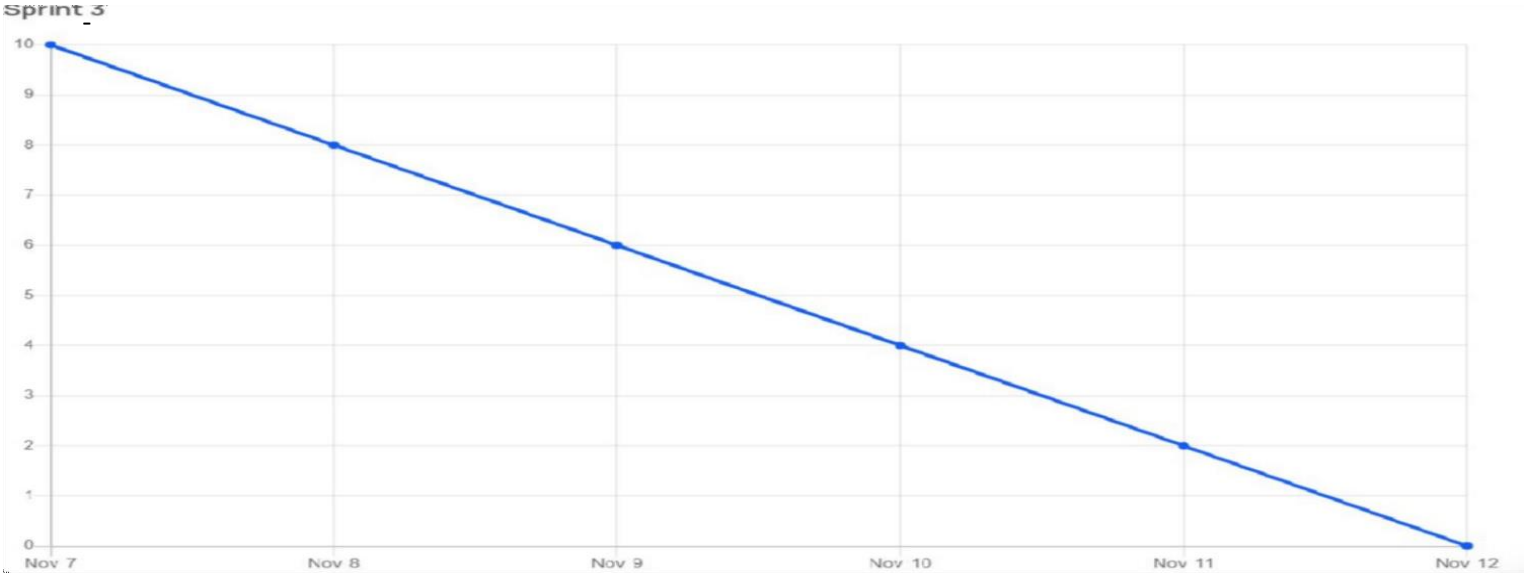
Estimated Effort:

Sprint - 1:



Sprint-2

SPRINT-3



SPRINT-4

Milestones and Activities:

MILESTONE	ACTIVITIES
Login	✓ Login into Dashboard
Dashboard	✓ Record available Stocks ✓ Perform Predictions ✓ Search Products
Visualization	✓ Report generation ✓ Out of stock prediction ✓ In stock prediction
Updating Stocks	✓ View Products ✓ Add Products ✓ Delete Products
Discount system	✓ Discounts based on credits ✓ Invoice generation
Orders	✓ Reorder Stock
Notification system	✓ Notification upon critical stock

7.SOLUTIONING AND TESTING

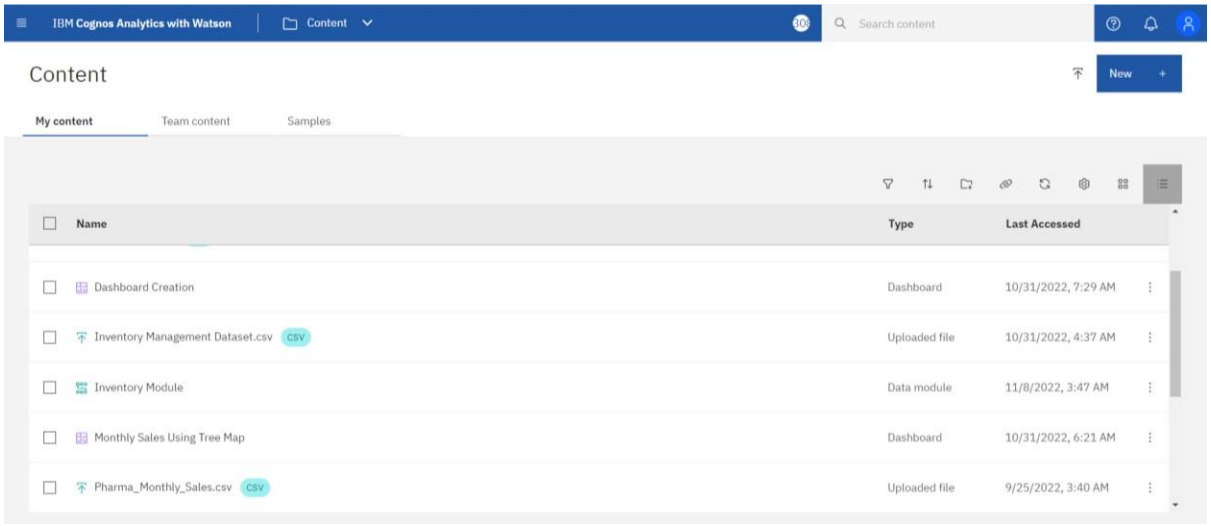
7.1 FEATURES

The major great features of the solution is that creation of an interactive analytical dashboard with less virtual noise

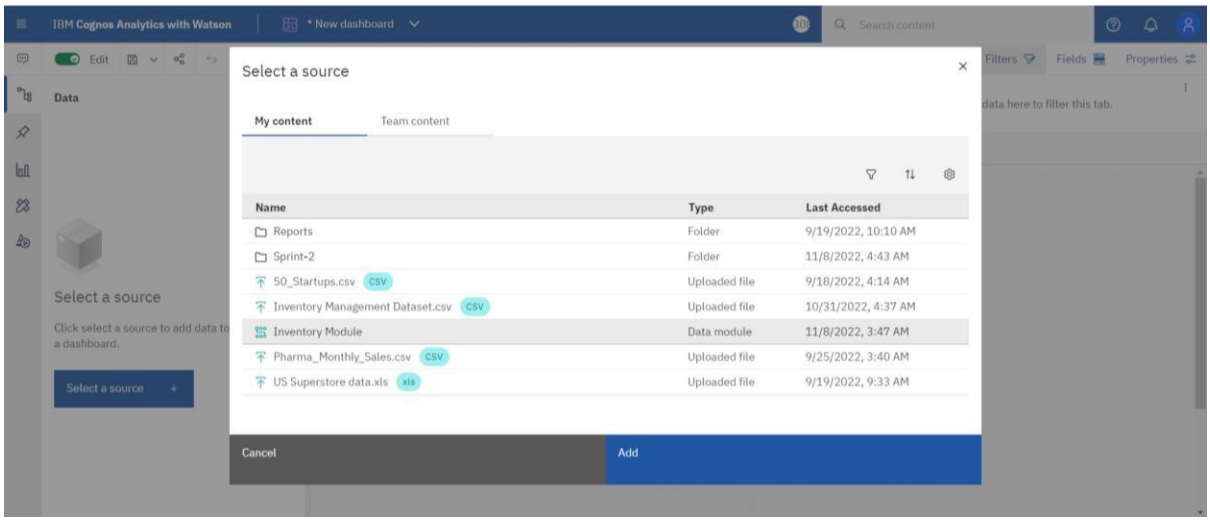
Dataset Link:

https://drive.google.com/file/d/1awFIKJ9LiIdnNHwGLcsqNDbbwshFHR-w/view

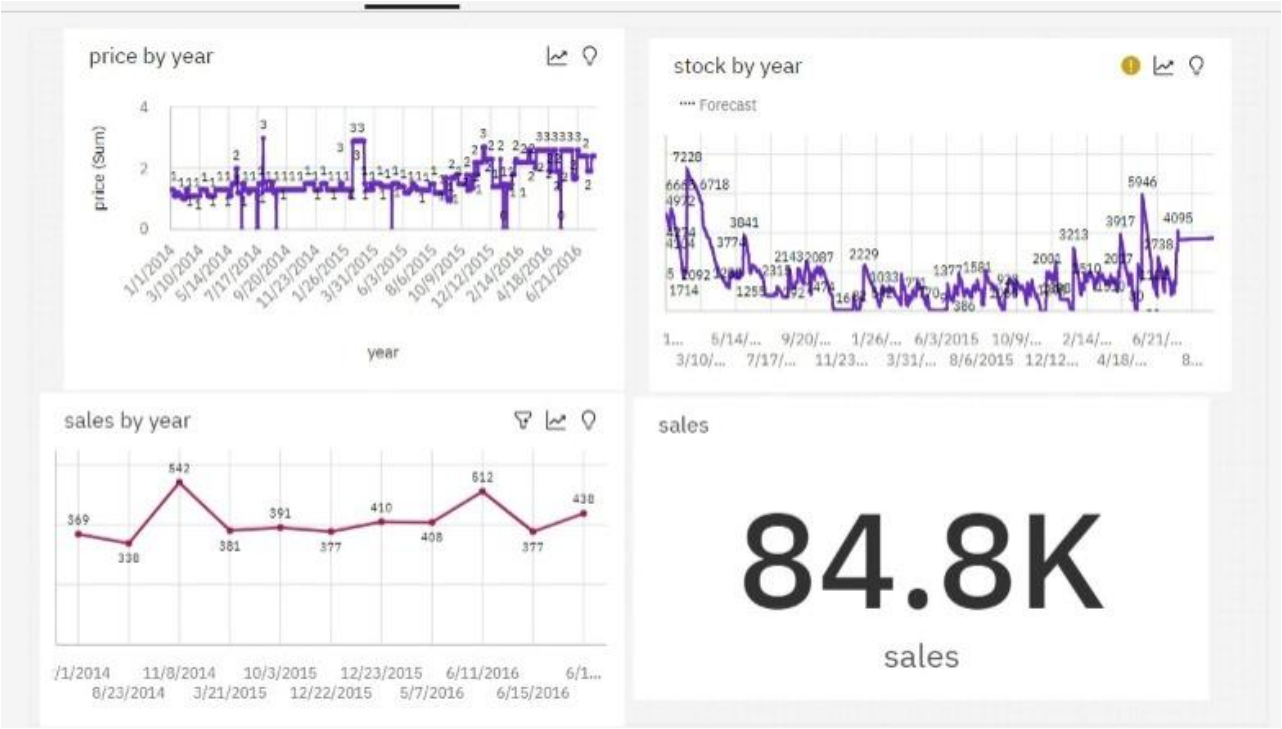
Load the Dataset:



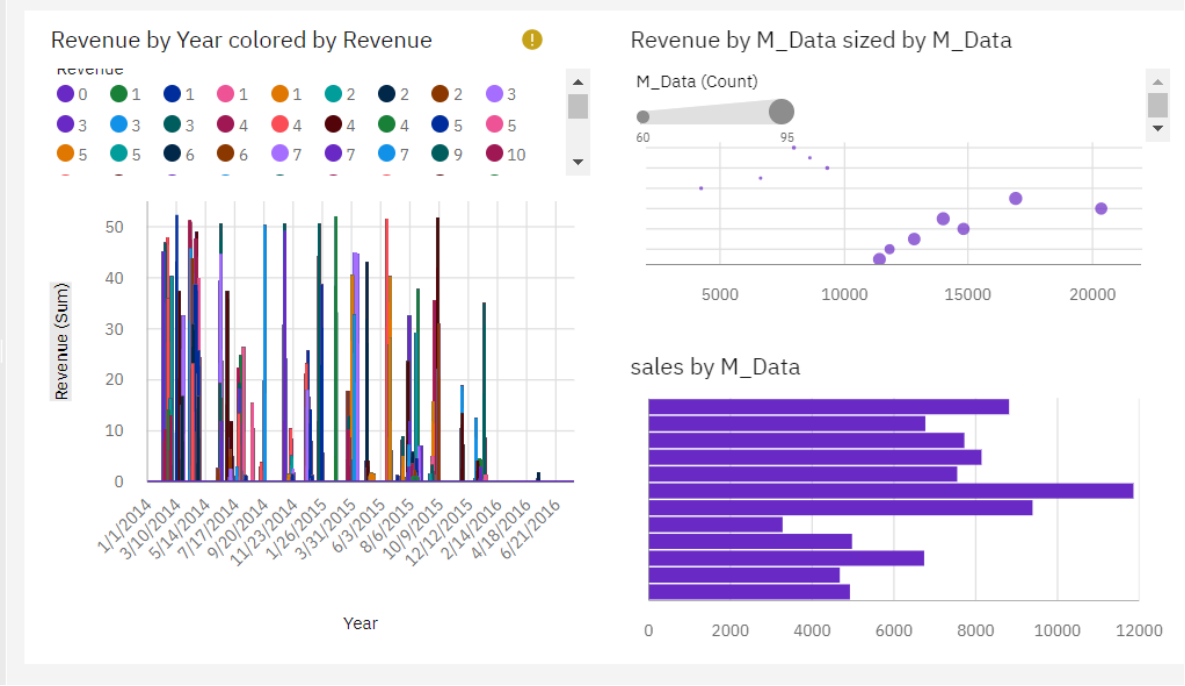
Selecting the Prepared data:



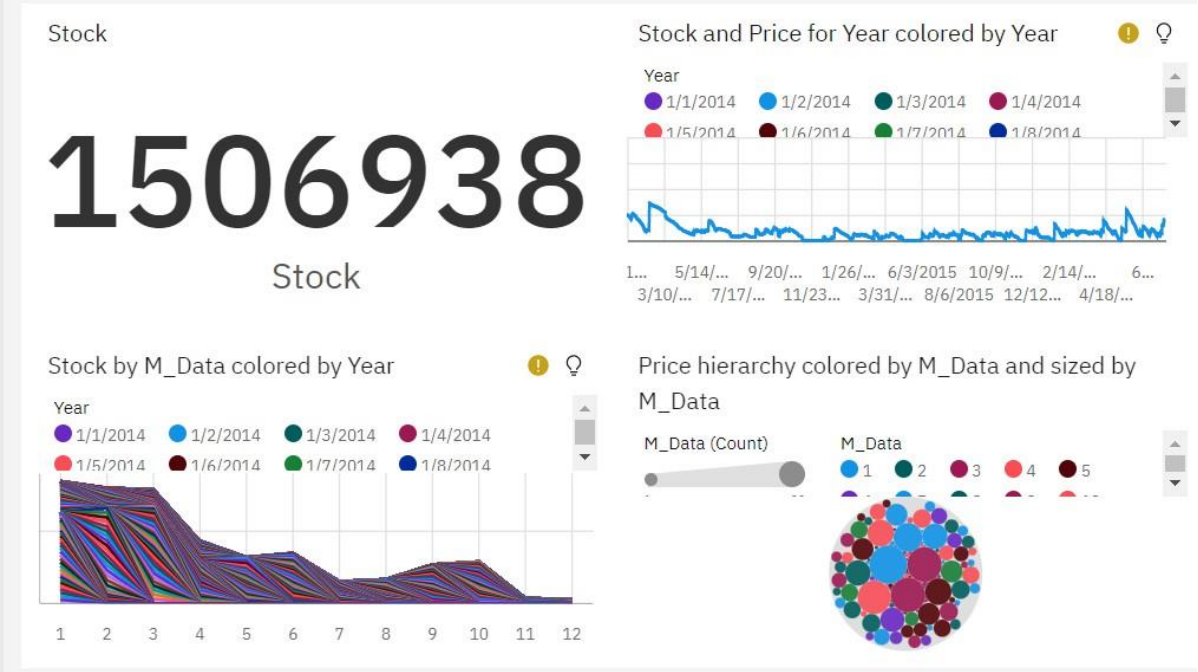
Dashboard 1:



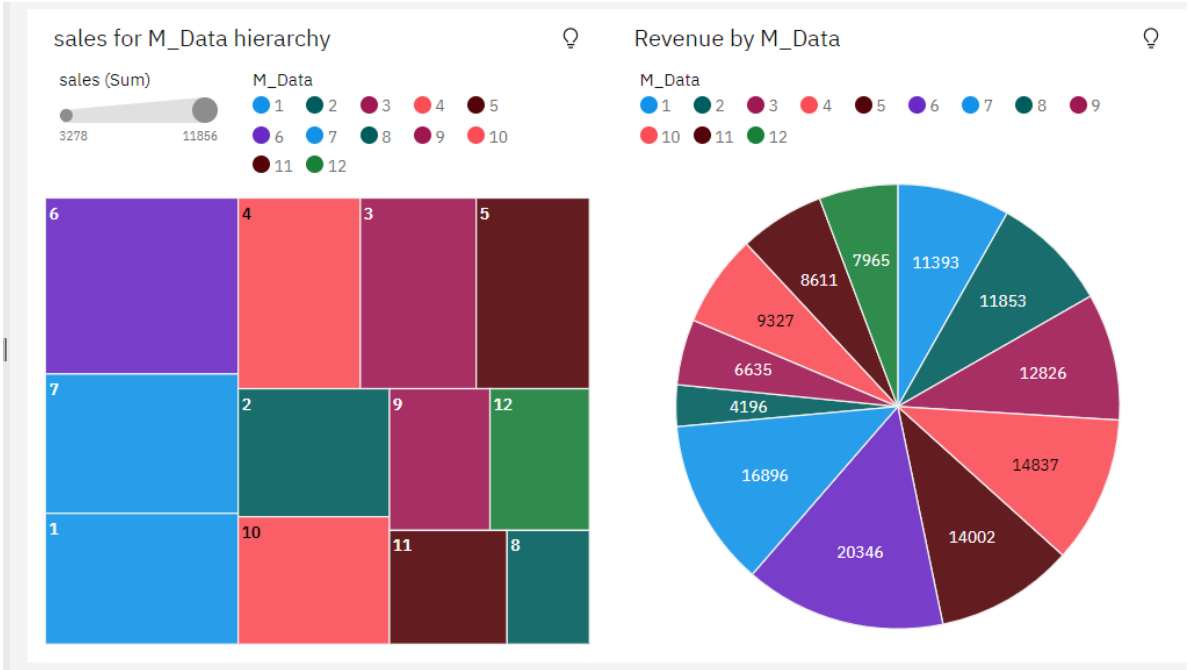
Dashboard 2:



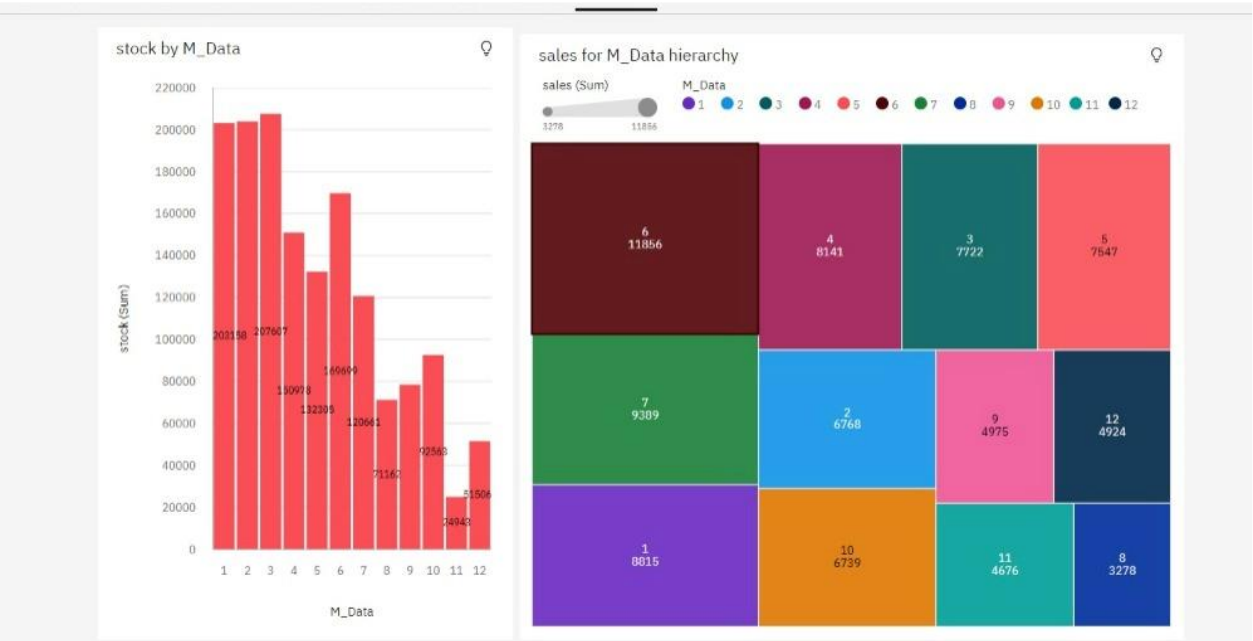
Dashboard 3:



Dashboard 4:



Dashboard 5:



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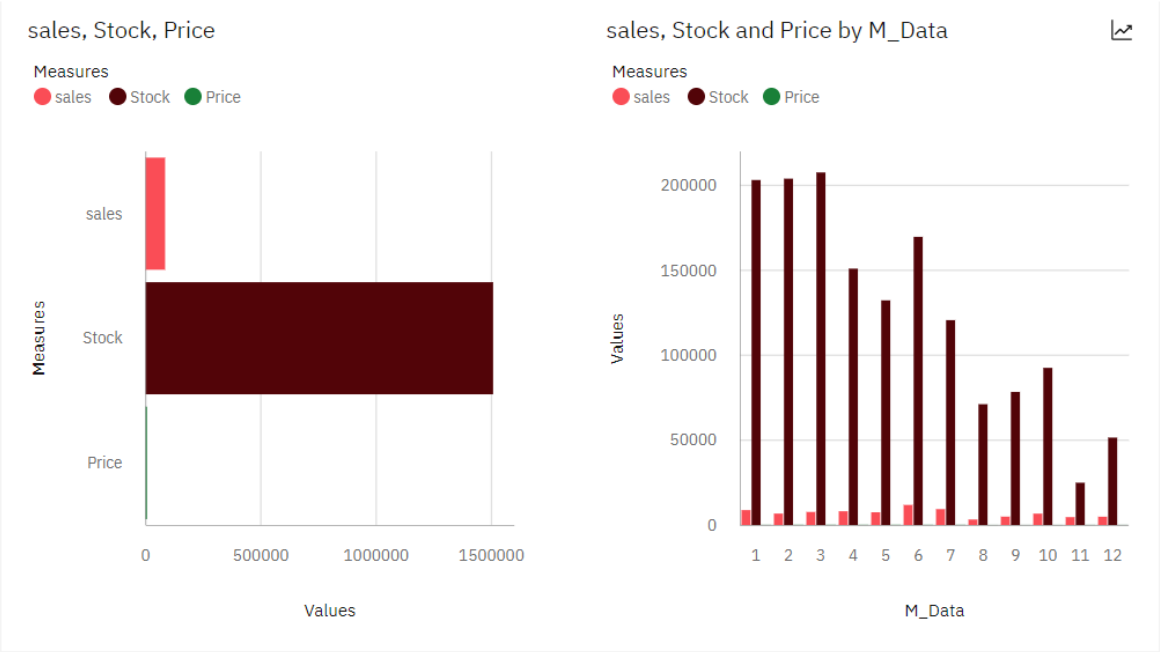

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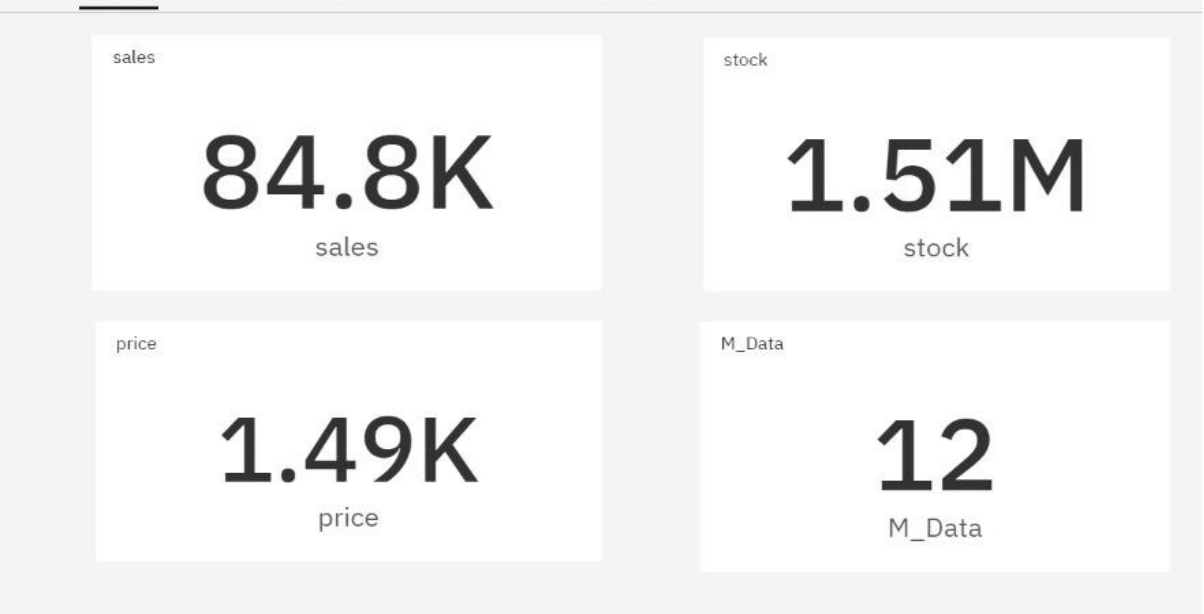

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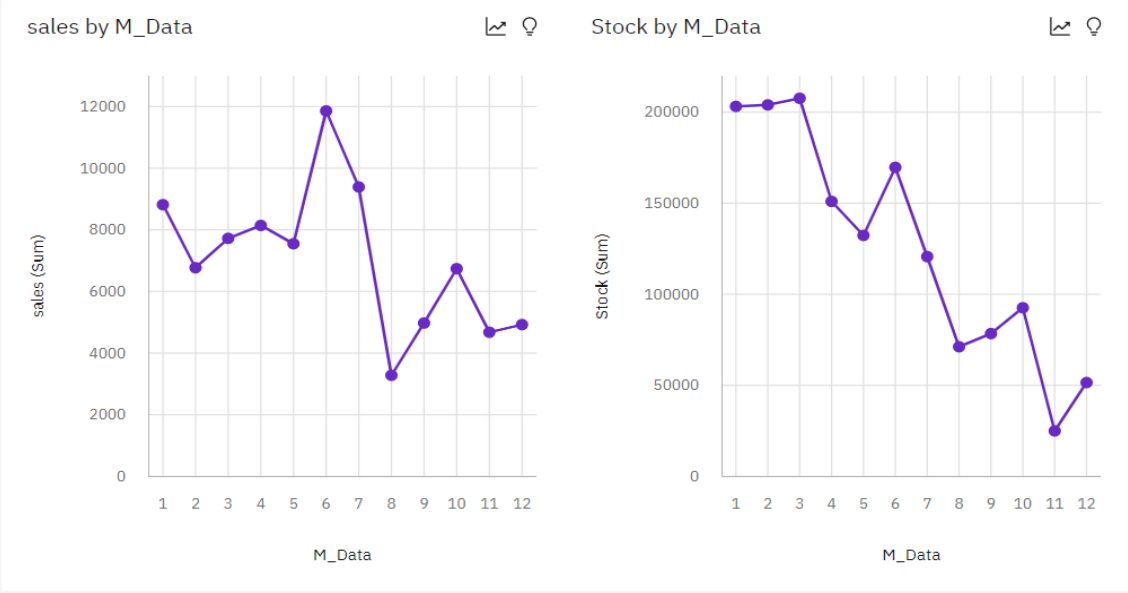


FINAL DASHBOARD LINK:

https://us3.ca.analytics.ibm.com/bi/?perspective=ca-modeller&pathRef=.my_folders%2Finventory%2Bmanagement

7.2MODEL PERFORMANCE TESTING:

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	The dashboard is created with three categoryi.e. Overview,Sales, Price.  
2.	Data Responsiveness	The data is downloaded from an external API and uploaded in the IBM cognos analytics with watson and a data module is created.
3.	Amount Data toRendered (DB2Metrics)	The dataset which is downloaded from theexternal API and uploaded is rendered from the DB2.
4.	Utilisation of DataFilters	The data filters are used for preprocessingthe data i.e cleaning ofdata , removing the null value.The unwanted columns areremoved from the dataset and the additional data which are required are addedto the dataset.

8.RESULTS

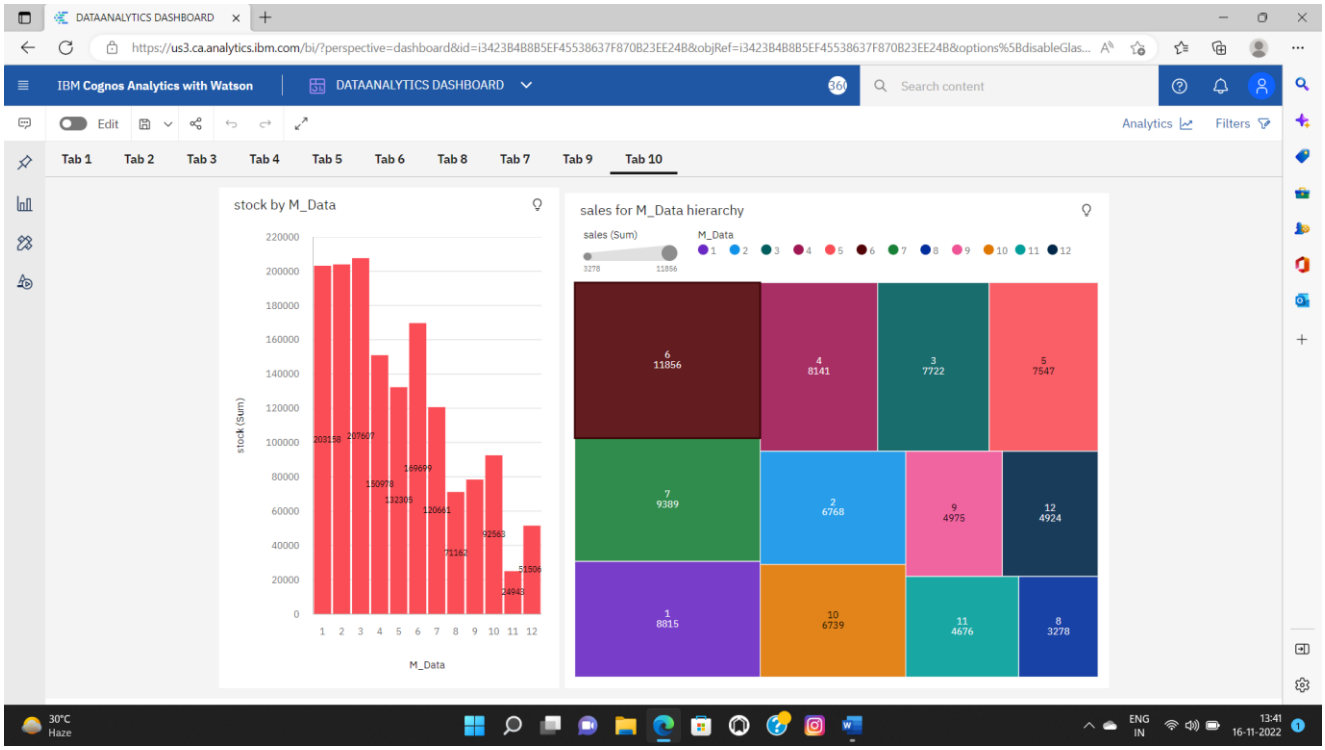
8.1 PERFORMANCE METRICS:

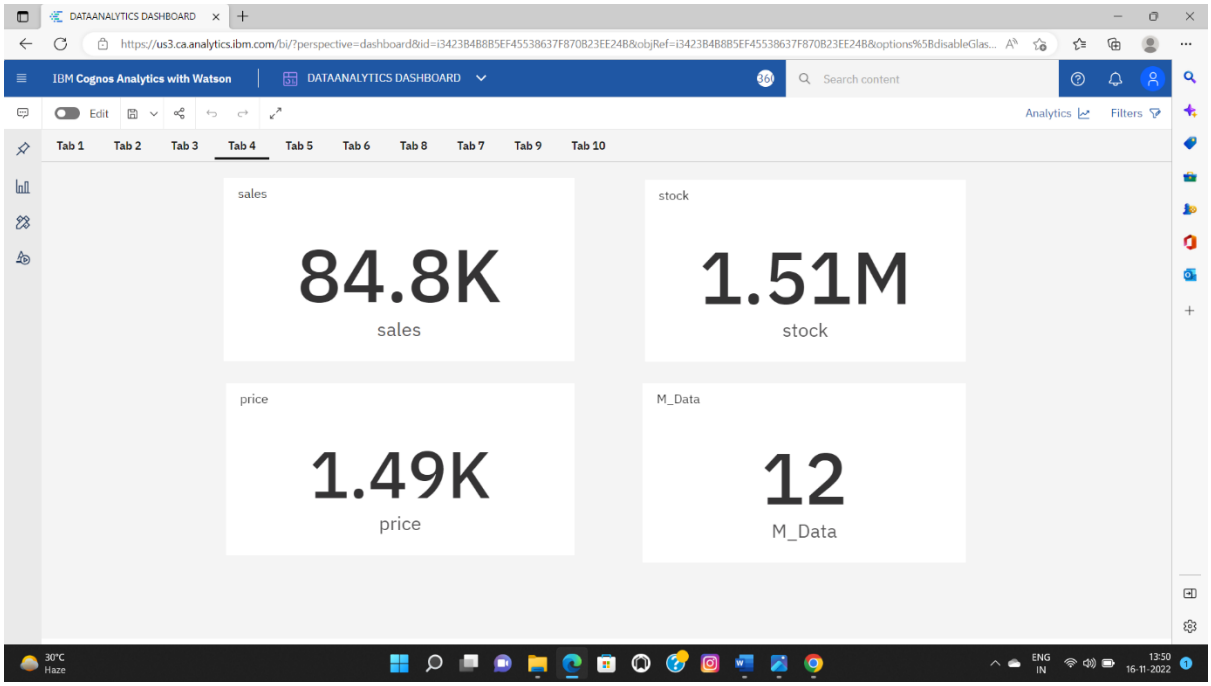
The various results has been obtained from different visualizations charts namely,

1) Year Wise Price Using Line Graph.
2) Year Wise Stock Using Line Graph.
3) Top10 Sales by Year Using Line Graph.
4) Top10 Revenue by Year Using Line Graph.
5) Monthly Stock Using Heat Map.
6) Monthly Sales Using Tree Map.
7) Monthly Revenue by Pie Chart.
8) Summary Cards of Total Revenue, Sales, Stock, Price

The results are

- ✓ The total stock came to store is 1.51M
- ✓ The total sales for stores is84.8K
- ✓ The average value of price is1.59




DATAANALYTICS DASHBOARD
IBM Cognos Analytics with Watson
DATAANALYTICS DASHBOARD
Search content
Edit
Analytics
Filters
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
Tab 8
Tab 7
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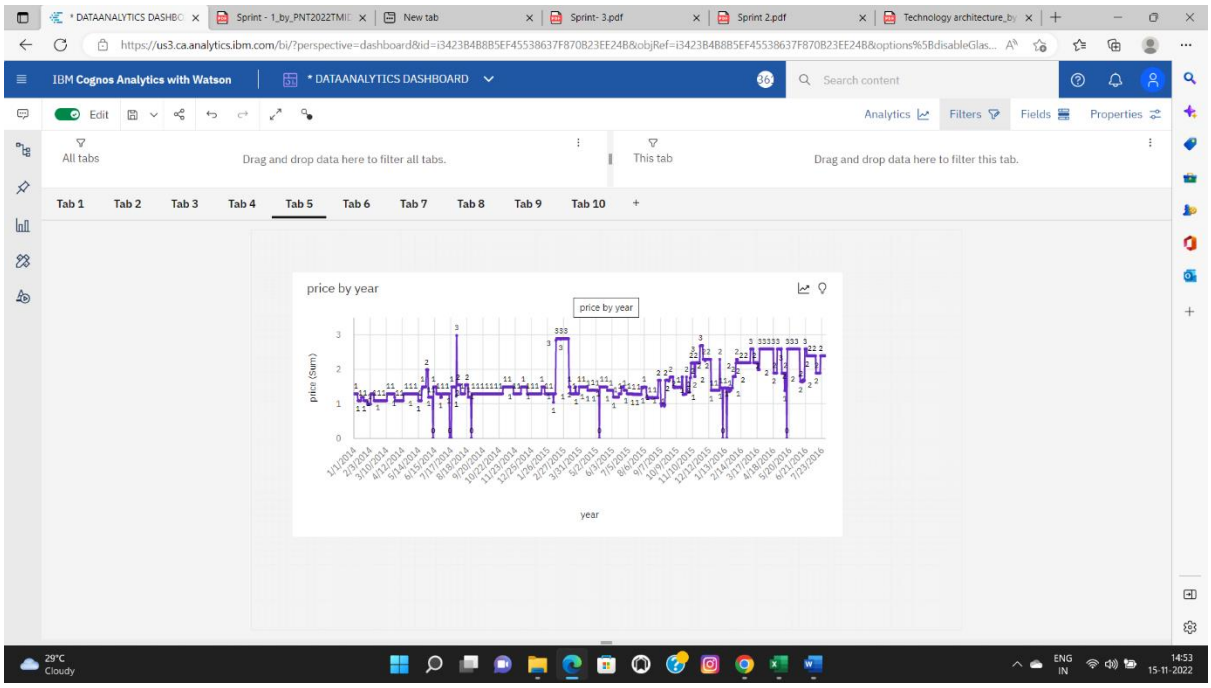
stock
1.51M
stock
price
1.49K
price
M_Data
12
M_Data


IBM Cognos Analytics with Watson
* DATAANALYTICS DASHBOARD
Search content
Edit
Analytics
Filters
Fields
Properties
All tabs
Drag and drop data here to filter all tabs.
This tab
Drag and drop data here to filter this tab.
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
Tab 7
Tab 8
Tab 9
Tab 10
price by year
price by year
price (Sum)
year

9. ADVANTAGES & DISADVANTAGES

9.1ADVANTAGES:

The major advantages of using our project retail industry will have the following benefits,

- ✓ Greater Insights: With inventory tracking and Dashboard, you can also easily spot sales trends or track recalled products or expiry dates
- ✓ Better Inventory Accuracy: With solid inventory management, you know what's in stock and order only the amount of inventory you need to meet demand.
- ✓ Reduced Risk of Overselling: Inventory management helps track what's in stock and what's on backorder, so you don't oversell products.
- ✓ Cost Savings: Stock costs money until it sells. Carrying costs include storage handling and transportation fees, insurance and employee salaries. Inventory is also at risk of theft, loss from natural disasters or obsolescence.
- ✓ Avoiding Stockouts and Excess Stock: Better planning and management helps a business minimize the number of days, if any, that an item is out of stock and avoid carrying too much inventory. Learn more about solving for stockouts in our "Essential Guide to Inventory Control."
- ✓ Better Terms with Vendors and Suppliers: Inventory management also provides insights about which products sell and in what volume. Use that knowledge as leverage to negotiate better prices and terms with suppliers.
- ✓ More Productivity: Good inventory management solutions save time that could be spent on other activities.
- ✓ Increased Profits: A better understanding of both availability and demand leads to higher inventory turnover, which leads to greater profits.
- ✓ A More Organized Warehouse: An efficient warehouse with items organized based on demand, which items are often sold together and other factors reduces labour costs and speeds order fulfilment.
- ✓ Better Customer Experience: Customers that receive what they order on time are more loyal.

9.2 DISADVANTAGE

- ✓ No Automatic services.
- ✓ Sometimes it might be complex to learn the environment quickly.
- ✓ It is an expensive type of model, for small business holders.

10.CONCLUSION

For the success of the program, the managers of the retail stores must formulate a modern way of managing the inventory by instituting electronic systems to take care of the resources of the company. This ensures that they can be accounted for and there are proper records available all the time for reference to be made when the need arises. Besides, the retail management system is necessary for ensuring that there is accountability in the way the company handles its stock. It helps in saving time. Retail companies have acquired significant importance within several countries due to their high economic contribution. Therefore, the need to analyze their KPIs becomes highly significant, as well as their different systems, methodologies, and tools used within inventory management and optimization. From the aspects mentioned above, the main trends in inventory management within companies were defined

11.FUTURE SCOPE

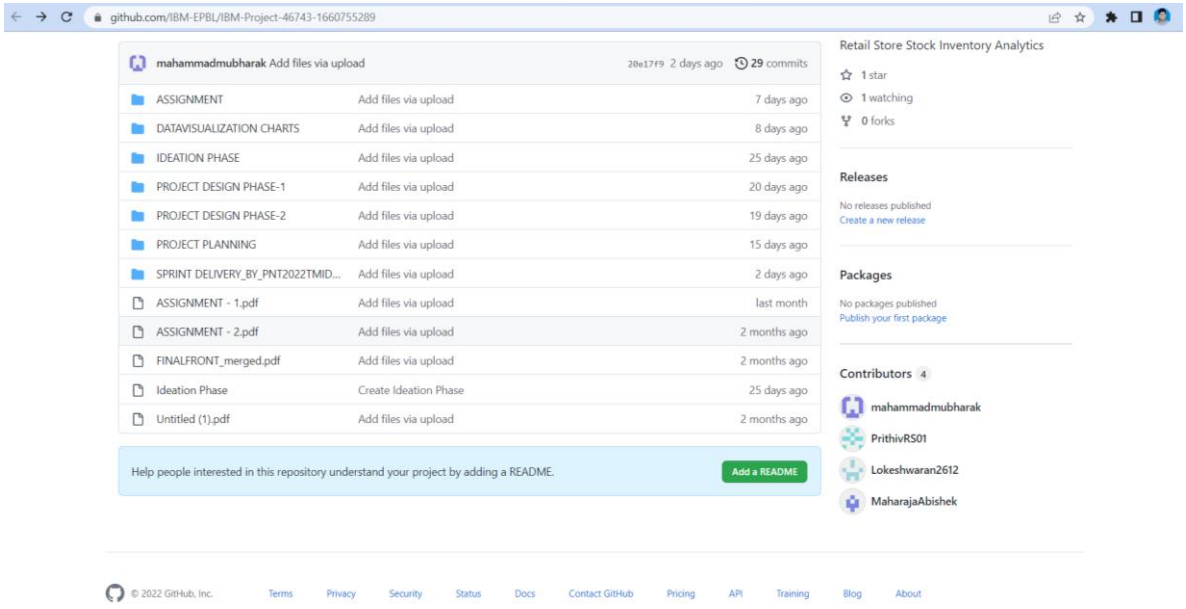
In future, this project can be useful for creating more good results.

It can act a driving force for the creation of an Automatic Dashboarding tool, which can generate accurate results within less time constraint. A dashboard with various visualizations can be very useful in gaining more insights.

12.APPENDIX

GITHUB REPOSITARY LINK:

https://github.com/IBM-EPBL/IBM-Project-46743-1660755289



DEMO LINK:

https://drive.google.com/file/d/1c18OlGh_Xq1u-kVhEa5sVgf6Y3Pys-za/view?usp=share_link