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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BACHELOR OF TECHNOLOGY

IN

INFORMATION TECHNOLOGY

PANIMALAR ENGINEERING COLLEGE

Approved by AICTE, New Delhi, Accredited with 'A' Grade by NAAC

(An Autonomous Institution, Affiliated to Anna University, Chennai)

CHENNAI – 600 123

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CHENNAI – 600 123

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ABSTRACT

Businesses that handle transactions involving consumer goods need to implement an inventory management system in order to guarantee quality control. Without legitimate stock control, a huge retail location might run unavailable on a significant thing and it's likewise simple to lose its conceivable client on the off chance that they don't have adequate stocks in the store. When it's time to reorder, a good inventory management system will notify the retailer. Additionally, an important method for automatically tracking their product's stock is an inventory management system. For instance, if a company orders ten pairs of socks for retail resale but only receives nine of them, it will be obvious when examining the package's contents and unlikely that an error occurred. Conversely, suppose a wholesaler orders 100,000 pairs of socks and discovers that 10,000 are missing. It is likely that counting each pair of socks by hand will make mistakes. An automated system for inventory management aids in reducing the likelihood of error. An Inventory Management System also aids in the tracking of retail merchandise theft in retail establishments, providing valuable information regarding storeprofits and the requirement for theft prevention systems. Every time a product is purchased or received , the store manager updates the quantity. A centralized computer system then monitors this data. In this instance, the Inventory Management System can perform a variety of tasks. It can assist in determining which products are in excess and which are understocked prior. Additionally, it provides stock reports and sales insights in the form of graphs and charts, which will make visualization easier.

Businesses can access information about inventory status in real time thanks to the coordination of all of this data. With a simple database search, inventory information can be found and analyzed in real time with Inventory Management Systems.

INTRODUCTION

Analytics is the process of finding and communicating meaningful data patterns. Analytics has moved up to the top of the corporate agenda from being discussed on the sidelines of industry and technology conferences. These tools are likely to alter the competitive landscape in many industries in the coming years with the promise of delivering performance improvements not seen since the 1990s redesign of core processes.

Non-traditional approaches to dealing with contemporary digital data are atthe heart of Big Data. We are amidst a sea of digital data. It includes data that is stored in well-organized databases that are housed in organizations, data streams that are generated by dynamic social networks, and various signals that are both tangible and understandable that are produced by a variety of digital devices all over the place. Big Data can be about figuring out the right datasets from a lot of data, which is usually defined by the three Vs: volume, velocity, and variety, making them into models that are easy to use, and afterward extricating significant bits of knowledge for concocting business procedures. Marketing and sales, research and operations, customer service, and other business functions can all benefit from these insights

Customers in the retail industry can track and gain a deeper comprehension of a wide range of data that comes from a variety of sources, including CRM, AdWords/AdSense analytics, inventory management systems, emails, transactional data, sensor data, and so on. To better channelize sales, the industry can identify current trends, reorder suppliesfor items that are selling well, adjust prices in real time, and manage and control product distribution across multiple stores. This gives the retail industry completely new perspectives on how to look at the datasets they have at their disposal. They can also use it to make better sales predictions, design relevant campaigns for their profitable customers, and ensure customer satisfaction by combining these organizational datasets with

The process of ensuring that you have products that customers want and not too few or too many is known as retail inventory management. Retailers can meet customer demand without running out of stock or carrying excess inventory by managing their inventory. Because it helps retailers increase profits, inventory management is essential.

They are more likely to have enough inventory to make every sale and avoid overstocking because having too much inventory means they have to pay forworking capital, operating costs, and a complicated business.

Based on the analysis of inventory management, they can calculate profits and losses and control how much inventory is required to sell the product. We have a lot of historical sales data for a major retailer in Brazil in our dataset.

Basic Questions of every retailer: How much inventory should I carry? Toomuch inventory means working capital costs, operational costs and a complex operation, lack of inventory leads to lost sales, unhappy customersand a damaged brand.

This is why short-term forecasting is so important in the retail and consumer goods industry.

OBJECTIVE

By the end of this Project, you will:

Know fundamental concepts and can work on IBM Cognos Analytics. Gaina broad understanding of plotting different visualization to providesuitable solution, Able to create meaningful Visualization and Dashboard(s).

Primary objective:

1. Identifying Consumer Demands:

Finding out what a customer wants and needs is a retailer's first responsibility. The retailer sells finished goods and services that are ready-to-use and desired by customers rather than raw materials.

As a result, retailers periodically collect information about customers' tastes, preferences, likes, and dislikes.

2. Management of Merchandise:

The second task that a retailer performs is the management of merchandise. The retailer performs the function of storing the merchandise and provides as and when required by the customer.

3. Convenience of timing:

By keeping the store open and ready for sale at customers' convenience, the retailer creates time utility. Over one in ten people now work outside of normal hours, which is reflected in the new retailing trend of longer trade hours. This is a solution for small retailers to compete with the lower prices offered by superstores and other retail chains.

A retailer creates place utility by being present at a location that is convenient to shopand easy to access. Lastly, when customers choose to buy something,

So, retailers are not just the last connection between the shoppers and the makers however a crucial piece of current business world. Imagine how difficult and costly it would be for a consumer to approach a manufacturer for every item he desires if retailing were not available. Rather than selling things in small quantities, retailers make shopping easier and less risky.

Retailers employ floor staff to answer customers' questions about how to use their products safely and effectively, advise them on what to buy based on their preferences and budgets, and demonstrate or display products so that customers can get a feel for them before making a purchase. Through effective marketing, the successful retailer focuses its activities on achieving these goals.

Retail Sales Goals:

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 tosupport and merge into long term goals.

3. Ideation Phase

3.1 LITERATURE SURVEY

1. Inventory management in retail industry - Application of big data analytics
   Author : Hien Vu

https://www.researchgate.net/publication/329526158_Inventory_management_in_retail_industry__Application_of_big_data_analytics

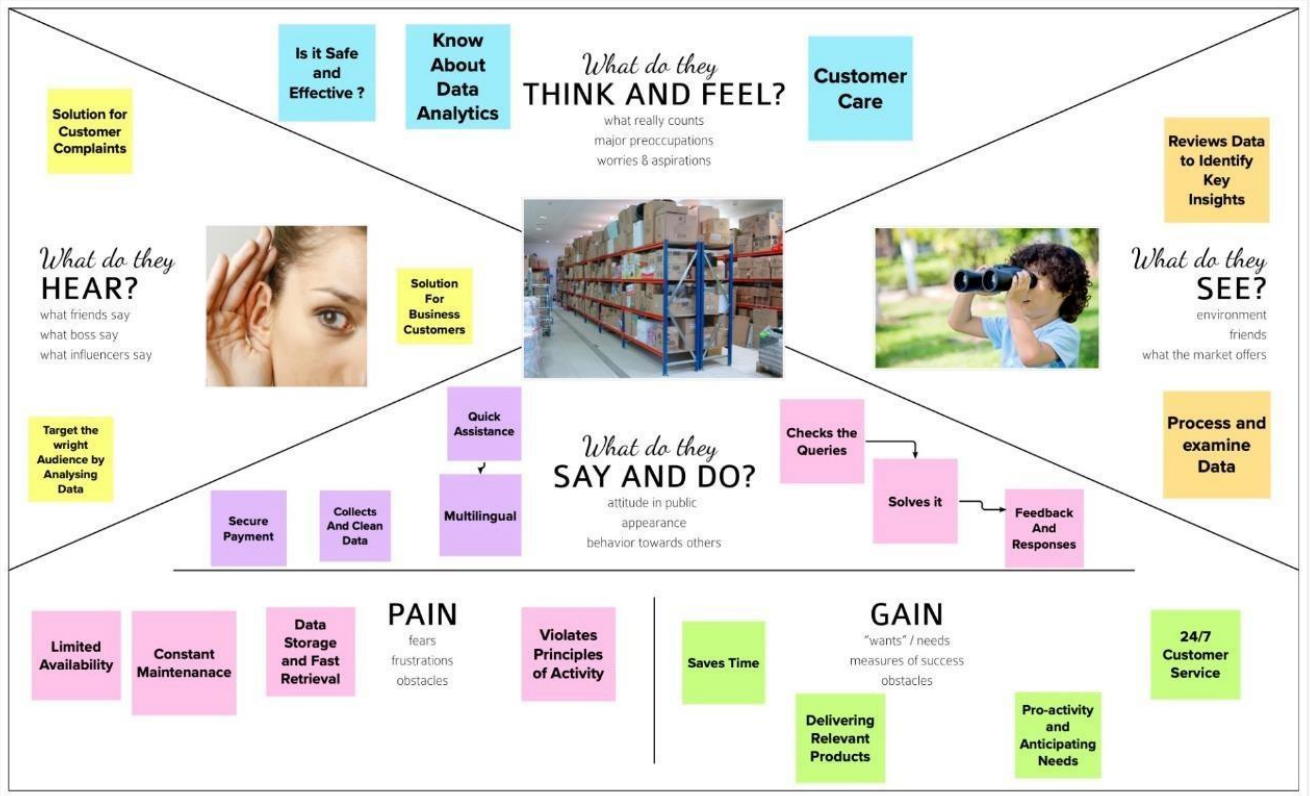
Retailers are faced with a dilemma where neither an excess of inventory on hand nor a running out of stock is negotiable as the retail sectorbecomes increasingly highly competitive and narrowly profitable. A thorough analysis of important inventory management strategies that have historically been employed by retailers on a large scale. The trade-off between shortage cost and overage cost is identified in the paper as the fundamental issue with inventory management. Once more, the "performance frontier" graph shows that introducing innovative is a practical way to change the efficiency curve. BDA is that innovative in thisscenario. The research identifies opportunities for incorporating BDA into traditional inventory management methods and boosting the applicability and feasibility ofthese models in the big-data environment.

2. Retail company inventory management: A review of the literature and currenttrends
Author:1. Cinthya Vanessa Munoz, Rodrigo Arcentales -Carrion, Jorge Andres Espinoza Aguirre, and Mario Pena

https://www.researchgate.net/publication/352235223_Inventory_management_for_retail_campany_A_literature_review_and_current_trends To identify the primary trends and indicators of inventory management inSmall and Mediumsized Enterprises, a systematic literature study wasconducted (SMEs). The five-year

study period between 2015 and 2019mainly focuses on the retail industry. The main findings of this studyinclude the top inventory control and management models, the KeyPerformance Indicators (KPIs) for managing them correctly, and theadvantages and difficulties of selecting or implementing an effectivesystem

3.2 EMPATHY MAP

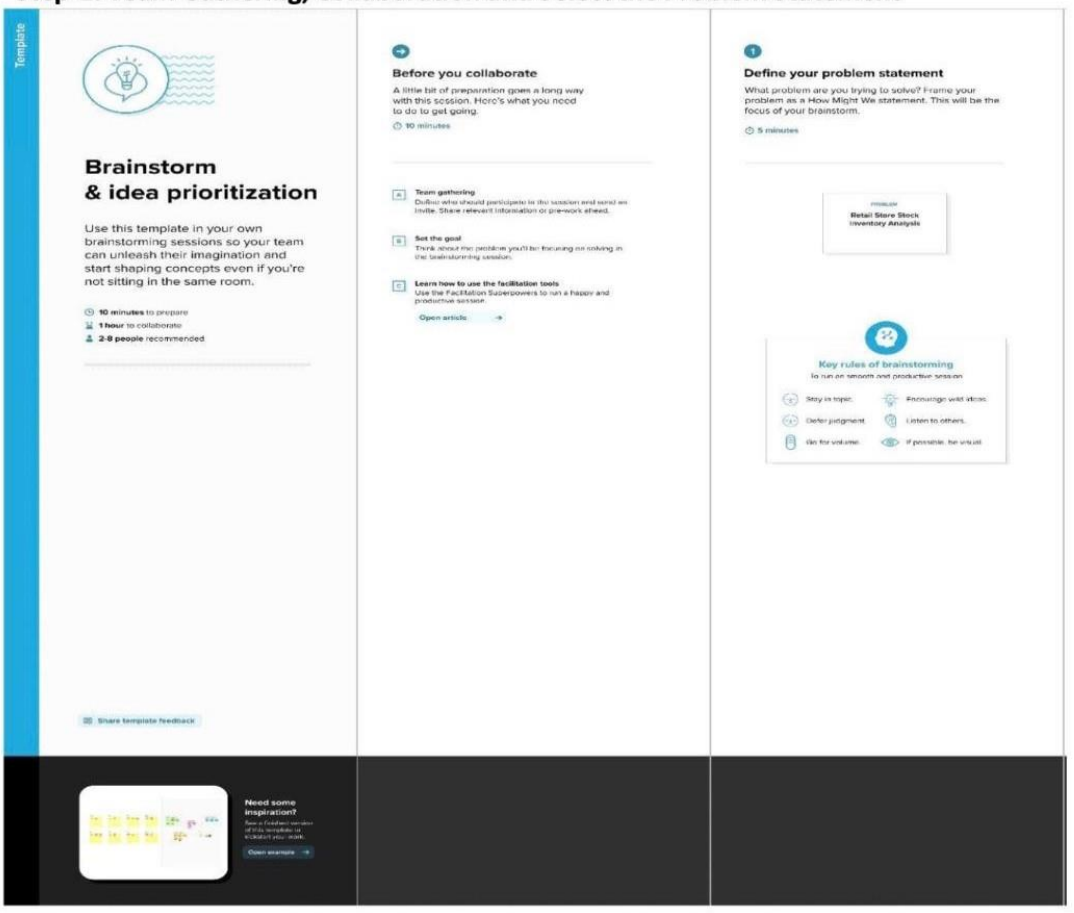


3.3 IDEATION PHASE

Step 1:

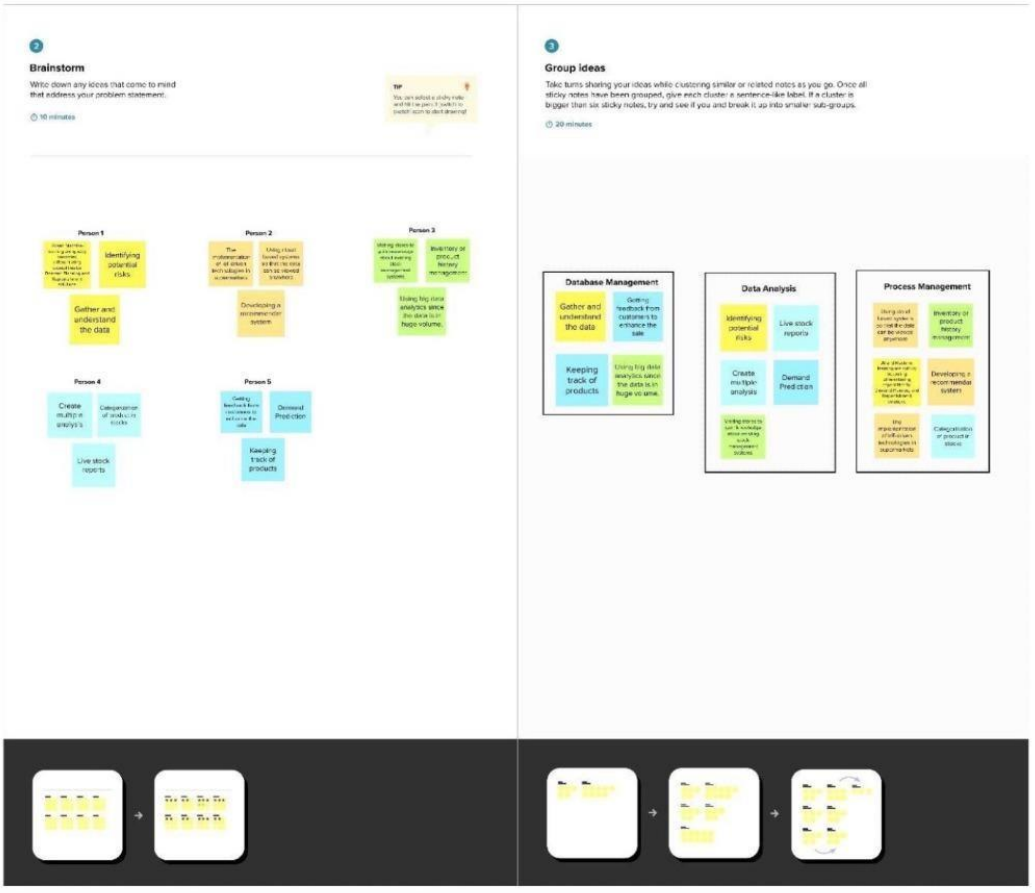
Brainstorm & Idea Prioritization:

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



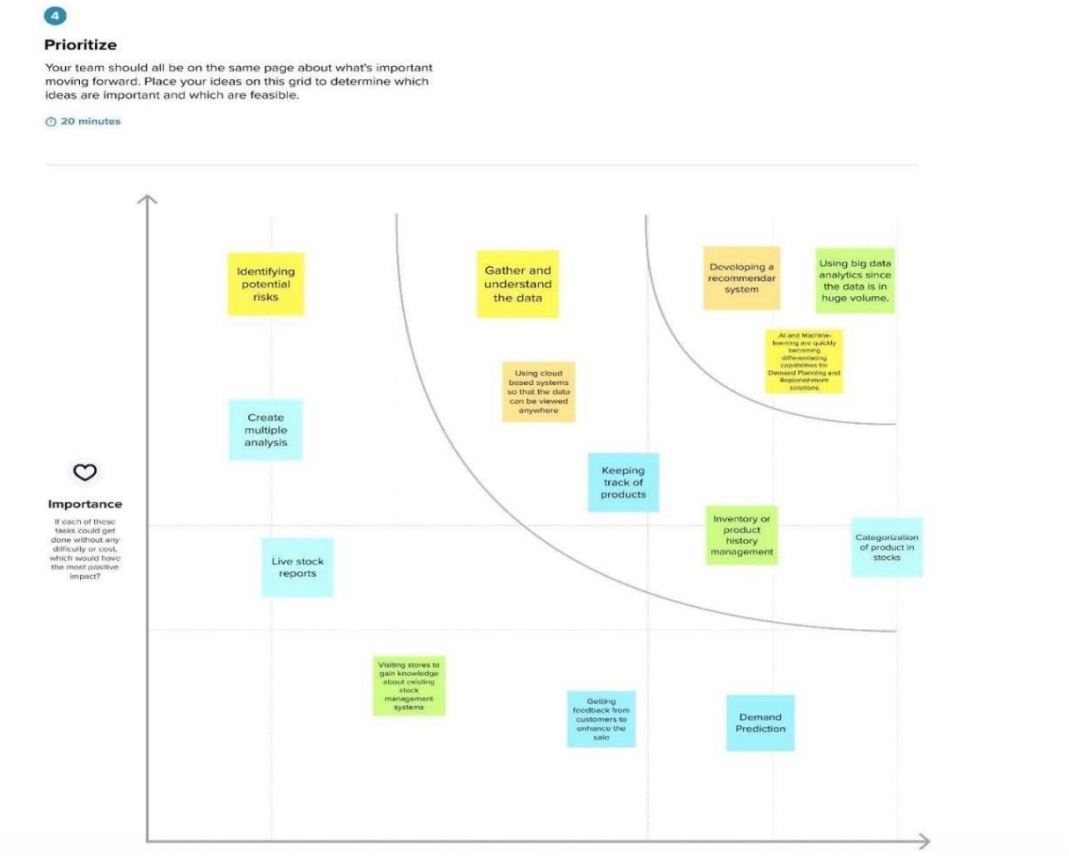
Step 2:

Step-2: Brainstorm, Idea Listing and Grouping



Step 3:

Step 3: Idea Prioritization

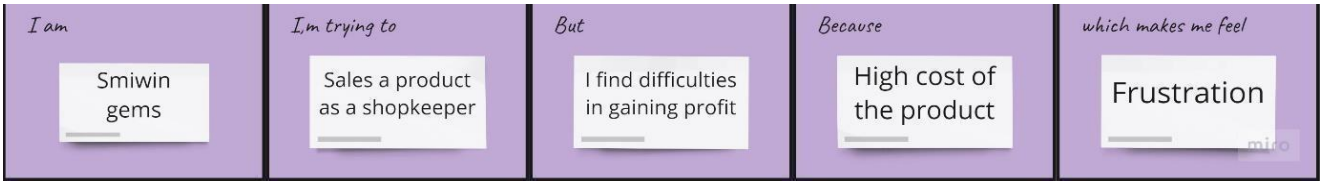


3.4 PROBLEM STATEMENT

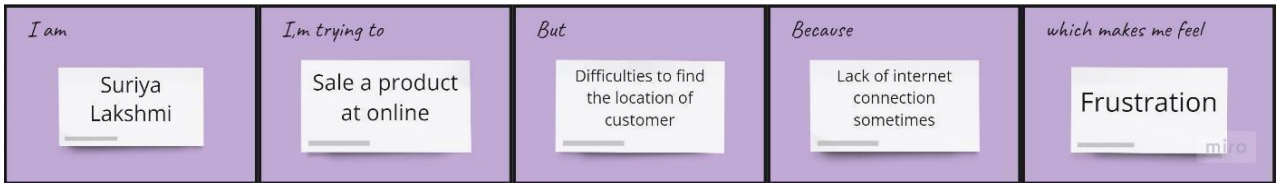
Problem Statement 1:

Problem statement 2:

Problem statement 3:



Problem statement 4:



4.PROJECT DESIGN PHASE 1

4.1 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The company's issue is that they don't have a structured system in place to track and maintain their inventory data. Because they only retain the inventory data in the logbook and are not properly organized, the admin finds it challenging to record the data promptly and safely.
2.	Idea / Solution description	Upgrade to software that offers automated functions, such as IBM cloud and Cognos analytics with Watson.
3.	Novelty / Uniqueness	Because they are based on the number of users and data storage usage, cloud-based and Software as a Service (SaaS) inventory analysis has become more affordable than on-premise implementations and supported systems.
4.	Social Impact / Customer Satisfaction	People can easily analyse, prepare, and visualize data using this software, and provide the best solution.
5.	Business Model (Revenue Model)	Having the right amount of inventory on hand to increase sales while decreasing expenses will boost profits.
6.	Scalability of the Solution	This software is compatible with a variety of platforms, including Windows, Mac, and Linux, and it can easily analyse various types of data.

4.2 PROBLEM SOLUTION FIT

4.3 SOLUTION ARCHITECTURE

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

Example - Solution Architecture Diagram:

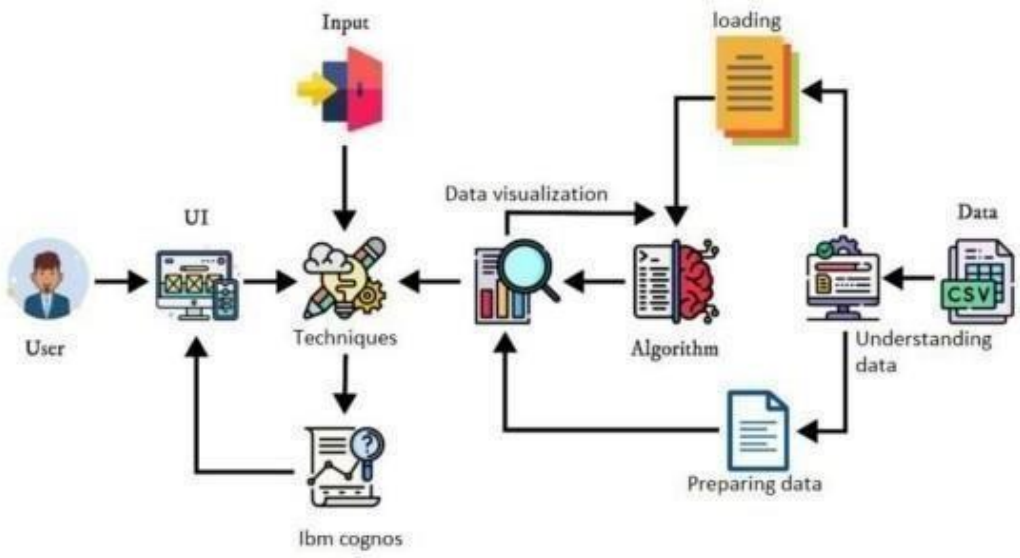


Figure 1: Architecture and data flow of the voice patient diary sample application

Reference: https://aws.amazon.com/blogs/industries/voice-applications-in-clinical-researchpowered-by-ai-o n-aws-part-1-architecture-and-design-considerations/

5. PROJECT DESIGN PHASE 2

5.1CUSTOMER JOURNEY MAP

5.2 SOLUTION REQUIREMENTS

Following are the functional/Solution requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login	Login with username Login with password
FR-4	Profile update	Update the user credentials Update the Contact details
FR-5	Uploading Data	Collect the customer details as well as product details Upload the product details This model predicts the best sold products and also it analysis the available stocks
FR-6	Recommendation	User will request for Item Get the Item recommendations
FR-7	Ratings and Reviews	The user i.e retailer of any shop can give their ratings and view of this models

Non-functional Requirements:

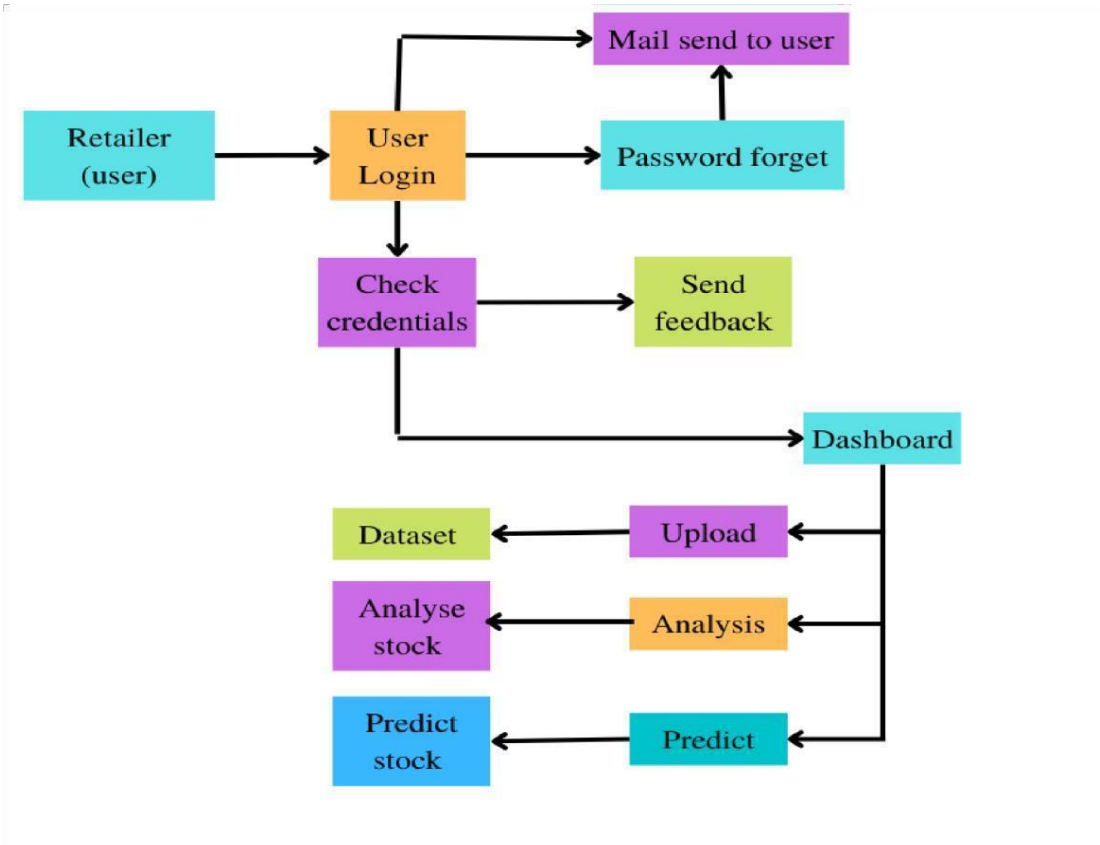
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	They are more likely to have enough inventory to capture every possible sale while avoiding overstock and minimizing expenses.
NFR-2	**Security**	This can be used only by the users who have their proper login credentials
NFR-3	**Reliability**	Avoid over or understocking Ensure accurate inventory valuationPrevent order delays Reduce dead stock
NFR-4	**Performance**	From this, the model can predict the dead stocks and highly profitable stocks. The accuracy of this model will be ensured by checking multiple times.
NFR-5	**Availability**	This model is suitable for all kinds of retail stores. It can give retailers real-time visibility into stock levels, avoid stockouts, keep inventory carrying costs low and help meet customer expectations
NFR-6	**Scalability**	More 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.

5.3 DATA FLOW DIAGRAM

Data Flow Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the web application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, after completing the registration I will receive confirmation email once I have registered for the web application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the web application through LinkedIn	I can register & access the dashboard with LinkedIn Login	Low	Sprint-2
		USN-4	As a user, I can register for the web application through Google account	I can register & access the dashboard with Gmail login	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password after installing the web application	I can access the dashboard by login into the application	High	Sprint-1
	Dashboard	USN-6	As a user, I can view the charts and graphs representation of the dataset and the information shown in the dashboard	I can analyse the stocks in my retail store.	High	Sprint-1
Customer (Web user)		USN-1	As a user, I can register for the web application entering my email, password,confirming my password.	I can access my account / dashboard	High	Sprint-1
Customer Care Executive		USN-2	As a user, after completing the registration I will receive confirmation email once I have registered for the web application	I can receive confirmation email & click confirm	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Administrator		USN-3	As a user, I can register for the web application through LinkedIn	I can register & access the dashboard with LinkedIn Login	Low	Sprint-2
		USN-4	As a user, I can register for the web application through Google account	I can register & access the dashboard with Gmail login	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the web application by entering email & password after installing the application.	I can access the dashboard by login into the application	High	Sprint-1
	Dashboard	USN-6	As a user, I can view the charts and graphs representation of the dataset and the information shown in the dashboard.	I can analyse the stocks in my retail store.	High	Sprint-1
Customer Care Executive		CCE-1	As a customer care executive, I will always be 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 backup and 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 updating and maintaining the data.	High	Sprint-2

5.4 TECHNOLOGY STACK

Technical Architecture:

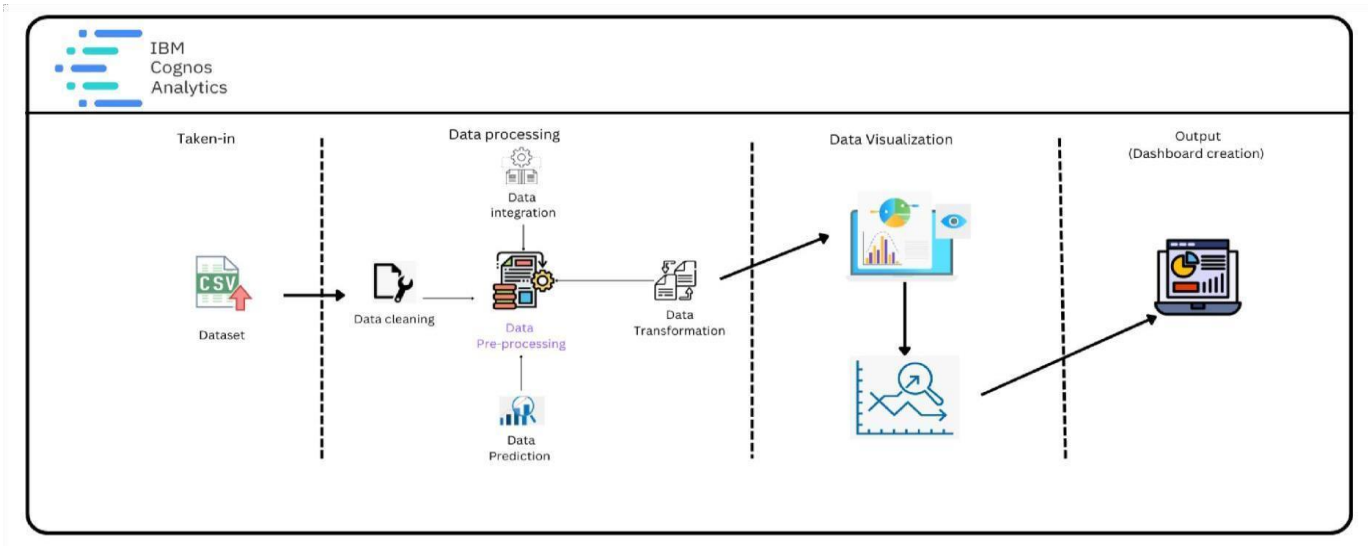


Table-1 : Components & Technologies:

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 in store.	ML algorithms – Logistic Regression, Linear Regression, Random Forest,ABC.

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	Encryptions
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

6.Project planning phase

6.1 PREPARE MILESTONE AND ACTIVITY LIST

MILESTONES AND ACTIVITIES:

MILESTONES	ACTIVITIES
Login	• Login
Category	• Add Category • Update Category • Delete Category
Products	• Add Product • Update Product • Delete Product • View Product
Employee	• Login • Add Employee • Update Employee • Delete Employee
Visualization	• View Summary • View Bills • View Profile • View Summary • View Bills
Orders	• Order Product - Retailer • Add Daily Purchase - Retailer • Order Product - Employee • Add Daily Purchase - Employee
Notify	• Notify on critical stock

6.2 SPRINT DELIVERY PLAN

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	10	High	
Sprint-1	Data uploading	USN-2	As a user, I will be uploading mydata intothe Cognos analytics	10	High	Tharun Kumar T

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Data Analysis	USN-3	As a user, I will be performing analysis onthe data for making predictions	5	High	Hemnath V
Sprint-2	Dashboards	USN-4	As a user, I will be making visualizationsand interactive dashboards from the data	10	High	Hemnath V
Sprint-3	Story	USN-5	As a user, I will be making stories from thedata and the dashboards	20	High	Yogesh Y
Sprint-4	Report	USN-6	As a user, I will be making a report from theanalysis and dashboards	20	High	Rakshan Raj J

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

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint EndDate (Planned)	Story Points Completed (ason Planned End Date)
Sprint -1	20	6 Days	24 Oct 2022	29 Oct 2022	20
Sprint -2	20	6 Days	31 Oct 2022	05 Nov 2022	20
Sprint -3	20	6 Days	07 Nov 2022	12 Nov 2022	20
Sprint -4	20	6 Days	14 Nov 2022	19 Nov 2022	20

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)

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

7.PROJECT DEVELOPMENT PHASE

7.1 DELIVERY OF SPRINT 1

Project Development Phase:

Sprint-1:

➢ Data Collection ➢ Data Preparation **Sprint-2:**

➢ Data Exploration **Sprint-3:**

➢ Dashboard Creation **Sprint-4:**

➢ Report Creation

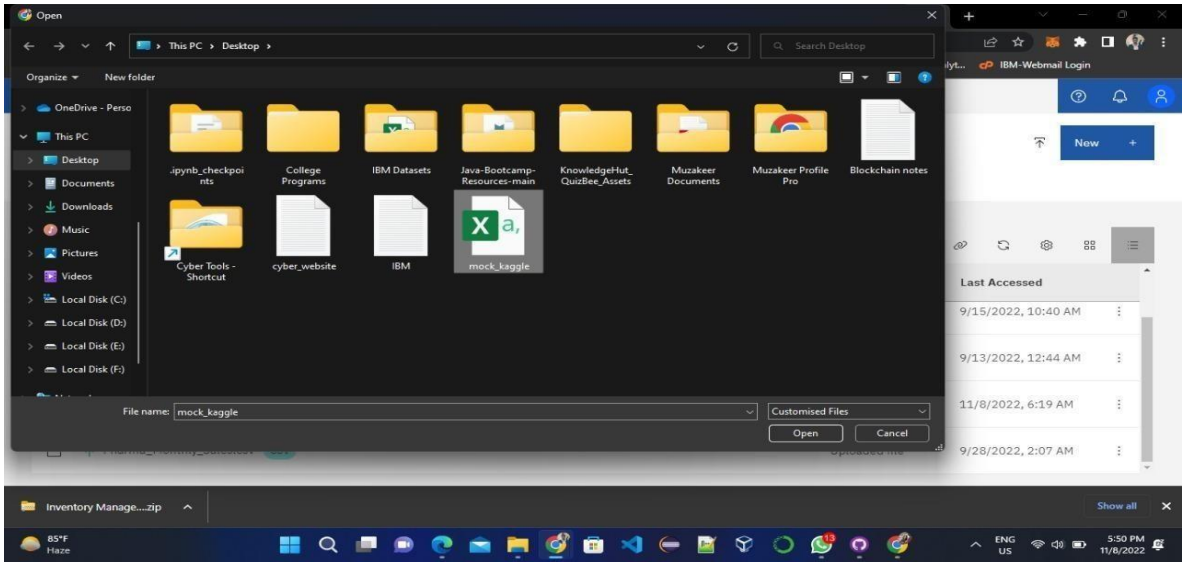
➢ Story Creation

Sprint-1:

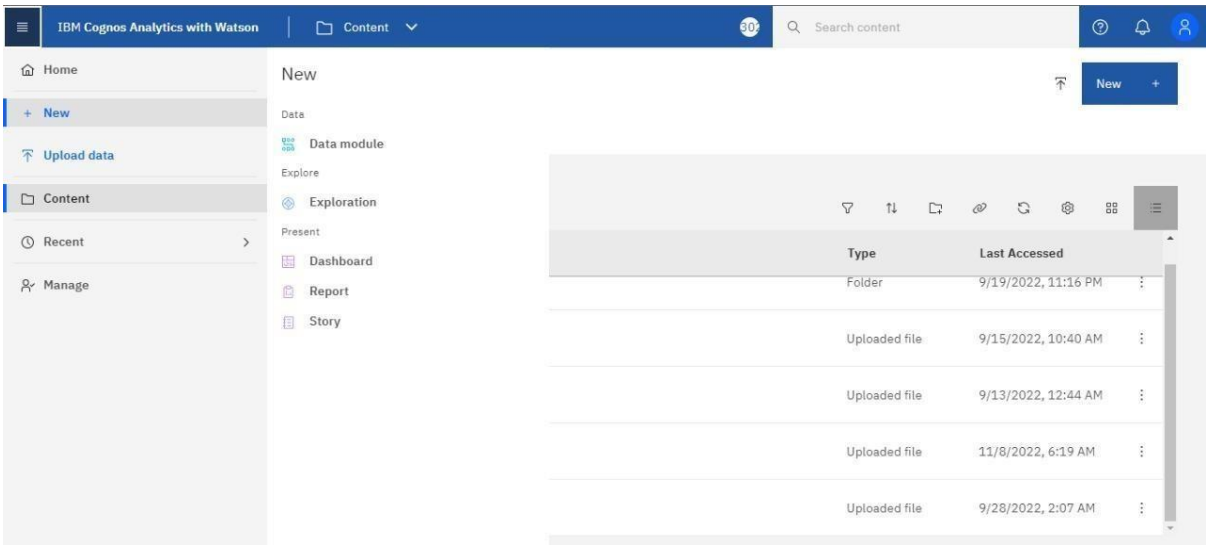
Data Collection:

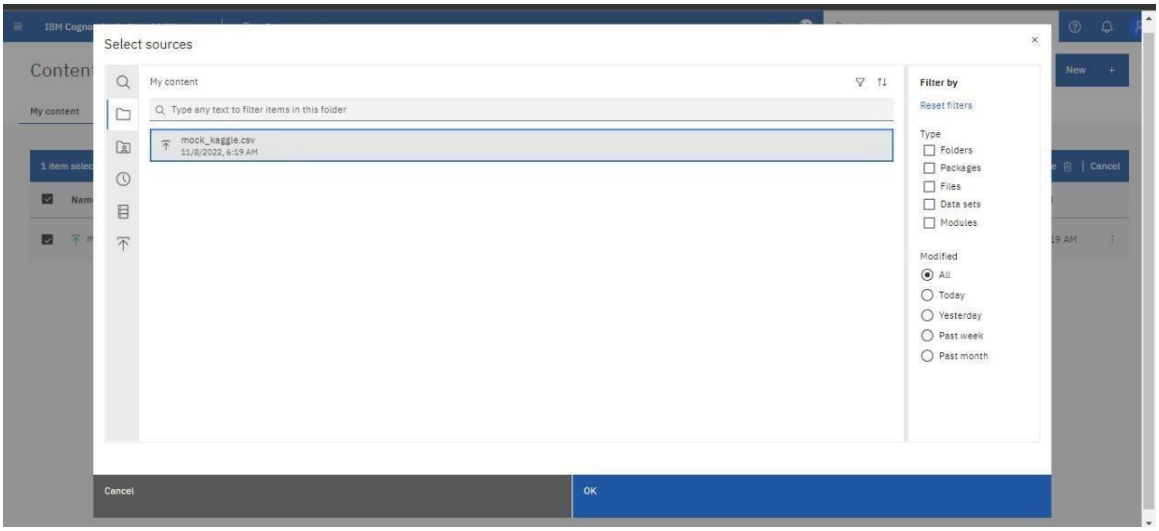
Download

Uploading the data:

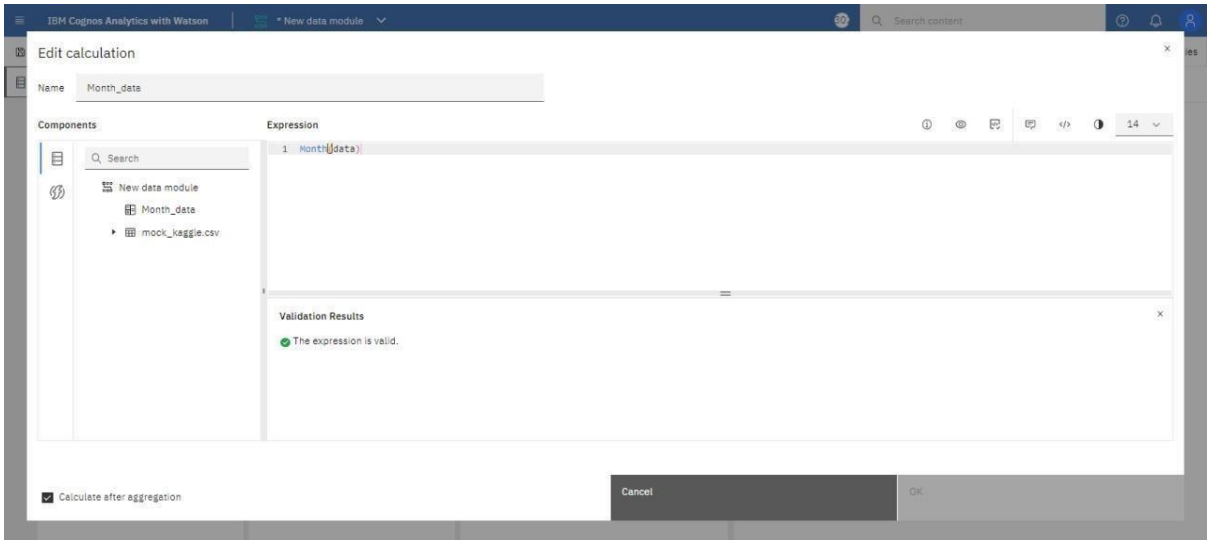


Creating data module

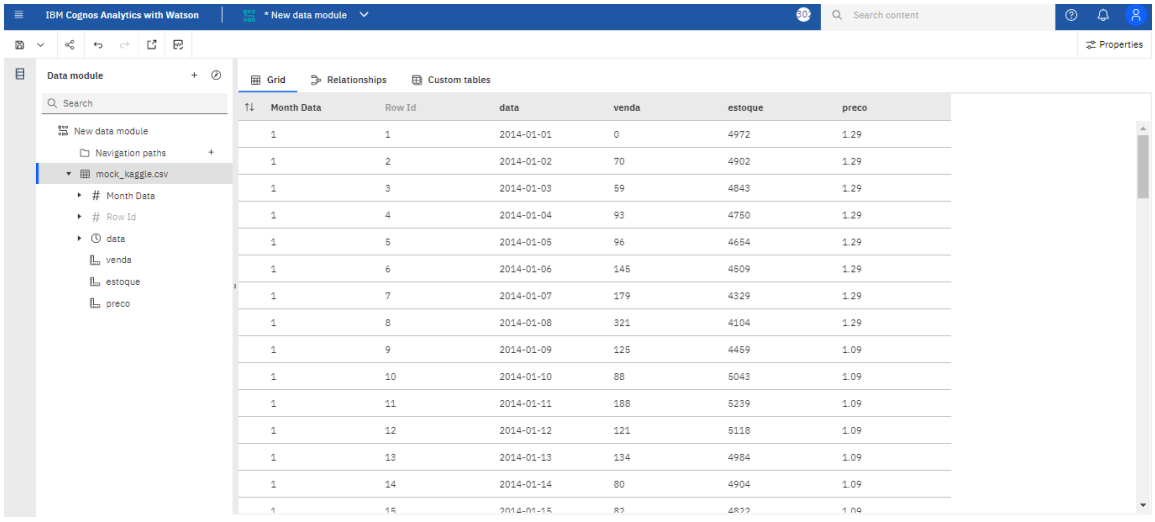




Creating expressions:

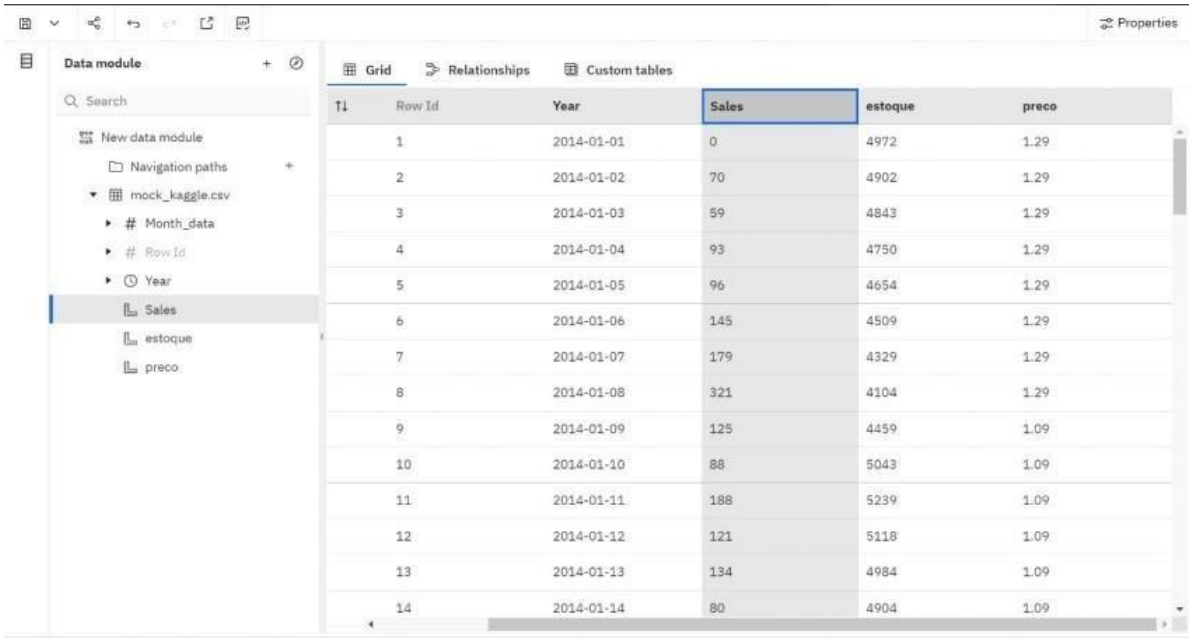


Month Data:



Month Data	Row Id	data	venda	estoque	preco
1	1	2014-01-01	0	4972	1.29
1	2	2014-01-02	70	4902	1.29
1	3	2014-01-03	59	4843	1.29
1	4	2014-01-04	93	4750	1.29
1	5	2014-01-05	96	4654	1.29
1	6	2014-01-06	145	4509	1.29
1	7	2014-01-07	179	4329	1.29
1	8	2014-01-08	321	4104	1.29
1	9	2014-01-09	125	4459	1.09
1	10	2014-01-10	88	5043	1.09
1	11	2014-01-11	188	5239	1.09
1	12	2014-01-12	121	5118	1.09
1	13	2014-01-13	134	4984	1.09
1	14	2014-01-14	80	4904	1.09
1	15	2014-01-15	82	4822	1.09

Sales wise:



Row Id	Year	Sales	estoque	preco
1	2014-01-01	0	4972	1.29
2	2014-01-02	70	4902	1.29
3	2014-01-03	59	4843	1.29
4	2014-01-04	93	4750	1.29
5	2014-01-05	96	4654	1.29
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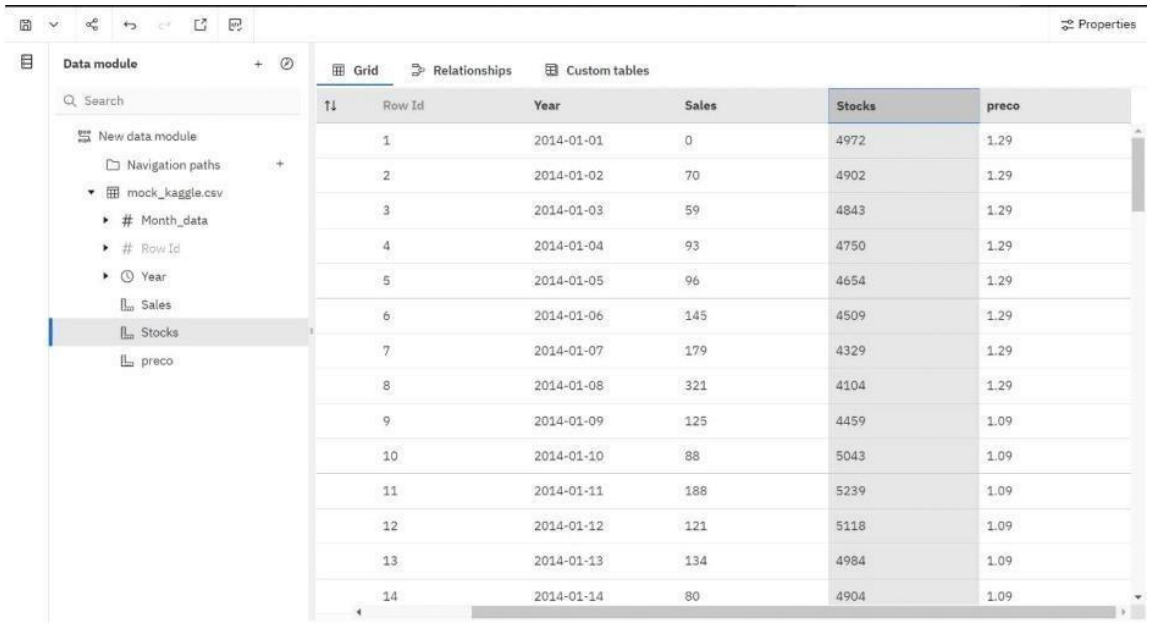
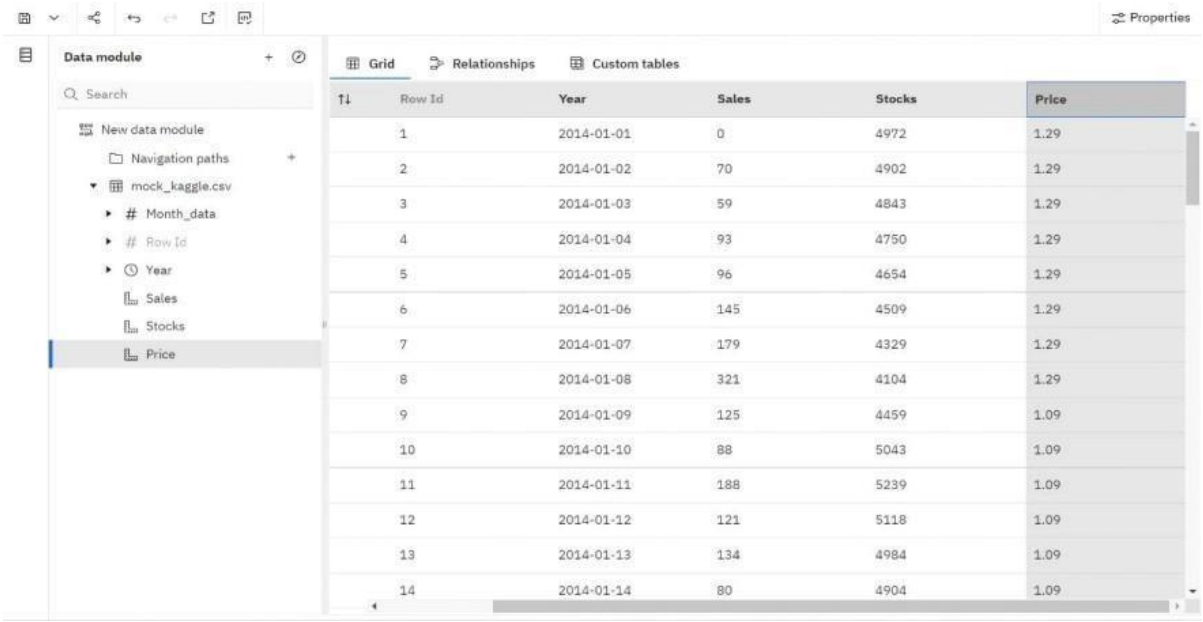
9	2014-01-09	125	4459	1.09
10	2014-01-10	88	5043	1.09
11	2014-01-11	188	5239	1.09
12	2014-01-12	121	5118	1.09
13	2014-01-13	134	4984	1.09
14	2014-01-14	80	4904	1.09

Stock wise:



Row Id	Year	Sales	Stocks	preco
1	2014-01-01	0	4972	1.29
2	2014-01-02	70	4902	1.29
3	2014-01-03	59	4843	1.29
4	2014-01-04	93	4750	1.29
5	2014-01-05	96	4654	1.29
6	2014-01-06	145	4509	1.29
7	2014-01-07	179	4329	1.29
8	2014-01-08	321	4104	1.29
9	2014-01-09	125	4459	1.09
10	2014-01-10	88	5043	1.09
11	2014-01-11	188	5239	1.09
12	2014-01-12	121	5118	1.09
13	2014-01-13	134	4984	1.09
14	2014-01-14	80	4904	1.09

Pricewise:



Row Id	Year	Sales	Stocks	Price
1	2014-01-01	0	4972	1.29
2	2014-01-02	70	4902	1.29
3	2014-01-03	59	4843	1.29
4	2014-01-04	93	4750	1.29
5	2014-01-05	96	4654	1.29
6	2014-01-06	145	4509	1.29
7	2014-01-07	179	4329	1.29
8	2014-01-08	321	4104	1.29
9	2014-01-09	125	4459	1.09
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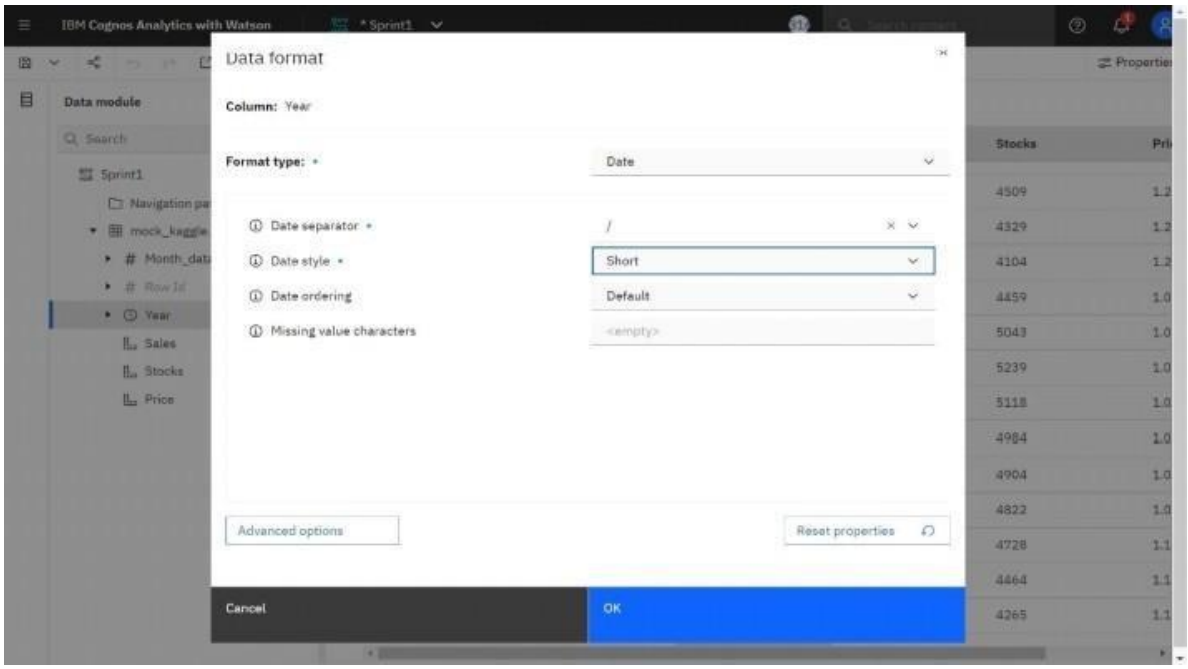
11	2014-01-11	188	5239	1.09
12	2014-01-12	121	5118	1.09
13	2014-01-13	134	4984	1.09
14	2014-01-14	80	4904	1.09

Year format data:



7.2 DELIVERY OF SPRINT 2

SPRINT-2:

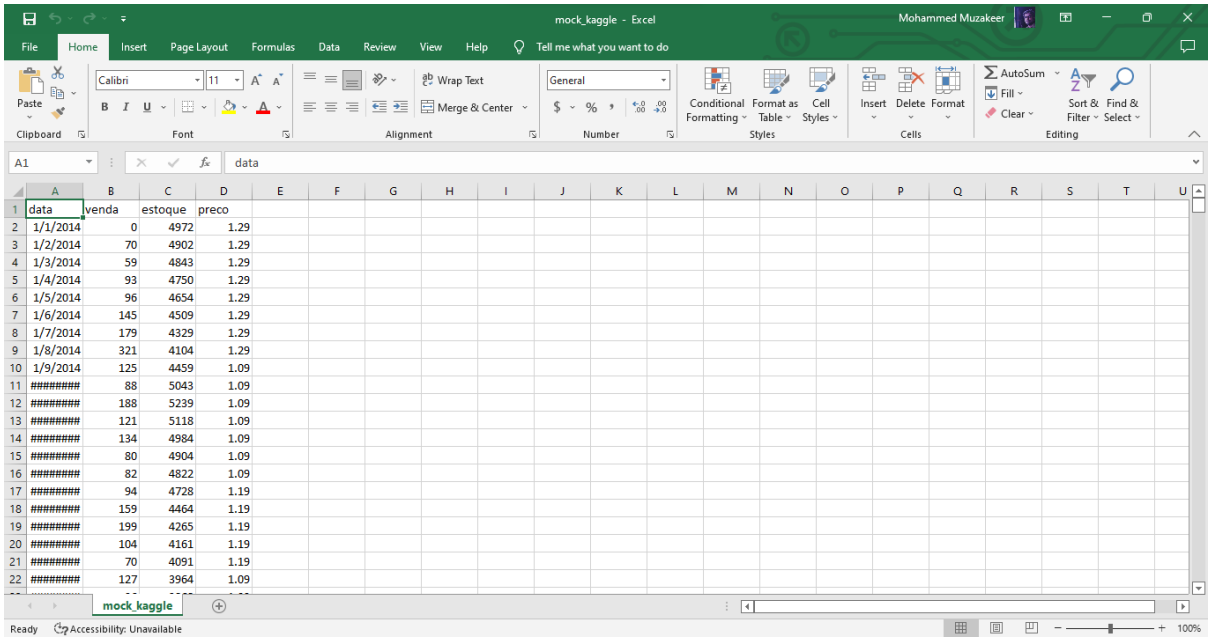
DATA EXPLORATION

- ✓ LOAD THE DATASET
- ✓ SALES ANALYSIS
- ✓ PRICE ANALYSIS
- ✓ STOCK AND PRICE FOR YEAR COLORED BY PRICE PRICE FOR YEAR
- ✓ STOCK AND SALES FOR YEAR COLORED BY YEAR
- ✓ YEAR COLORED BY YEAR SIZED BY STOCK
- ✓ STOCK TREE SUNBURST
- ✓ SALES TO PRICE WITH LINE WIDTH PRICE
- ✓ STOCK USERS
- ✓ YEAR SIZED BY SALES
- ✓ PREPARED DATA LINK

DATA COLLECTION:

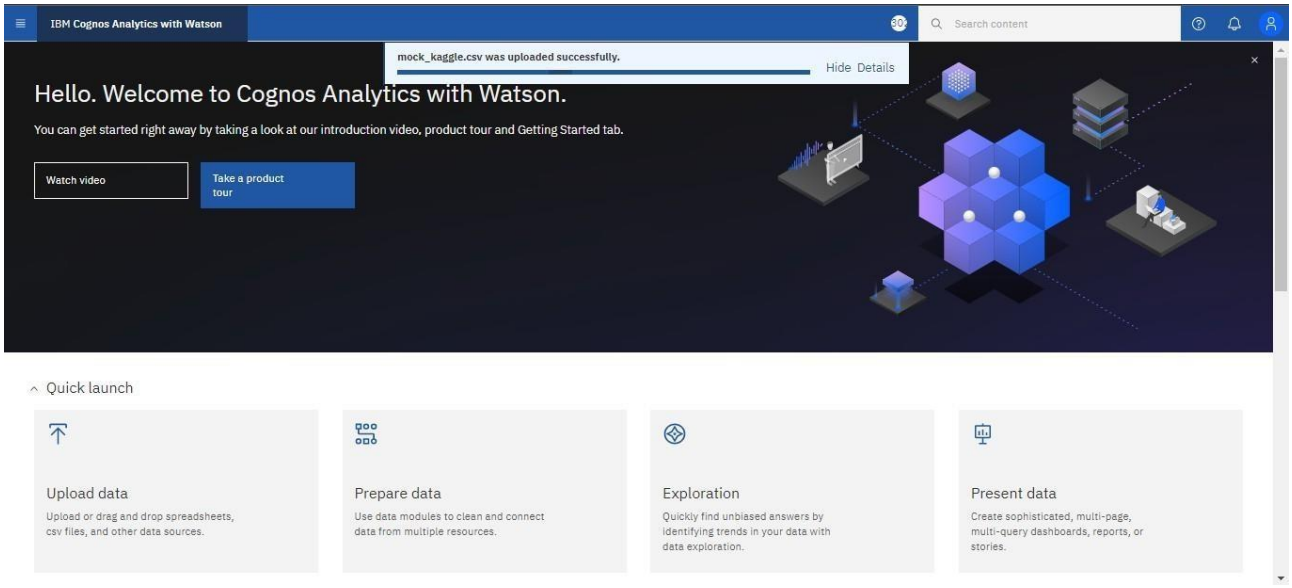
Download the Dataset

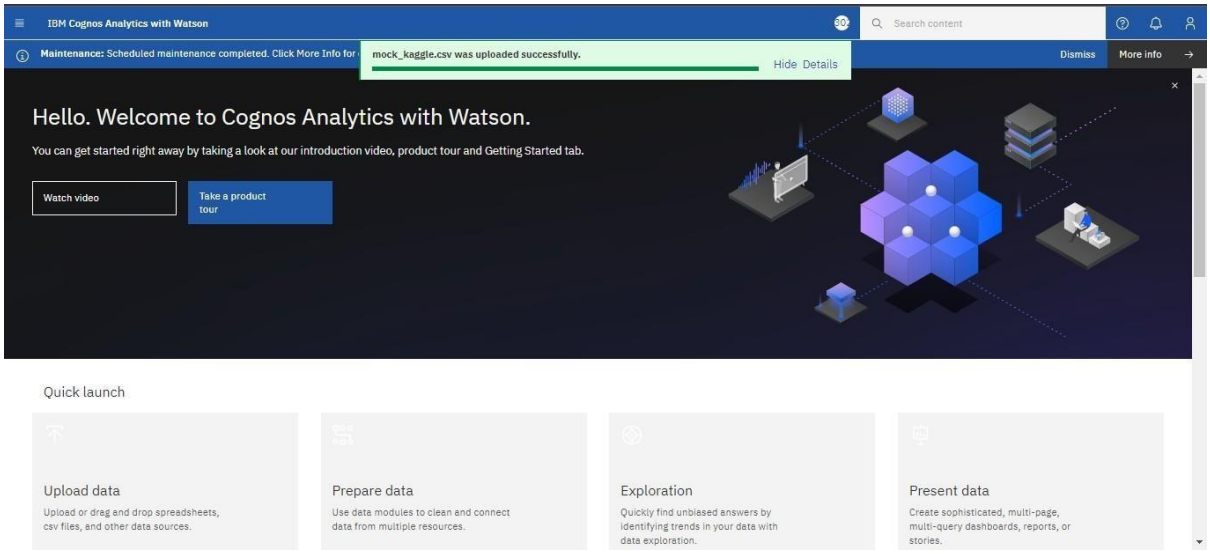
1. Download the dataset



2. Loading the dataset

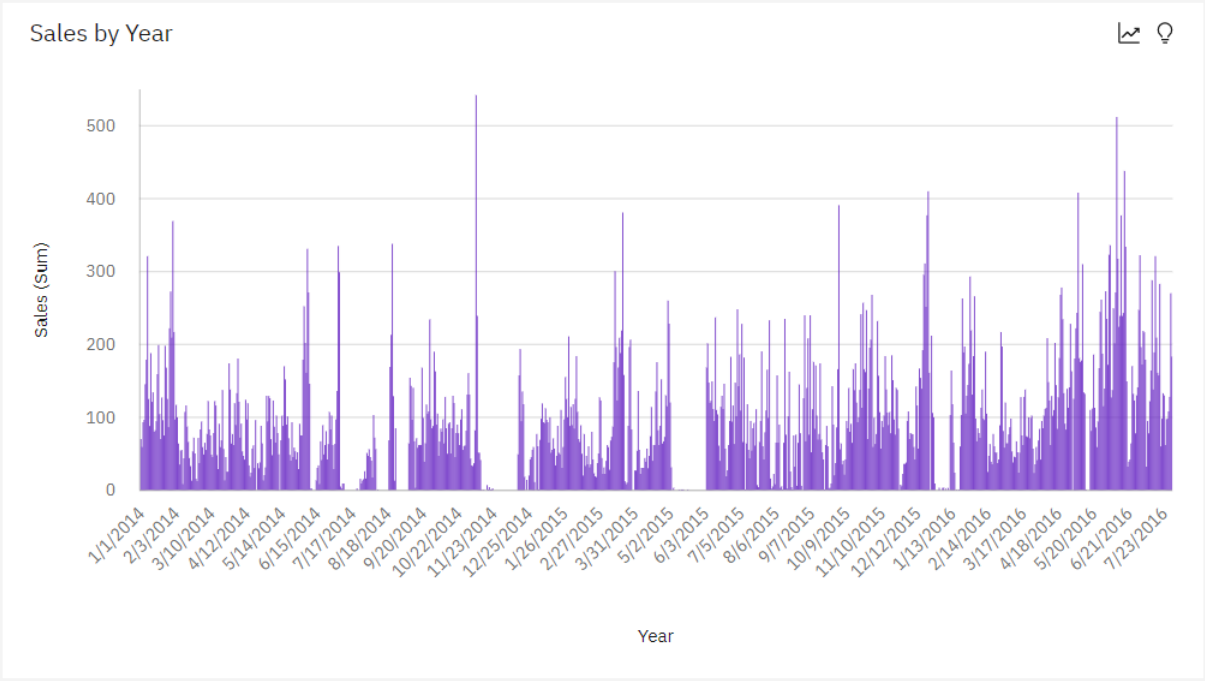
Tool Used – IBM Cognos Analytics



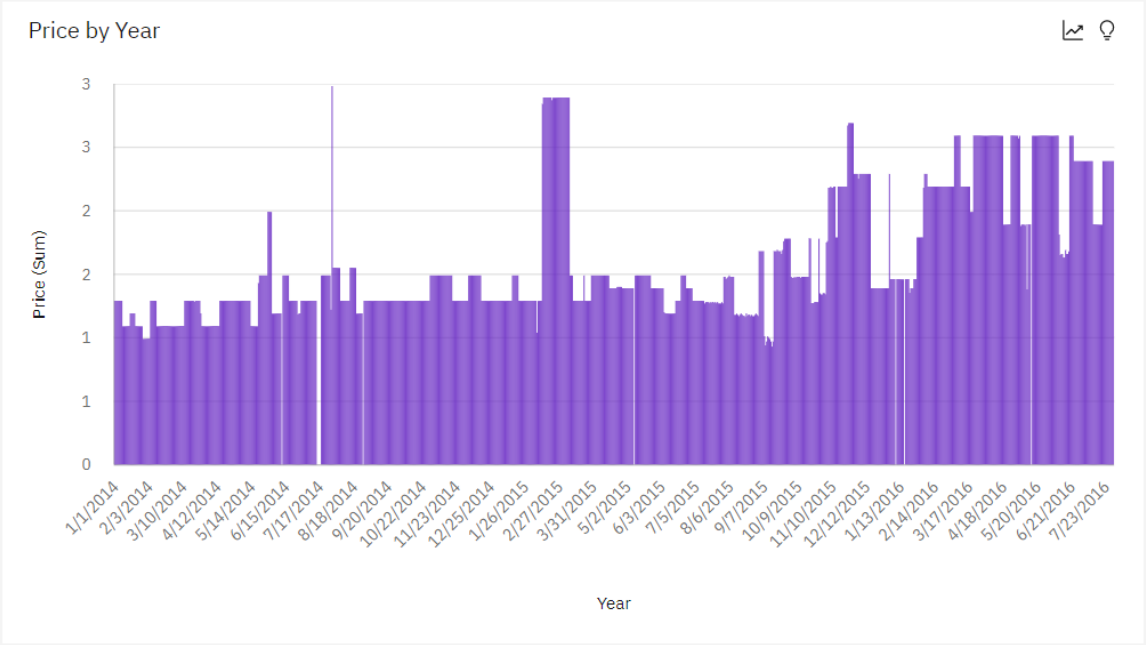


DATA EXPLORATION:

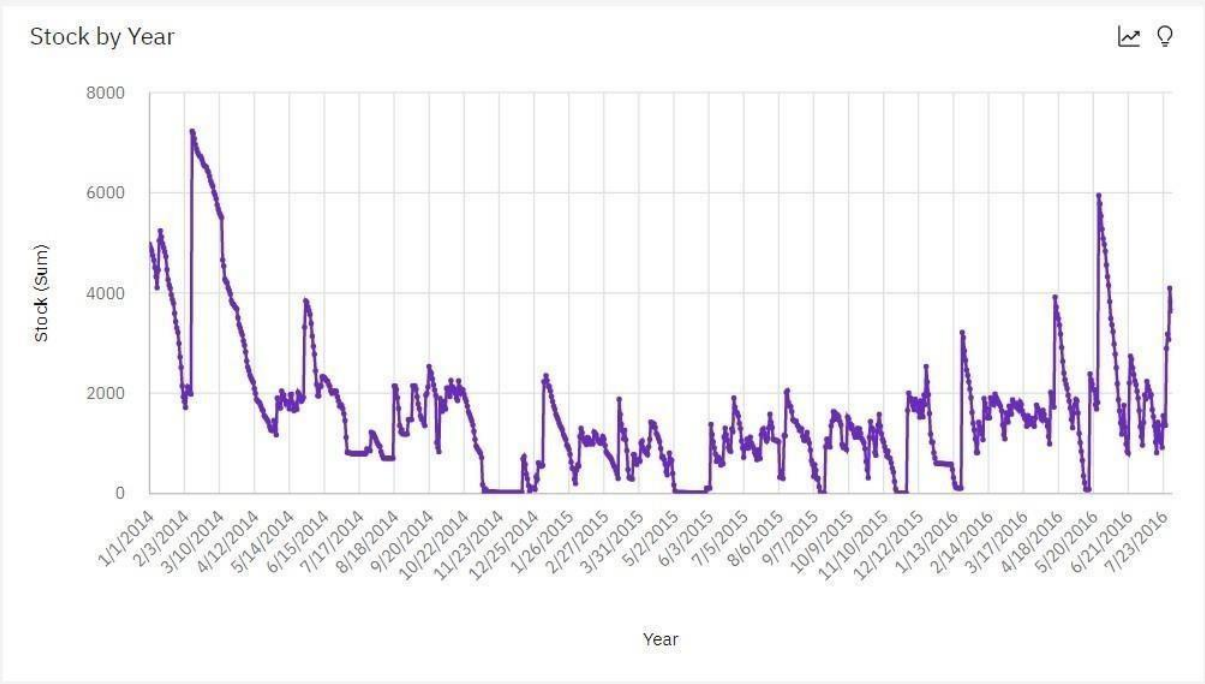
1. Sales by Year:



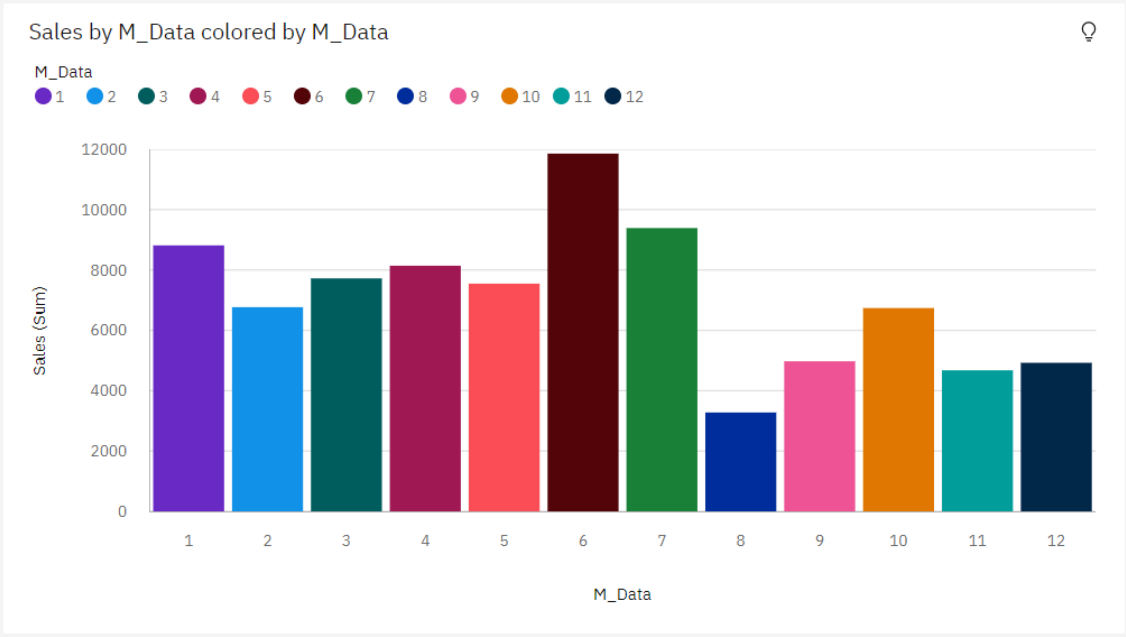
2. Price by Year:



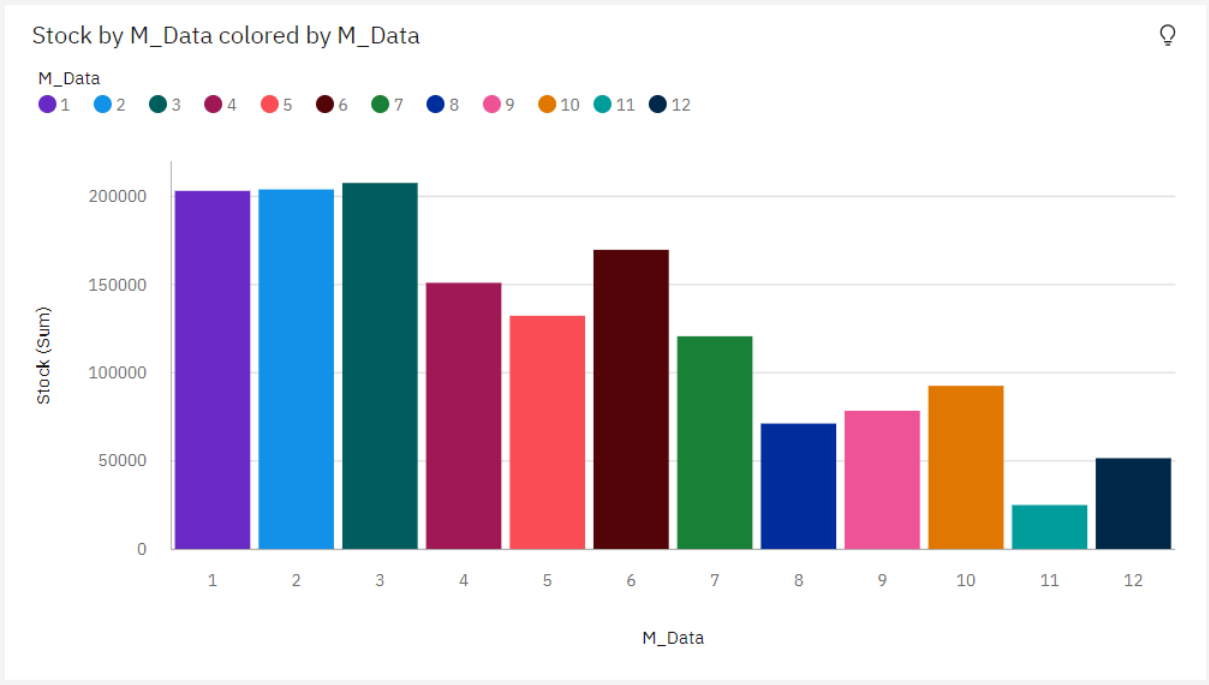
3. Stock by Year:



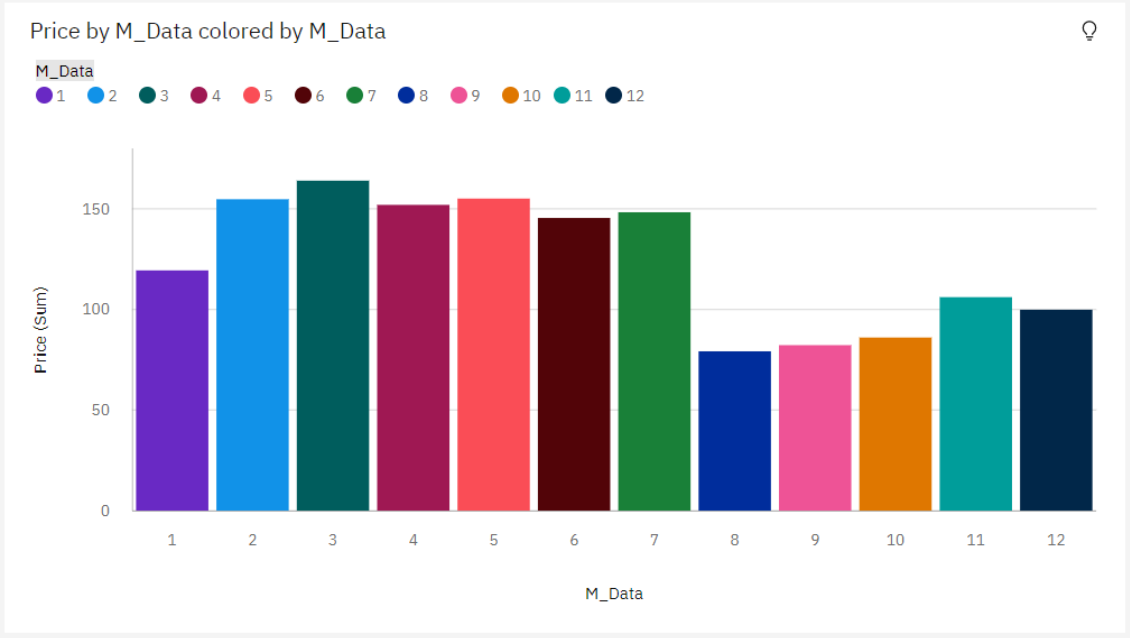
4. Sales by M_Data colored by M_Data:



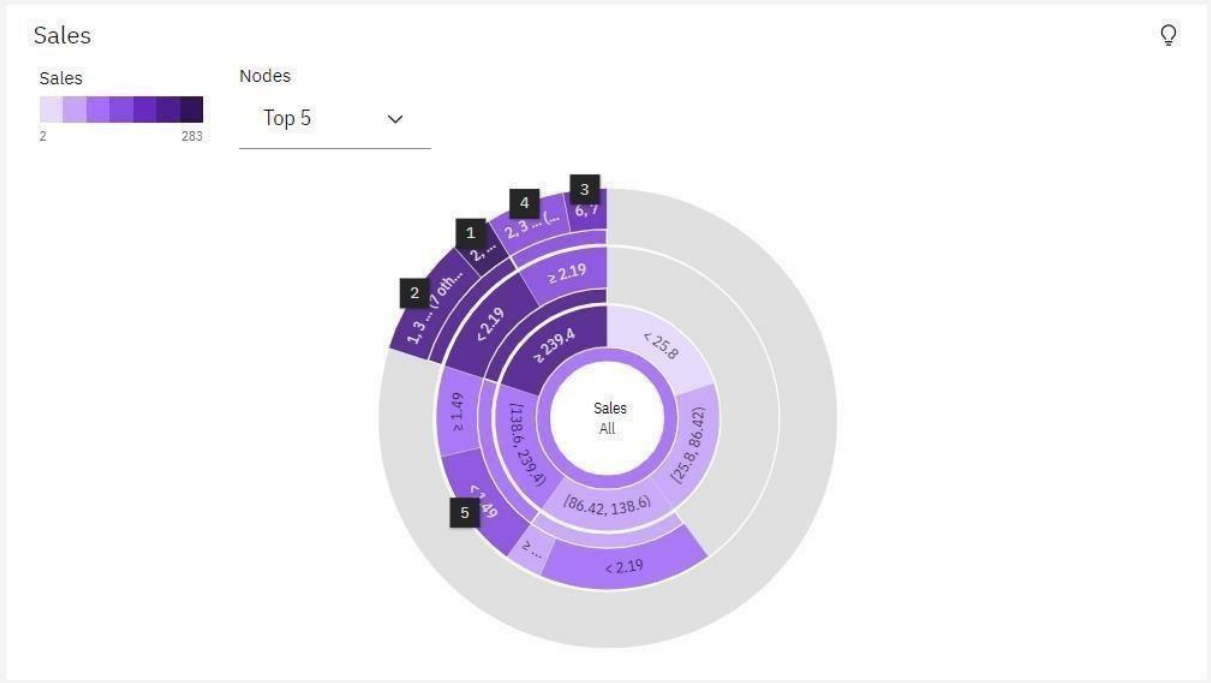
5. Stock by M_Data colored by M_Data:



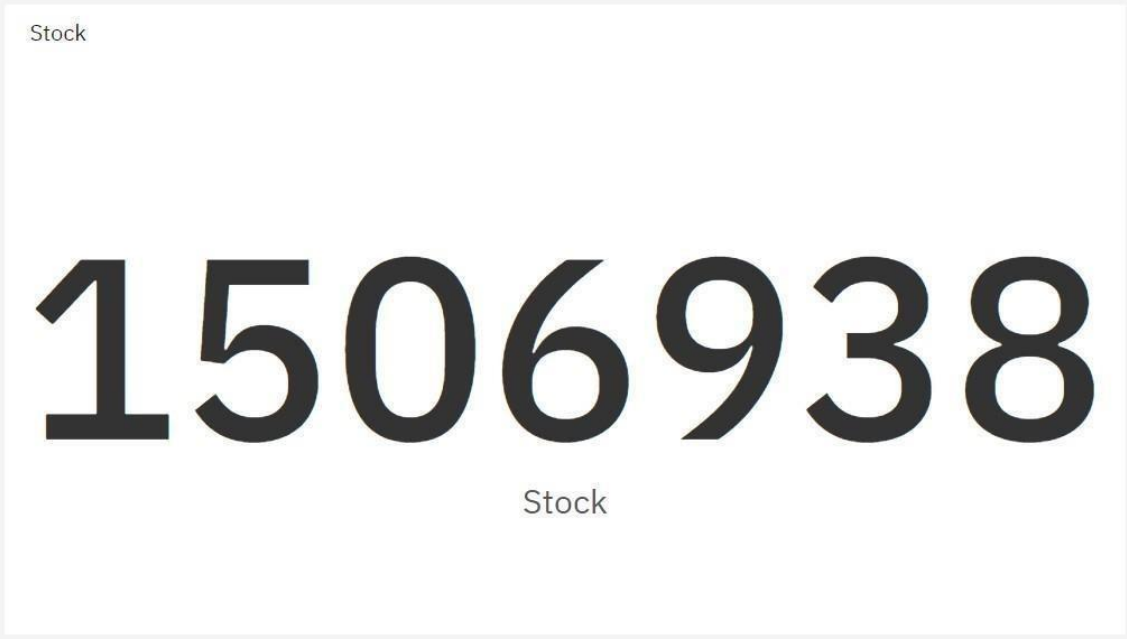
6. Price by M_Data colored by M_Data:



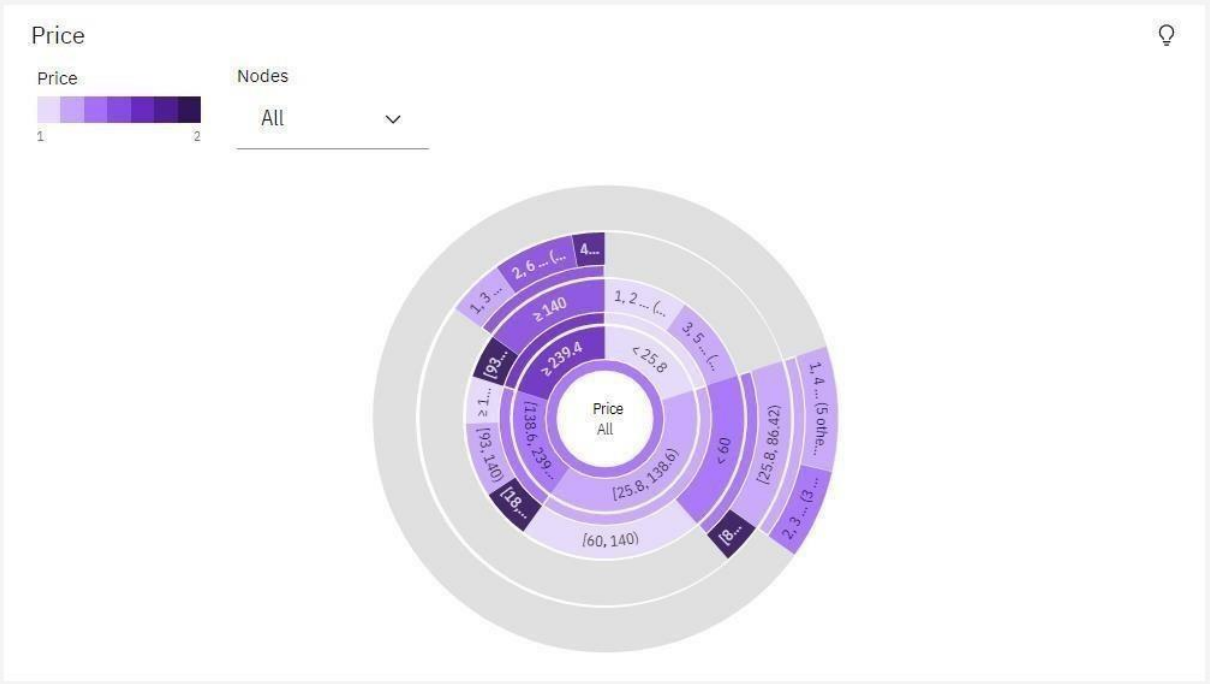
7. Sales Sunburst:



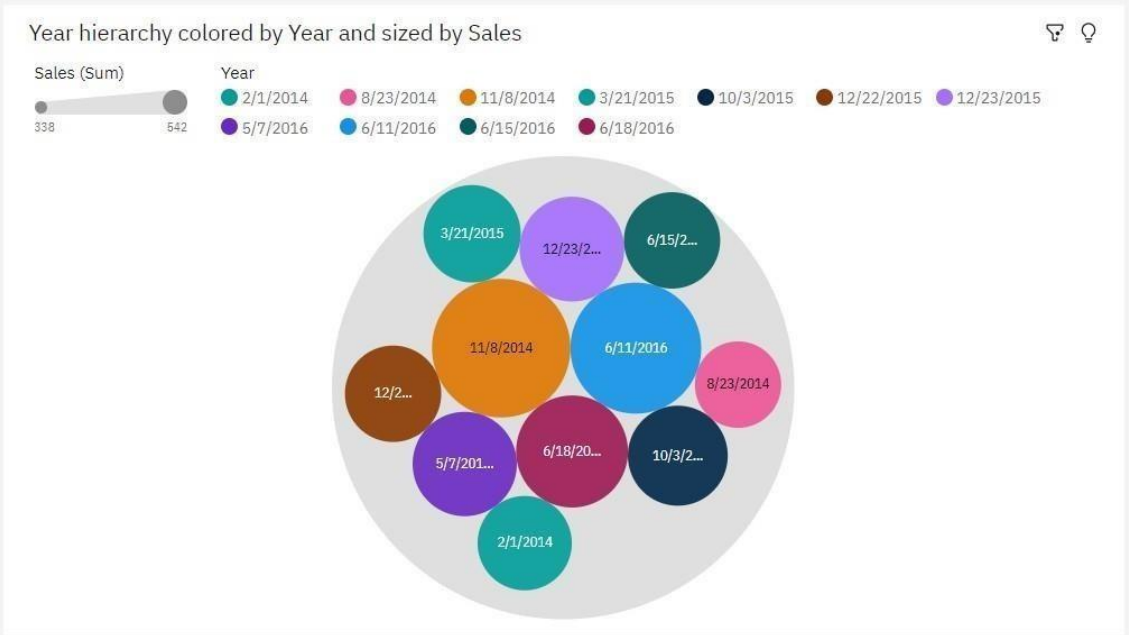
8. Stock Summary:



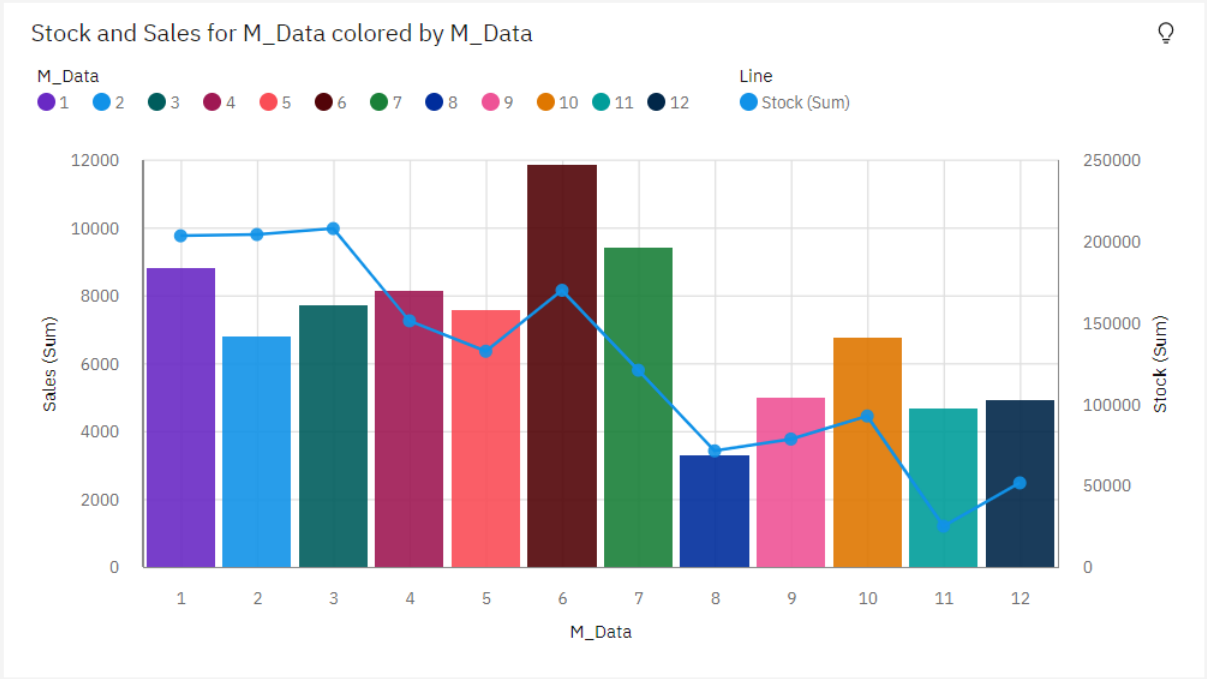
9. Price Sunburst:



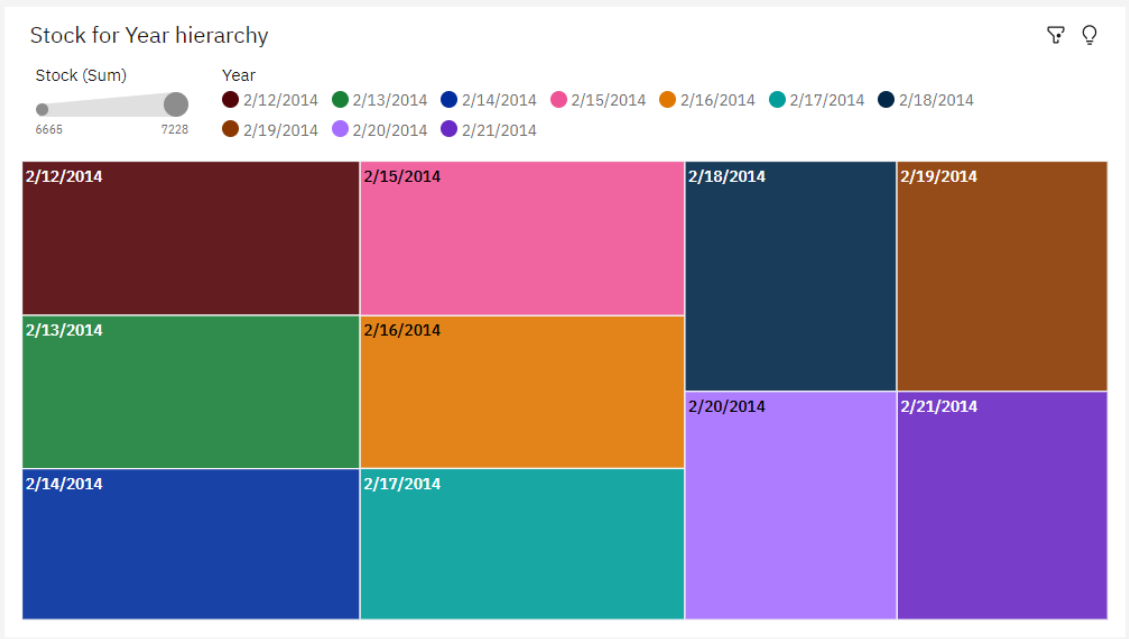
10. Year hierarchy colored by Year and sized by top 10 Sales:



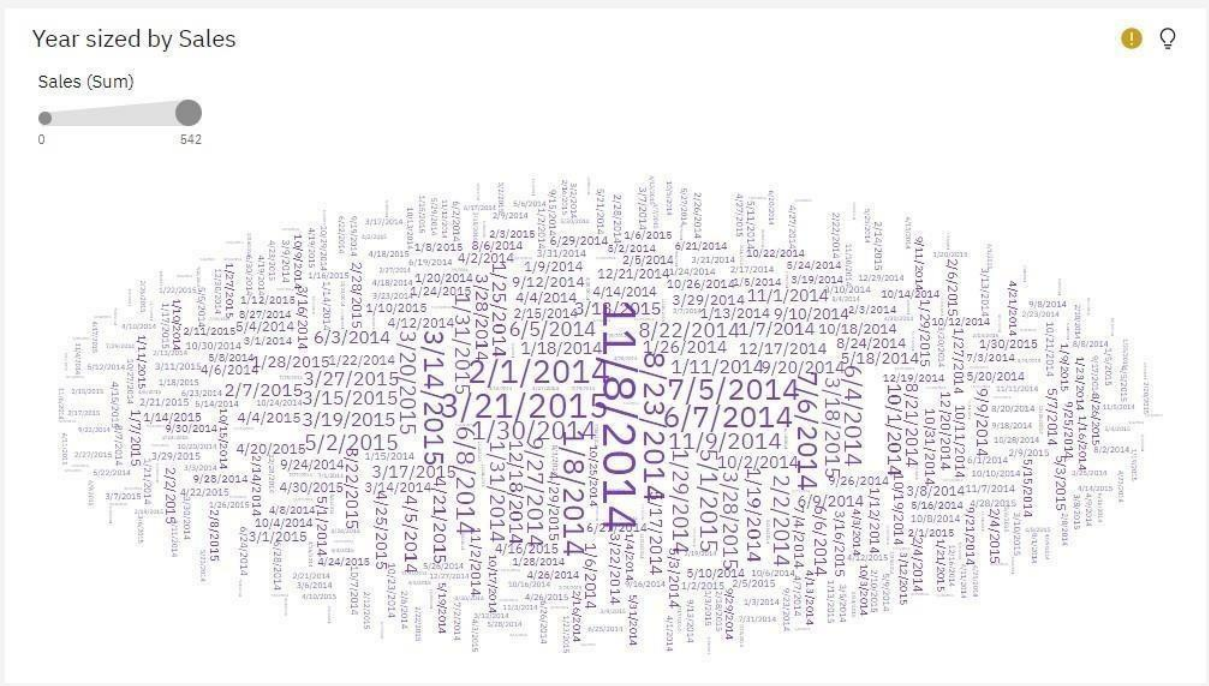
11. Stock and Sales for M_Data colored by M_Data:



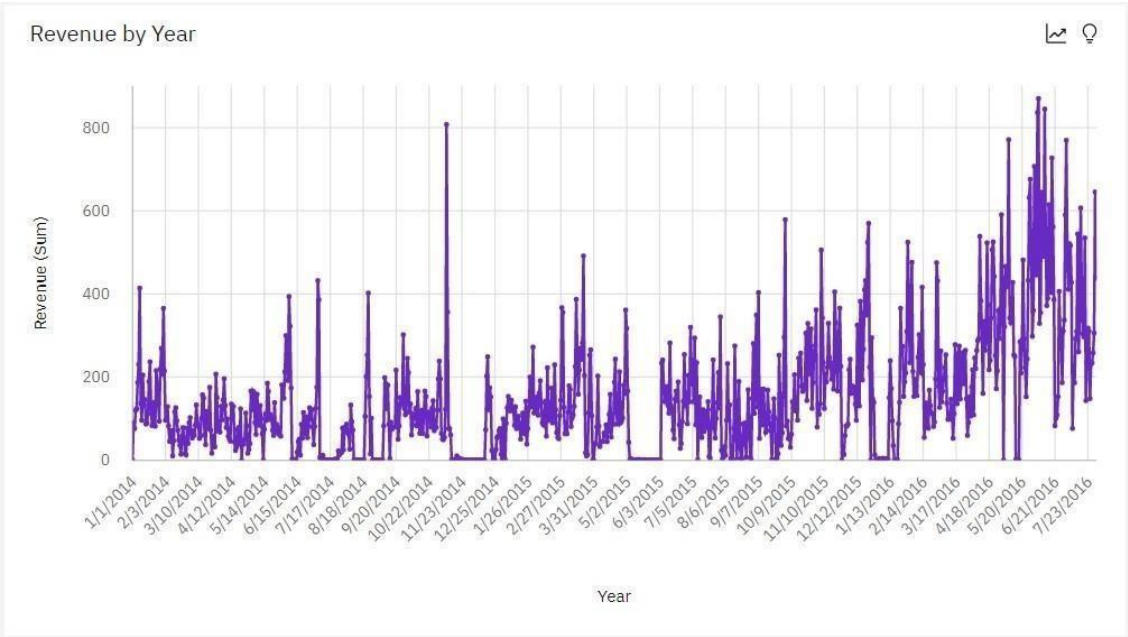
12. Top 10 Stock for Year hierarchy:



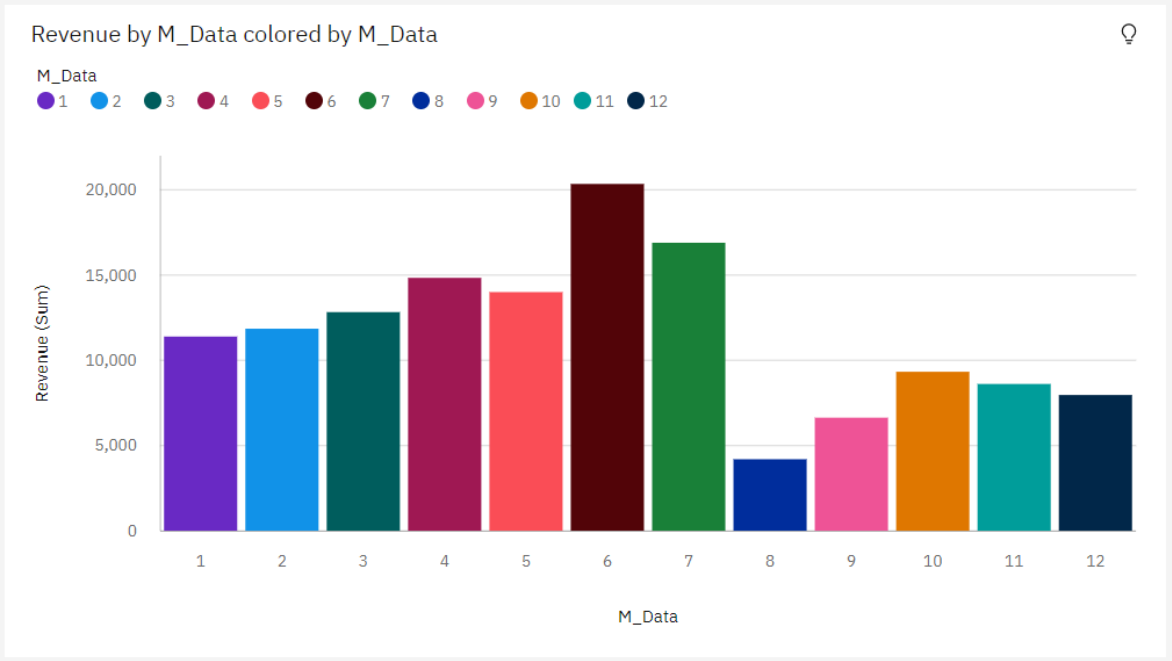
13. Wordcloud for Year sized by Sales:



14. Revenue by Year:



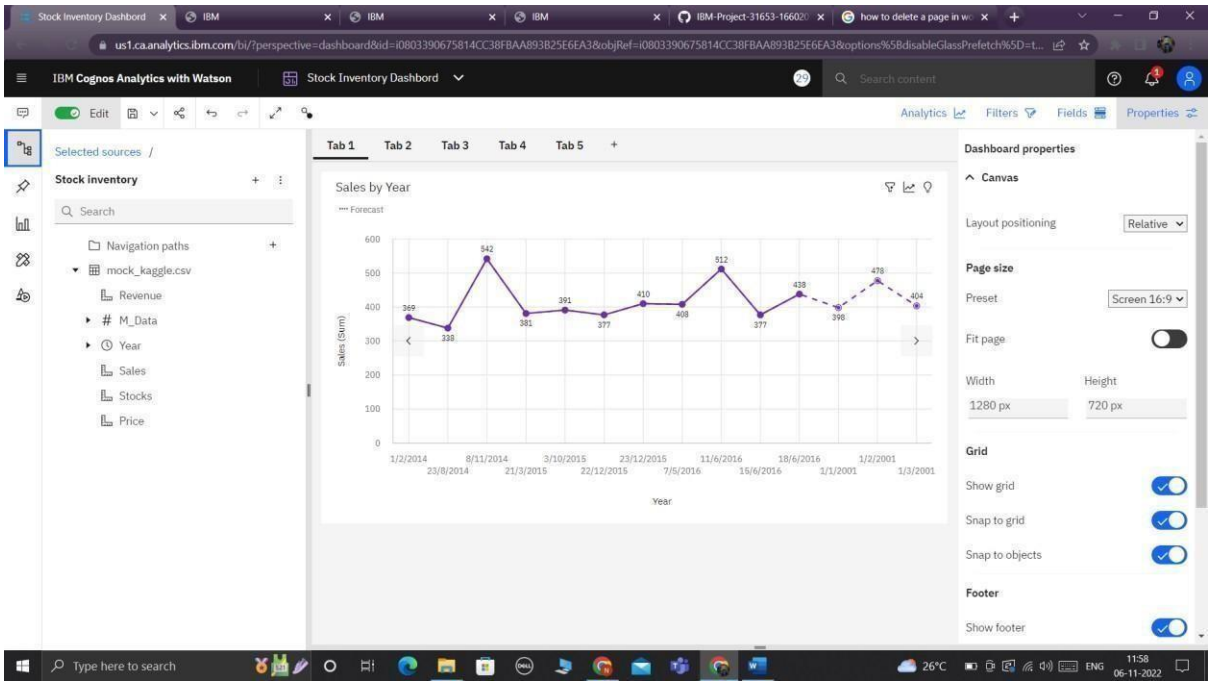
Revenue by M_Data colored by:



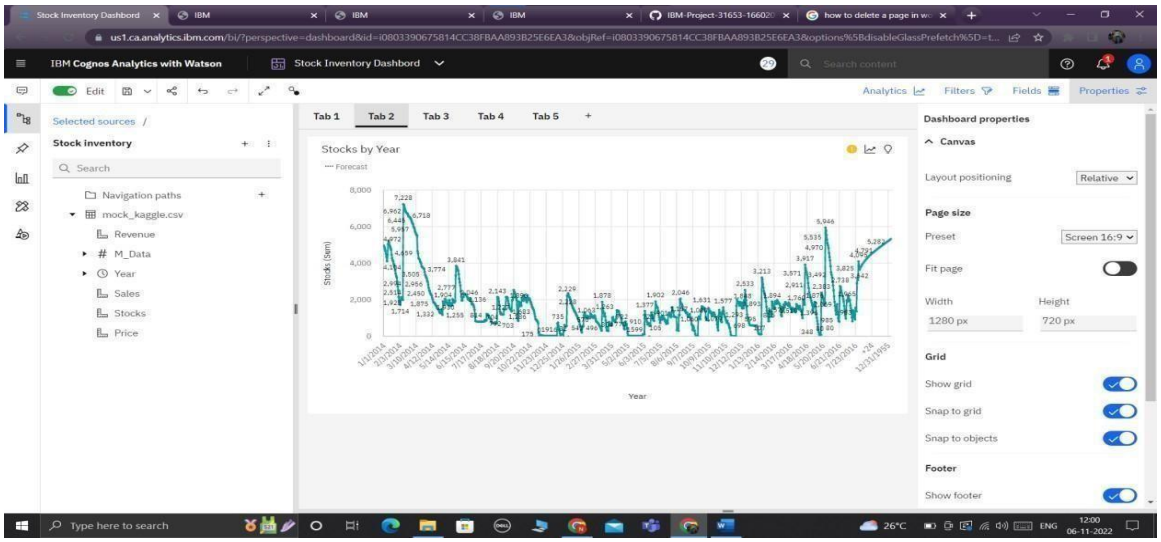
7.3 DELIVERY OF SPRINT 3

Dashboard Creation:

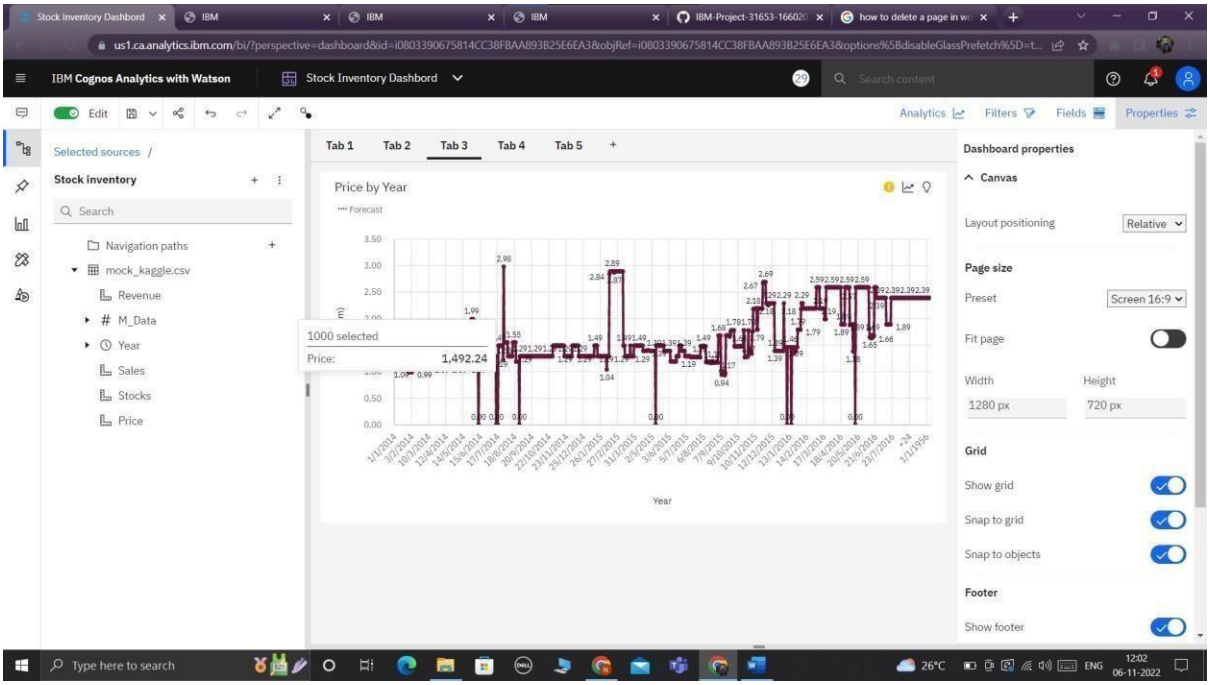
Sales by Year Line Chart



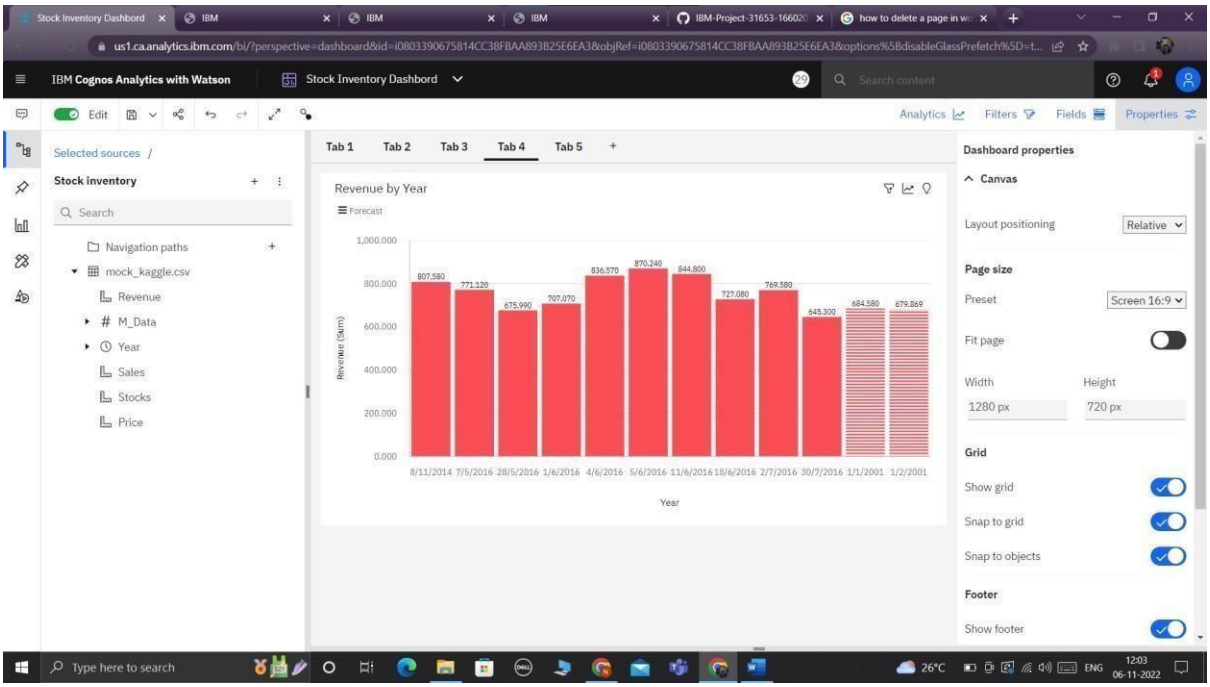
Stock by Year a Line Visual :



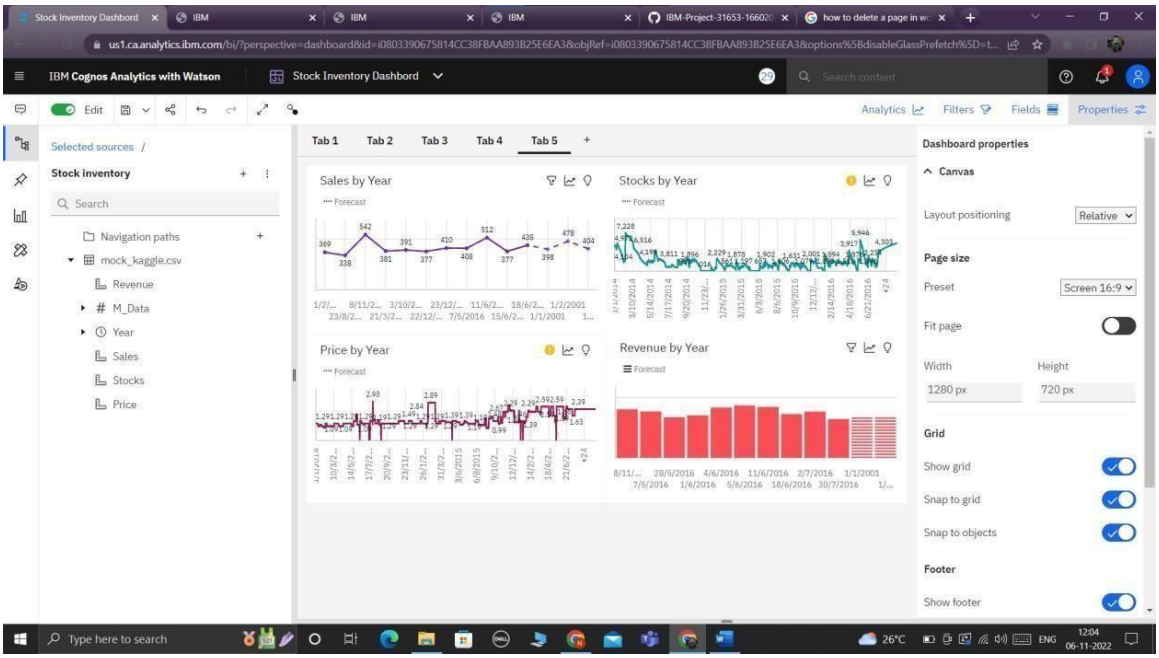
Price by Year Line visual :



Revenue by Year Column Forecast visual.

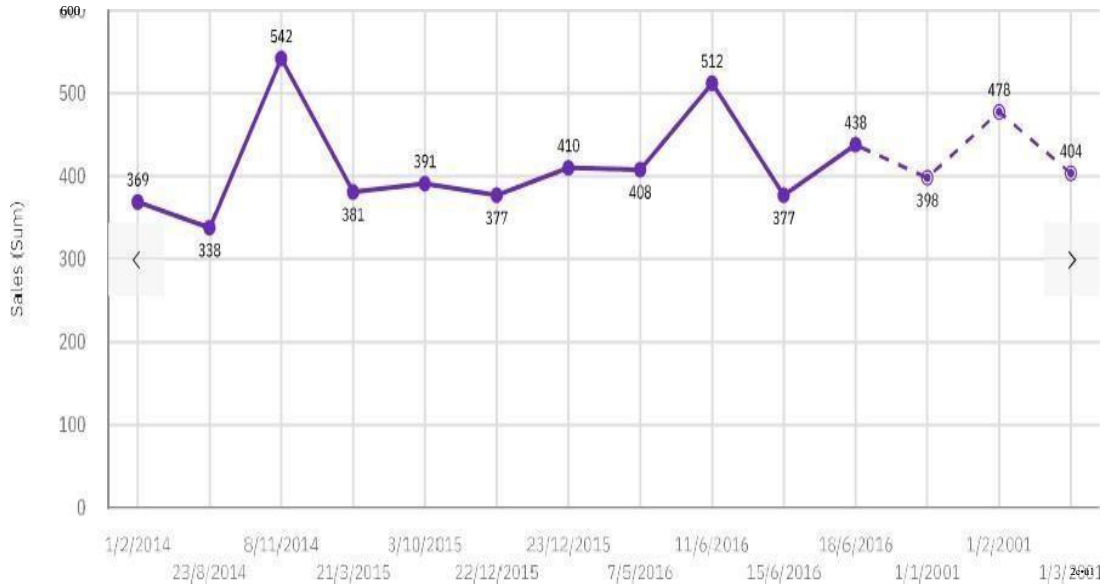


Dashboard creation.

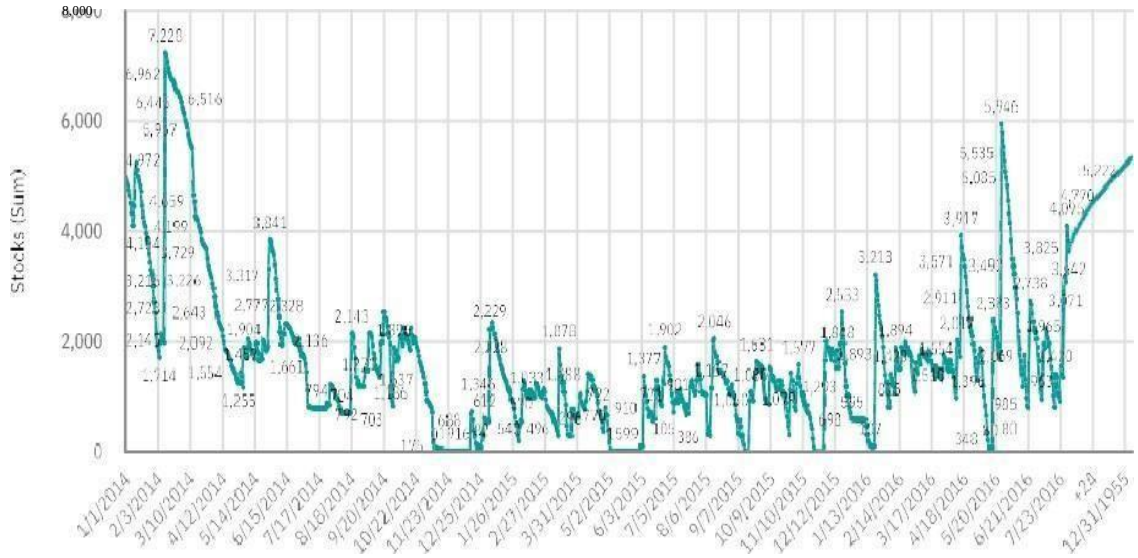


Dashboard:
Stock inventory dashboard

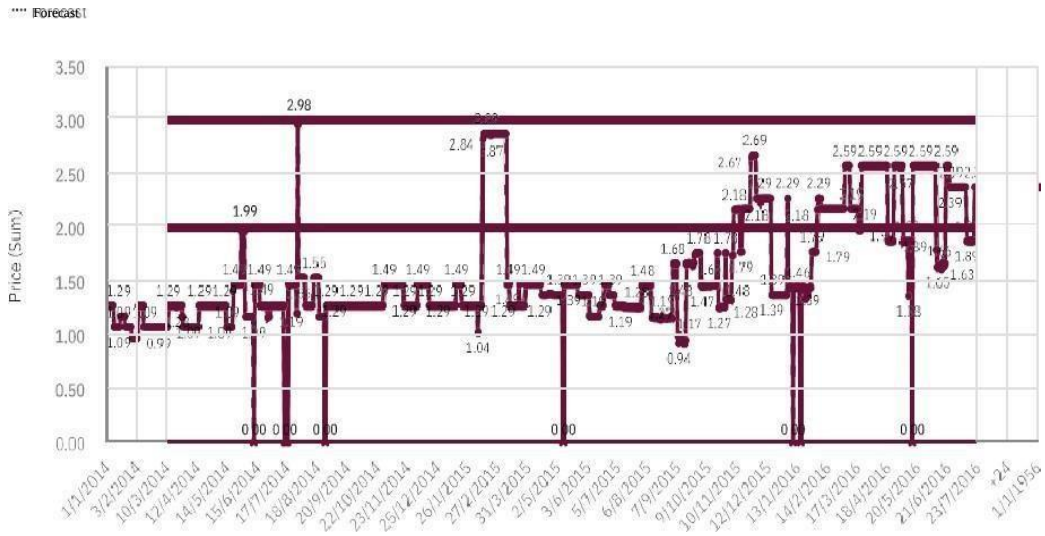
1) Forecast by years:



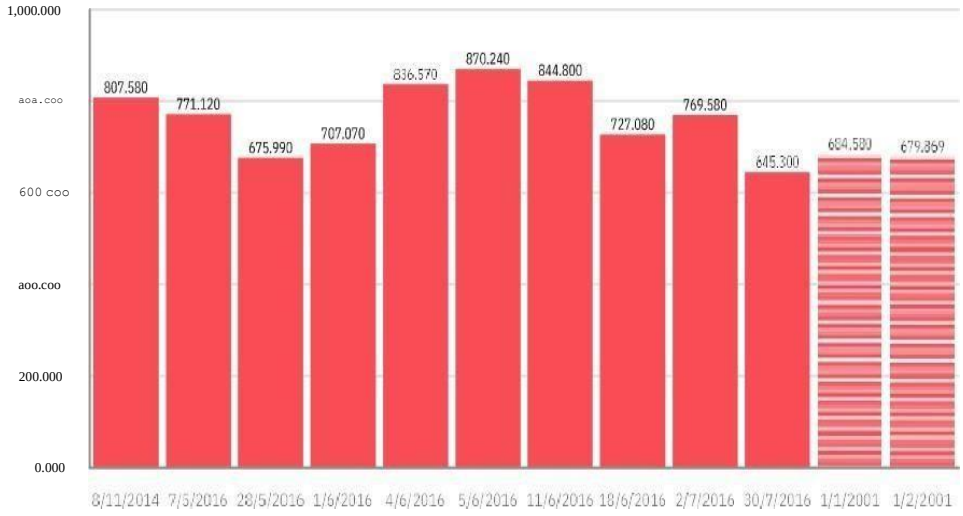
2) Stocks by years:



3) Price by years:



4)Revenue by year:



7.4 DELIVERY OF SPRINT 4

Retail store stock inventory analytics report :

8.CONCLUSION

Retail store managers must implement electronic systems to manage the company's resources in order for the program to be successful. This must be done in a modern manner for inventory management. Because ofthis, it is possible to keep track of them and there are always accurate records that can be referred to in an emergency. In addition, the retail management system is required to guarantee that the company's stock management practices are accountable. It aids in time savings.

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.

9.REFERENCES

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10.APPENDIX

GitHub & Project Demo Link :

https://github.com/IBM-EPBL/IBM-Project-5140-1658748243.git