RETAIL STORE STOCK INVENTORY ANALYTICS

NALAIYA THIRAN PROJECT BASED LEARNING

on

PROFESSIONAL READINESS FOR INNOVATION,EMPLOYABILITY AND ENTREPRENEURSHIP

A PROJECT REPORT

MEENAKSHI S	310619104067
PAVITHRA P	310619104086
PREETHA P	310619104094
RITHANYA S	310619104105

BACHELOR OF ENGINEERINGIN

COMPUTER SCIENCE AND ENGINEERING

EASWARI ENGINEERING COLLEGE

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

CHENNAI – 600 089

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EASWARI ENGINEERING COLLEGE

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

Bharathi Salai, Ramapuram
Chennai – 600 089

INTERNAL MENTOR

Hari Kumar,

Assistant Professor,

Department of Computer Science and Engineering,

Easwari Engineering College,

Chennai – 600 089

INDUSTRY MENTOR

Shivani Kapoor

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ABSTRACT

In recent years, effective inventory management has grown in importance as a key component of business success. Consequently, research supporting the purchase and deployment of sophisticated inventory management and control systems are tough to obtain. In general, retail inventory management is the process of ensuring that retail enterprises have the appropriate products, in the appropriate quantities, at the appropriate times. This entails being aware of when the suppliers will deliver products, how much of each item you have on hand in-store, when you're running low on stock, how to select when and what to order in a reorder, and precisely track products—all while keeping your pricing strategy in mind. When retail inventory management is done correctly, retailers avoid product shortages and surpluses, both of which are expensive. Poor inventory management choices cost U.S. merchants $300 billion in revenue in just one year. Demand forecasting is crucial to inventory management and is what makes the company future-proof.
Businesses that don't predict demand and suddenly order fresh inventory can end up with product shortages or surpluses. The capital becomes constrained by inventory and holding costs when an excessive amount of unsold inventory remains. When there is no enough supply of a product which is in high demand, which ultimately drives clients to your competitors.

INTRODUCTION

Stocked items are referred to as inventory. Each retail chain maintains a separate warehouse to store the goods for usage when the current stock has to be replenished. Inventory management is the practise of keeping goods on hand for emergency usage. To avoid being "out of stock," the store monitors the stocked items and makes sure there is extra supply. A procedure like this is referred known as inventory management. The days of customers having few shopping options are long gone. In the current situation, a client has access to a second brand if he cannot find the requested goods at one retail store. A retailer cannot risk losing even one consumer. Both attracting new consumers and keeping the ones they already have is crucial for the retailer. Every consumer must be happy as they leave the retailer's establishment. Customers have a negative first impression of the store when there is no inventory available and the shelves are empty, making them hesitant to return. Inventory control avoids this kind of circumstance. One must be aware that it takes time for the goods to go from the supplier's facility to the store. To give customers during the "lead time," the business must have enough inventory. Keeping track of inventory also benefits the retailer under uncontrollable circumstances like transit strikes, curfews, etc. Even during a crisis, the shop has enough goods due to wise inventory management.

Advanced artificial intelligence (AI) and machine learning (ML) techniques, such as deep learning and neural networks, are used in inventory optimization solutions powered by data science. They assist businesses in reducing the costs associated with shortages and overstocking while avoiding stock-outs and shortages. Main capabilities include analytics-based inventory planning, determining the best safety stock across storage and selling locations, and calculating the time needed to replenish each inventory item. Complex distribution networks with multiple tiers, perishable inventory, and seasonal products are suitable. Integrations that are essential include those with a CRM, ERP, procurement software, pricing software, etc.

OBJECTIVE

- To make use of IBM Cloud.
- To utilize IBM Cognos for visualization.
- To learn about different visualization charts.
- To create dashboard using IBM Cognos.

Primary objective:

1. Determining Consumer Demands:

A retailer's initial responsibility is to determine the needs and wishes of the consumer. The merchant offers finished products and services in the form that customers want rather than providing raw resources. The retailer occasionally collects data about users' interests, tastes, and likes for this reason.

2. Management of Stock:

A retailer's management of merchandise is their second responsibility. The merchant fulfils the task of keeping the goods in storage and making deliveries as and when the consumer requests them.

3. Convenience of timing:

With nearly one in ten people working outside of regular business hours, the new trend in retailing toward longer trade hours reflects these socio-cultural shifts. This is a solution for small merchants facing the lower prices of superstores and other retail chains. Retailers establish place utility by being available in a place that is both accessible and handy for shopping. Finally, businesses create ownership utility when customers choose and purchase certain items.

3. Ideation Phase

3.1 LITERATURE SURVEY

S. no.	*Title*	*Author*	*Year of publication.*	*Problem identification*	*Drawbacks*
1.	Research mythology	Cinthya Vanessa Muñoz Macas Industrial Engineering, Faculty of Chemical Sciences University of Cuenca Cuenca, Ecuador 0000000198200331	March 2017	Market research, in other words, is **research about the world of your retail business**. Among other essential details, it will provide you with data on your target shopper's buying power, shopping preferences, and relationship with competitors	• Marketing research (MR) is a costly affair. • It is also length y and time-consuming. • It has a limited scope.
2.	Content Analysis	Rodrigo Arcentales-Carrión Research Group in Accounting, Finance, and Taxation, Faculty of Economics and	March 2022	Solving Your Out-of-Stock Problem Once and for All. ...	• Can be extremely time consuming. • Is subject to increased error, particularly when relational analysis.

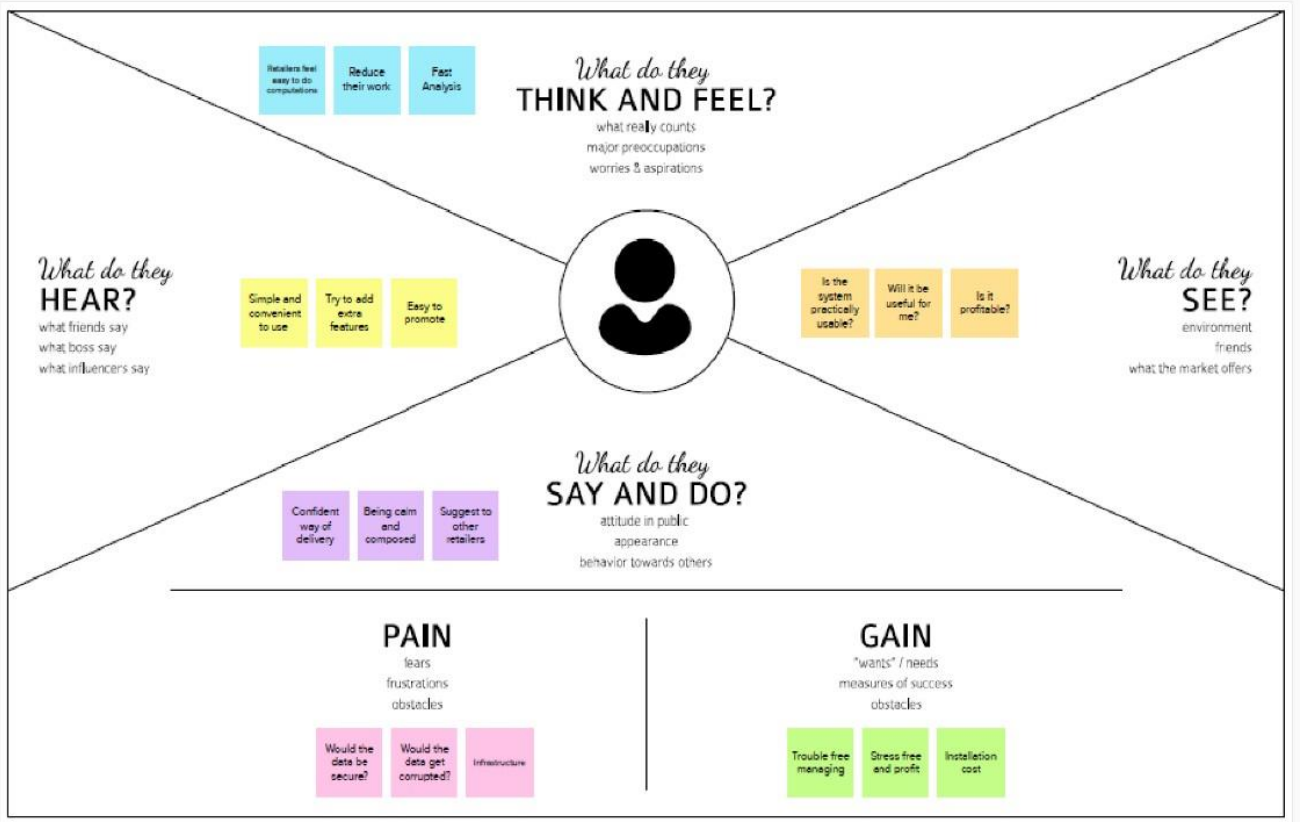
3.	Product reordering or replenishment.	Mario Peña Research Department (DIUC) University of Cuenca Cuenca, Ecuador 0000−0002−3986−7707	February 2021	A reorder point (ROP) is **a specific level at which your stock needs to be replenished**. In other words, it tells you when to place an order so you won't run out of stock.	The two factors that determine the appropriate order point are the delivery time stock which is the Inventory needed during the lead time
4.	Concept and Objective	Siddharth sai	2020	• Lack of visibility • Disconnected store teams.	Inconsistence, Warehouse efficiency etc.
5.	Sales Data, and Inventory Balance	Rodrigo Arcentales-Carrion University of Cuenca	Early 2021	The problem faced by the company is **they do not have any systematic system to record and keep their inventory** data. It is difficult for the admin to record the inventory data quickly and safely because they only keep it in the logbook and not properly organized.	Sales Data, and Inventory Balance

6.	Systems, methodologies, and tools focused on inventory records and localization	Mario Pena University of Cuenca	Starts in 2019	The problem faced by the company is **they do not have any systematic system to record and keep their inventory** data. It is difficult for the admin to record the inventory data quickly and safely because they only keep it in the logbook and not properly organized	The limitations of a perpetual inventory system include **a false sense** of **reliability and dependence on human entry**.
7.	Inventory management in retail industry - Application of big data analytics	Hien vu	December 2018	Big data analytics in retail enables companies to create customer recommendation based on their purchase history, resulting in personalized shopping experiences and improved customer service.	One of the best applications of Big data in inventory management comes from **helping businesses forecast their demands**.

8.	**Retailing and retailing research in the age of big data** analytics	Marnik G. Dekimpe	2019	Big data analytics in retail not only has the potential to **improve the operating margins of companies by 60% but revolutionize all areas of retail**.	In the retail industry, big data analytics **helps companies collect and analyse customer purchase history and preference data.**
9.	Inventory Management in Retail Store	Rohan Agawal	2015	It is difficult for the admin to record the inventory data quickly and safely because they only keep it in the logbook and not properly organized	The two factors that determine the appropriate order point are the delivery time stock which is the Inventory needed during the lead time
10.	Retailing Sector and Business Retailing Types	Kujtim Hameli	2009	The economic factors that most affect the demand for consumer goods are **employee wages, prices/inflation, interest** rates**, and consumer confidence**.	The biggest problem with retail business is that **profit margins of this business is fixed** which ranges from 5 to 20 percent depending upon the brand of the product which retailer is selling and also unlike wholesaler who can expand business.

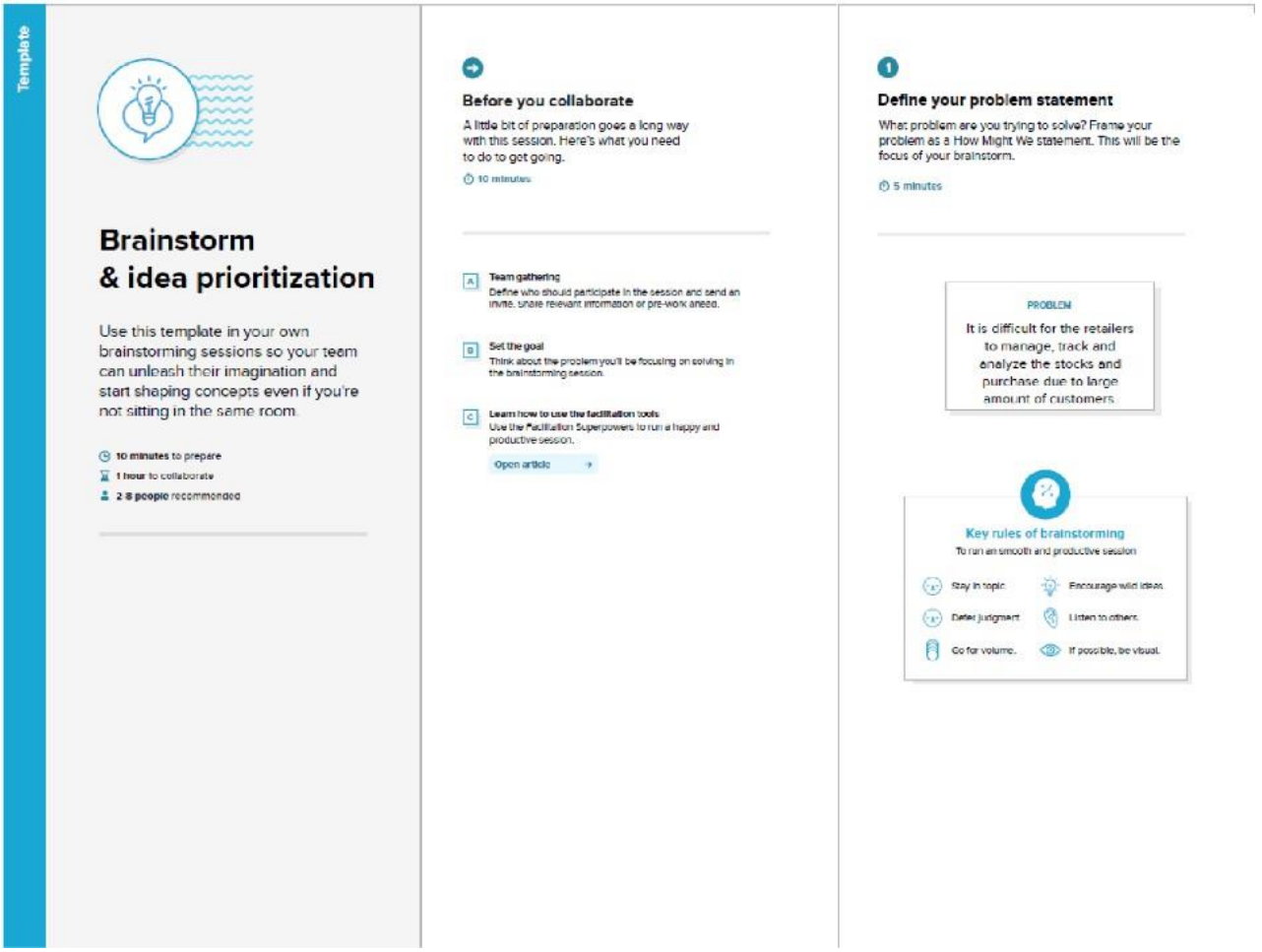
11.	PT.Abaisat Raya	Rahmayanti & Fauzan	2016	The total price required,and how much available space inventory in the warehouse	The financial and operating benefits that companies can achieve with data analysis.
12.	PT.ABC (Construction Company)	Candra	2019	To get the number of safety stock and to determine the maximum inventory.	Is subject to increased error, particularly when relational analysis.
13.	Ciputra	Budiharji & Hadikumiawati	2020	To get the number of forecast sales in the coming year.	Inability to enjoy economies of scale
14.	Amigo Group	Kartikasari &Suhartono	2013	Forecasting product sales in seven stores using the hierarchical time series forecasting method.	Order point are the delivery time stock which is the Inventory needed during the lead time
15.	Berkah Swalayan (SME Market)	Al-Husaini et al.	2018	Information system of business and forecasting on sales, low-cost purchases, and minimize inventory.	Conducive business environment needs to be further enhanced to foster innovative and creative SMEs that would become competitive amidst the challenges of the global market.

3.2 EMPATHY MAP

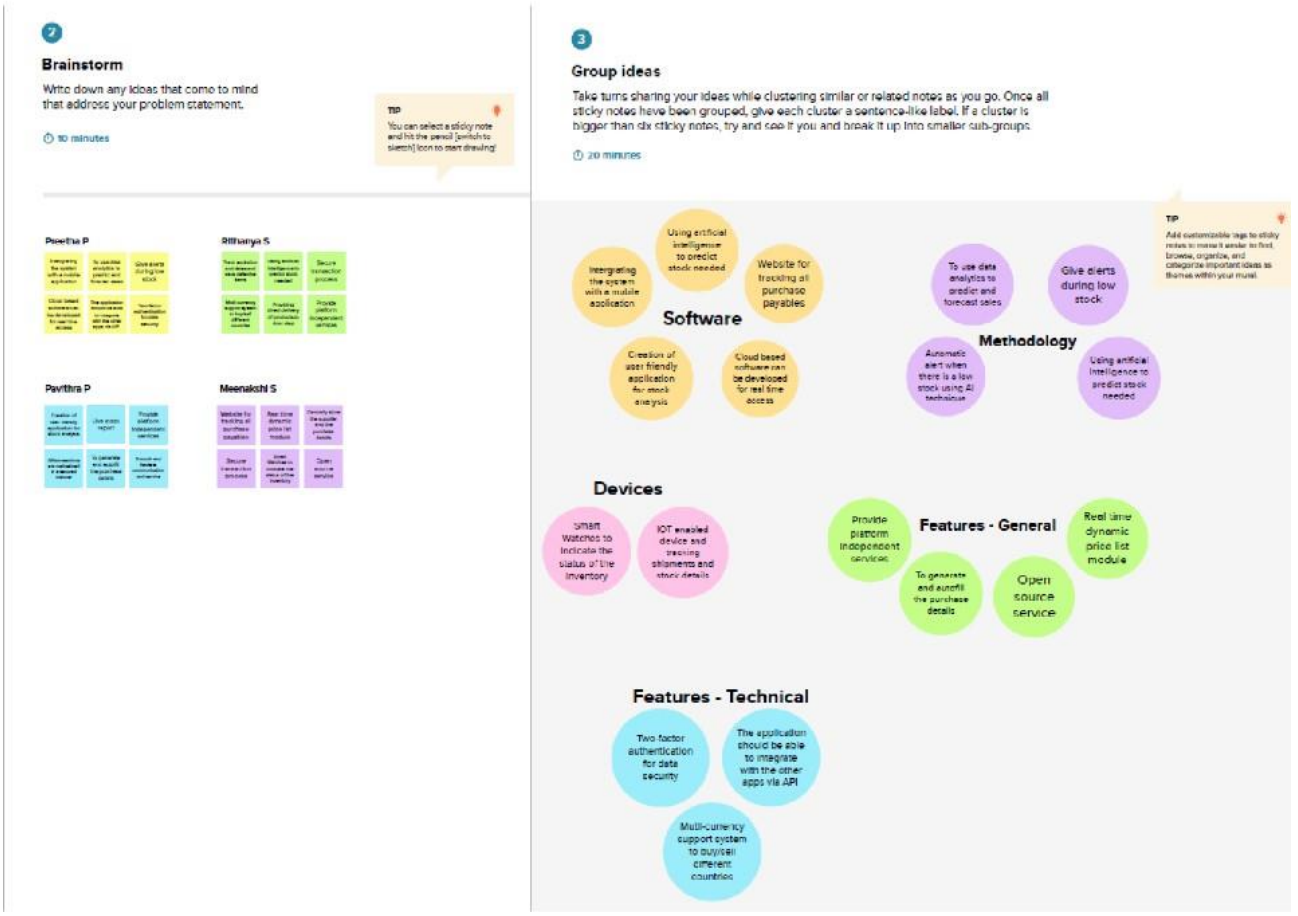


3.3 IDEATION PHASE

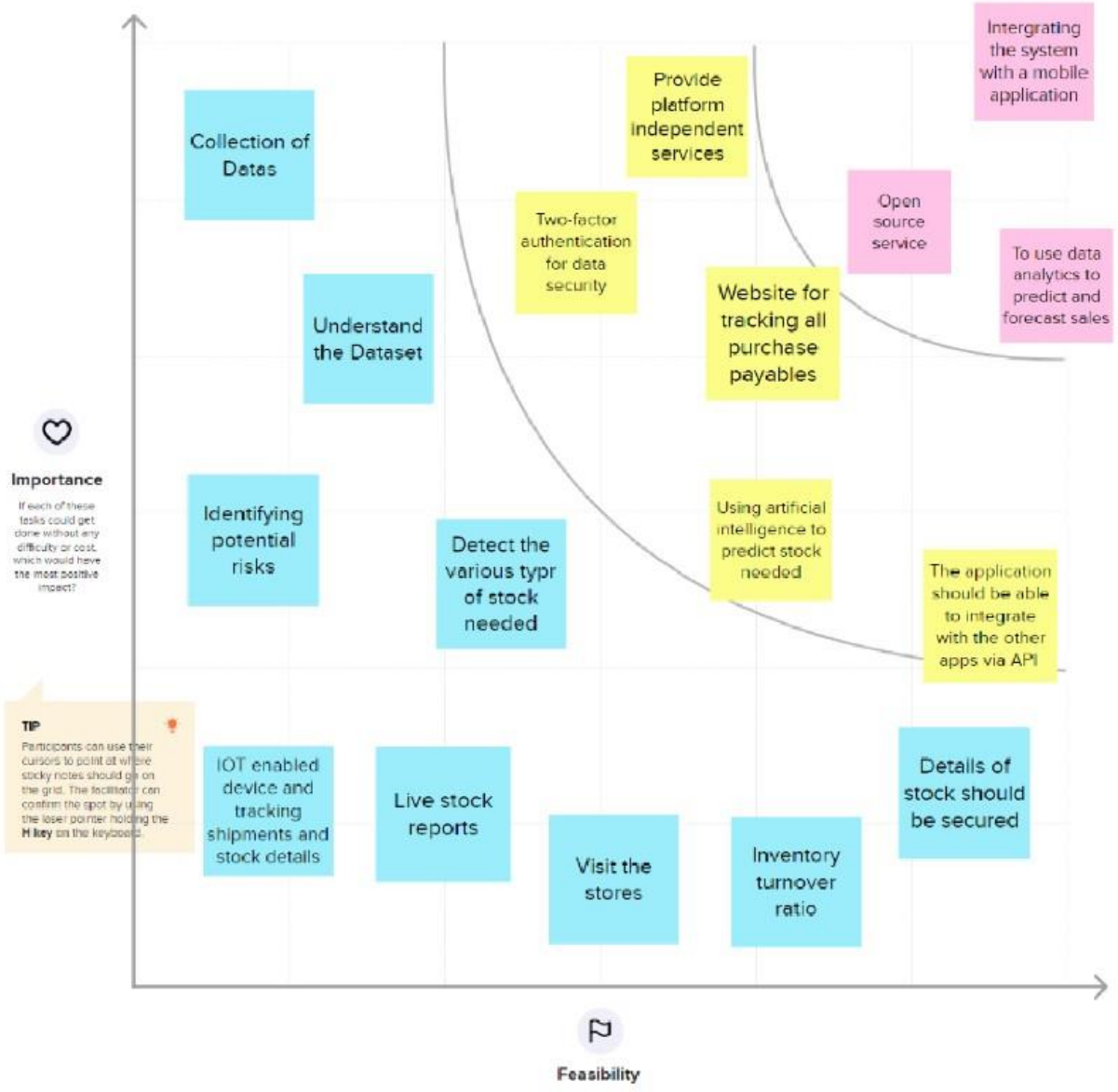
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



3.4 PROBLEM STATEMENT

Customer Problem Statement:

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Retailer	Analyse the monthly sales	Manual calculation doesn't produce accurate results	Human may commit mistakes	confused
PS-2	Supplier	Supply goods to local shops	unable to satisfy the need of stocks	Due to insufficient storage capacity and change in demands	Hopeless
PS-3	Retailer	sell/buy stocks	Leads to loss	Insufficient knowledge in stock management	Frustrated

4.PROJECT DESIGN PHASE 1

4.1 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	In order for merchants to meet customer demand without running out of inventory or carrying an excess supply, a retail store stock inventory management system must be developed. The retail store's issue is that they don't have a structured system in place to record and maintain their inventory data. Because they only record the inventory data in the logbook and are not properly organised, the admin finds it challenging to record the data promptly and safely.
2.	Idea / Solution description	Analytics for retail shop stock inventories are used to examine a retailer's historical sales data. With the use of python packages like pandas, a thorough grasp of the dataset, and the use of IBM Cognos analytics to construct stock inventory visualisations and useful dashboards, we were able to find patterns, links, and connections. Retailers can benefit from the final dynamic dashboard's complete product listing, simple categorization, inventory reports that fulfil customer expectations, and ability to adapt to changing product demand.
3.	Novelty / Uniqueness	• Easy Understanding of data visualization. • Ease of Handling the data • Time saving and provides neat analytics.
4.	Social Impact / Customer Satisfaction	• It provides easy visualization of IN and OUT stock, so it maintains the business in good balance. • Helps to attain better profit.
5.	Business Model (Revenue Model)	Advertisement-based model Both offline and internet enterprises can use the advertisement-based revenue model. Websites, applications, markets, and other online resources with high traffic volumes commonly incorporate it. Selling and advertising space brings in money.
6.	Scalability of the Solution	With the data saved in the retail stores, stock inventory may be anticipated with ease. It provides the best user experience and keeps the facts up to date.

4.2 PROBLEM SOLUTION FIT

Project Title: RETAIL STORE STOCK INVENTORY ANALYTICS Project Design Phase-I – Solution Fit Team ID: PNT2022TMID09334

Define CS, fit into CL

1. CUSTOMER SEGMENT(S) CS

Customer can be any retailers (both new and old retailers)

6. CUSTOMER LIMITATIONS EG. BUDGET, DEVICES CL

- Cost constraints
- Availability of Required Devices
- Internet connections
- Electricity issue

5. AVAILABLE SOLUTIONS PLUSES & MINUSES AS

The unexpected shifts in demand, which are closely correlated to price increases, can be anticipated and supplied accordingly. People have tried to forecast price increases and decreases based solely on their own personal experience.

Explore AS, differentiate

Focus on PR, tap into BE, understand RC

2. PROBLEMS / PAINS + ITS FREQUENCY PR

- Wastage of excess order for goods
- Shortage of goods
- Locating the nearer warehouse for restocking
- The transportation cost
- Sudden hike in demand-based products.

9. PROBLEM ROOT / CAUSE RC

- Maintaining stock and having a clear picture when forecasting the inventory are the key driving forces behind this stock inventory management.
- This analytical endeavor unquestionably lowers the percentage of stock ignorance and aids in forecasting.

7. BEHAVIOR + ITS INTENSITY BE

- It aims to make a record of available stocks.
- It aids in inventory management.
- It is simple to use.

Focus on PR, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS TO ACT TR

Every retailer hopes to turn a profit. As a result, they are motivated to employ this kind of analysis so they may decide more wisely about the stock inventory system.

4. EMOTIONS BEFORE / AFTER EM

BEFORE: Inconsistent stock levels.
AFTER: Controls the amount of inventory needed, and we may compute the profits and losses.

10. YOUR SOLUTION SL

- It is simple to analyze the business and we may take better business decisions by creating various sorts of charts.
- The major goal is to manage the inventory system, which means that there shouldn't be any excess or insufficient goods.
- It can be completed extremely quickly and successfully.

8. CHANNELS of BEHAVIOR CH

ONLINE

It can be utilized both online and offline. The double mode operating system is made with user-friendliness in mind.

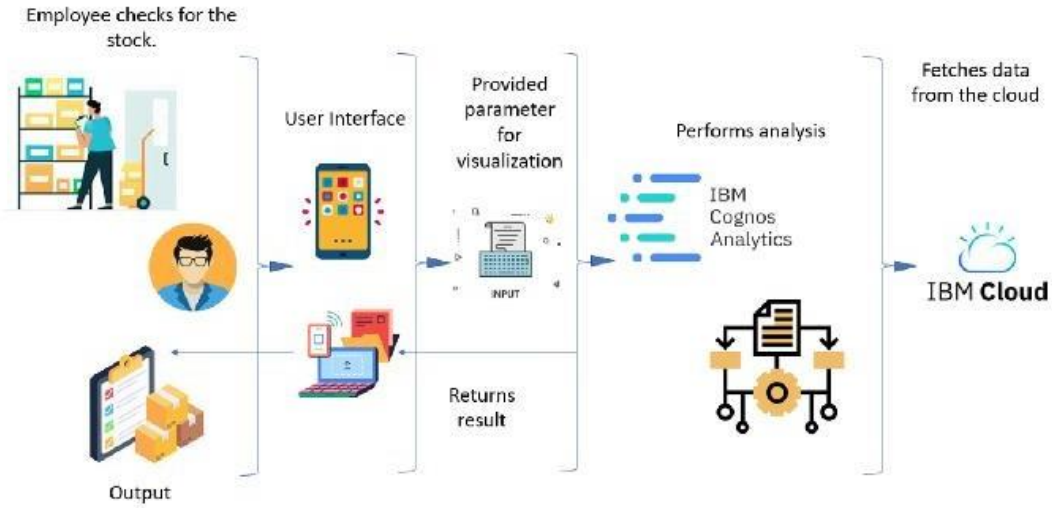
OFFLINE

To ensure that stocks don't remain excessive, the inventory system can be analyzed in offline mode.

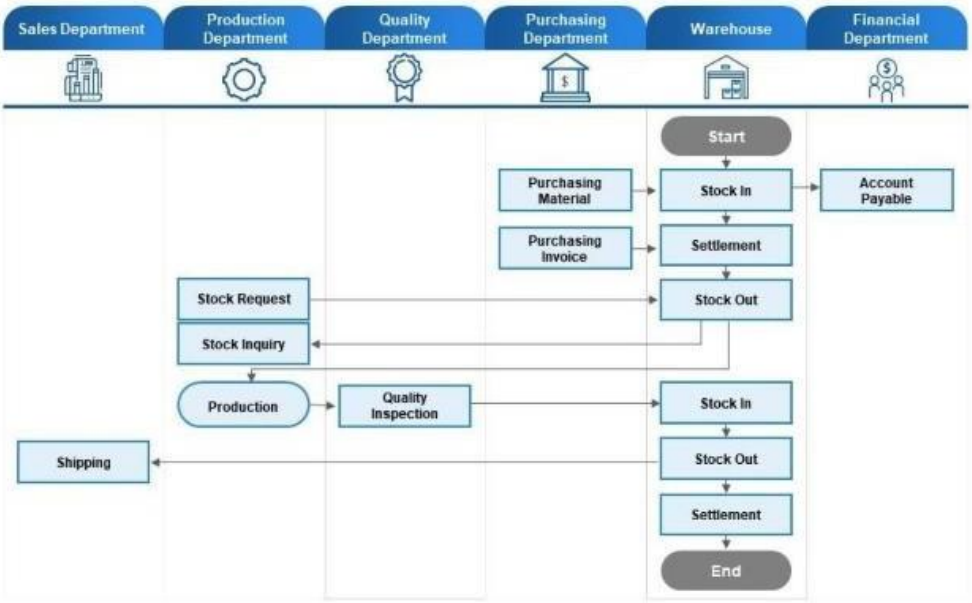
Extract online & offline CH of BE

4.3 SOLUTION ARCHITECTURE

SOLUTION ARCHITECTURE

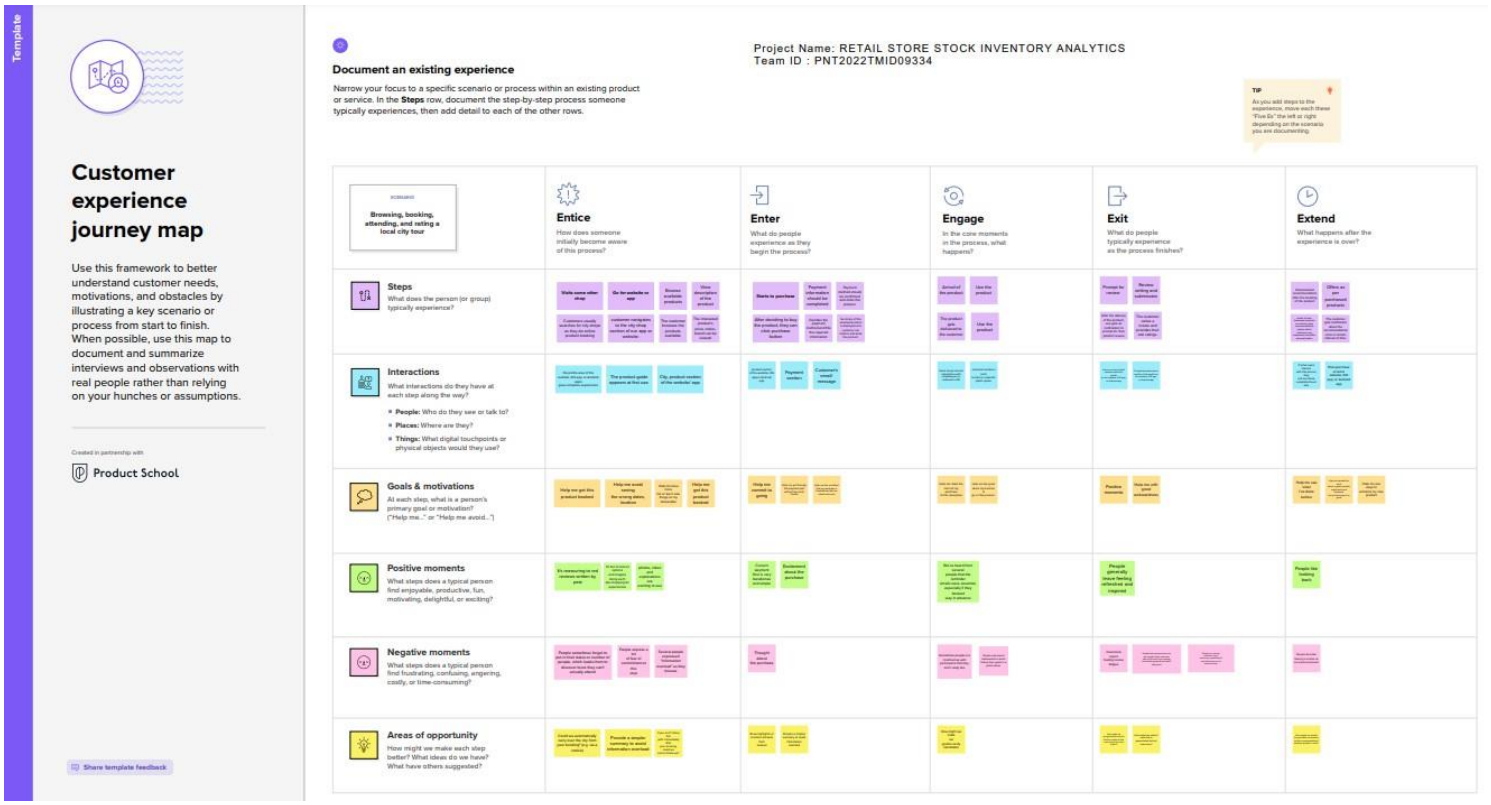


PROCESS FLOW OF RETAIL STORE STOCK INVENTORY MANAGEMENT



5.PROJECT DESIGN PHASE 2

5.1 CUSTOMER JOURNEY MAP



5.2 SOLUTION REQUIREMENTS

Functional Requirements

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6.	Scalability of the Solution	With the data saved in the retail stores, stock inventory may be anticipated with ease. It provides the best user experience and keeps the facts up to date.

Non-functional Requirements:

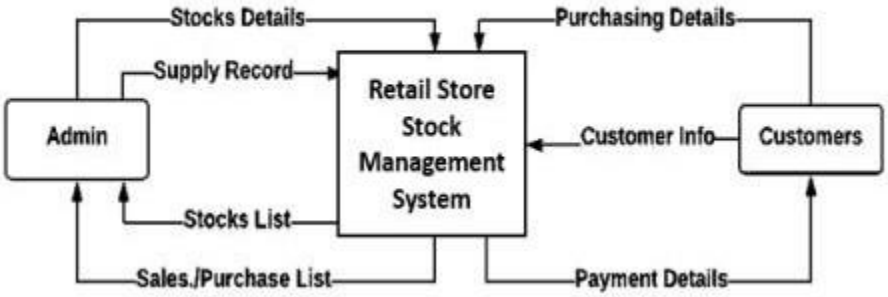
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	They seem to be more likely to avoid overstocking and save costs while maintaining a enough inventory to capture every potential transaction. Mobile and desktop browsers may both support this concept.
NFR-2	**Security**	Only users with the right login credentials may use this.
NFR-3	**Reliability**	• Do not overstock or understock. • Make sure inventory valuations are accurate. • Stop order delays • minimise dead stock
NFR-4	**Performance**	• A retail shop uses a digital billing system. The customer database, which includes the customer's name, phone number, address, and purchase information, is included in the dataset. • The model can forecast both dead stocks and extremely successful stocks based on this. This model's accuracy will be checked several times to be sure.
NFR-5	**Availability**	• All types of retail stores can use this concept. It can provide retailers with real-time stock visibility, help them avoid stock outs, and keep their inventory carrying costs low. • Assists in satisfying client demands
NFR-6	**Scalability**	There are no problems when more users are logged in at once. The user's feedback will be considered and furthered till the user is satisfied.

5.3 DATA FLOW DIAGRAM

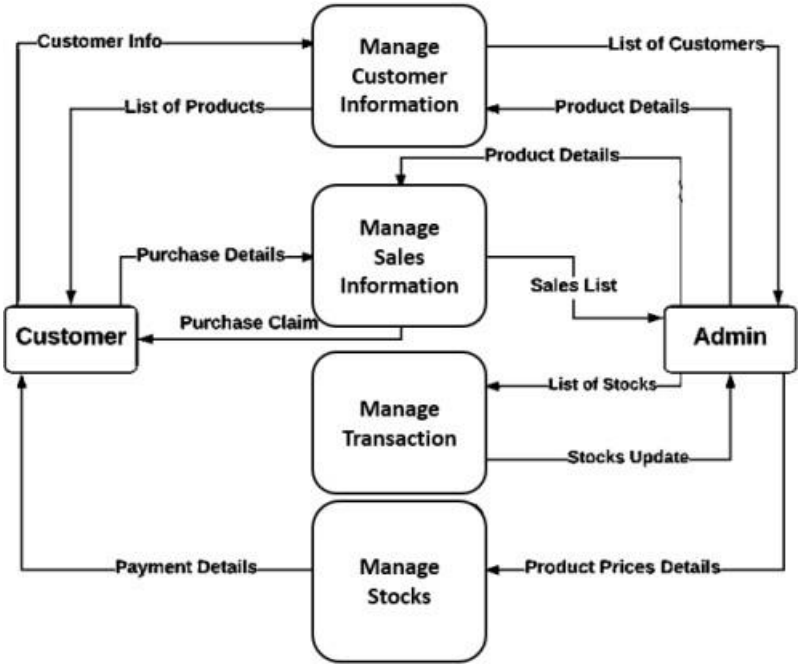
Data Flow Diagram:

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.

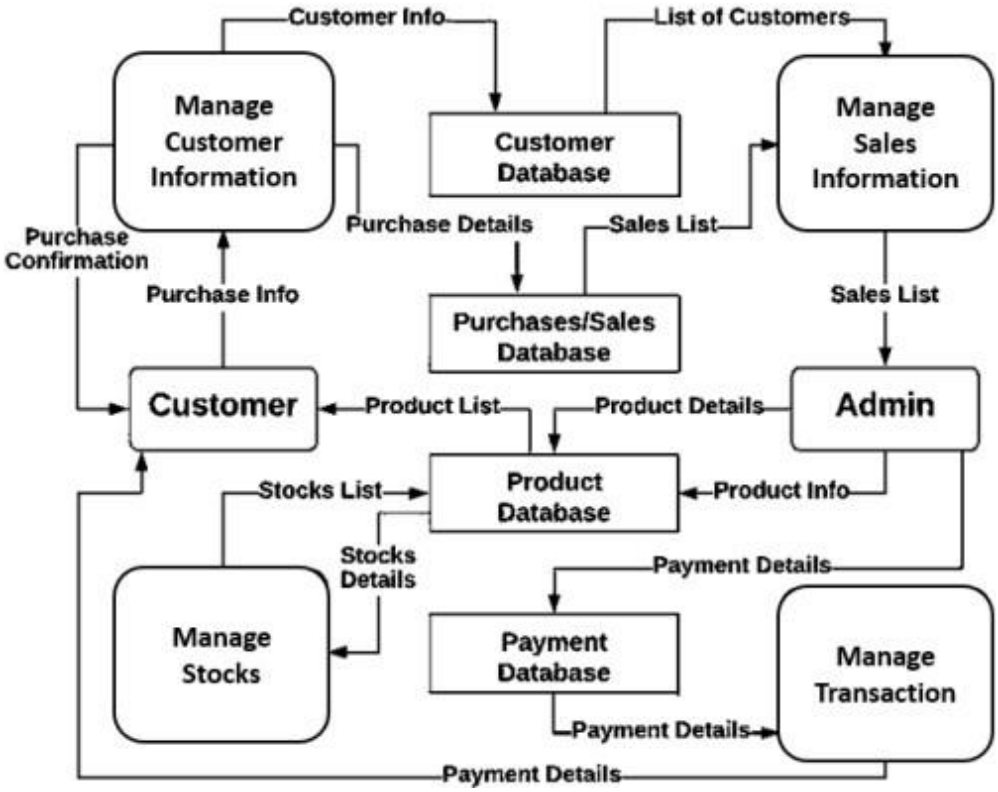
DFD LEVEL 0



DFD LEVEL 1



DFD LEVEL 2


Customer Info
List of Customers
Manage Customer Information
Customer Database
Manage Sales Information
Purchase Details
Sales List
Purchase Confirmation
Purchase Info
Purchases/Sales Database
Sales List
Customer
Product List
Product Details
Admin
Product Database
Stocks List
Product Info
Stocks Details
Payment Details
Manage Stocks
Payment Database
Manage Transaction
Payment Details
Payment Details

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Custom er (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, 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 application throughFacebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application throughGmail	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 enteringemail & password after installing the web application.	I can access the dashboard bylogin 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 myretail store.	High	Sprint-1
Customer (Webuser)		USN-1	As a user, I can register for the web application 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
Administrator		USN-3	As a user, I can register for the application throughFacebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register & access the dashboard with Gmail login	Medium	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
	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 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 and 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 and they are also responsible for updating and maintaining the data	HIgh	Sprint-2

5.4 TECHNOLOGY STACK

Technical Architecture:

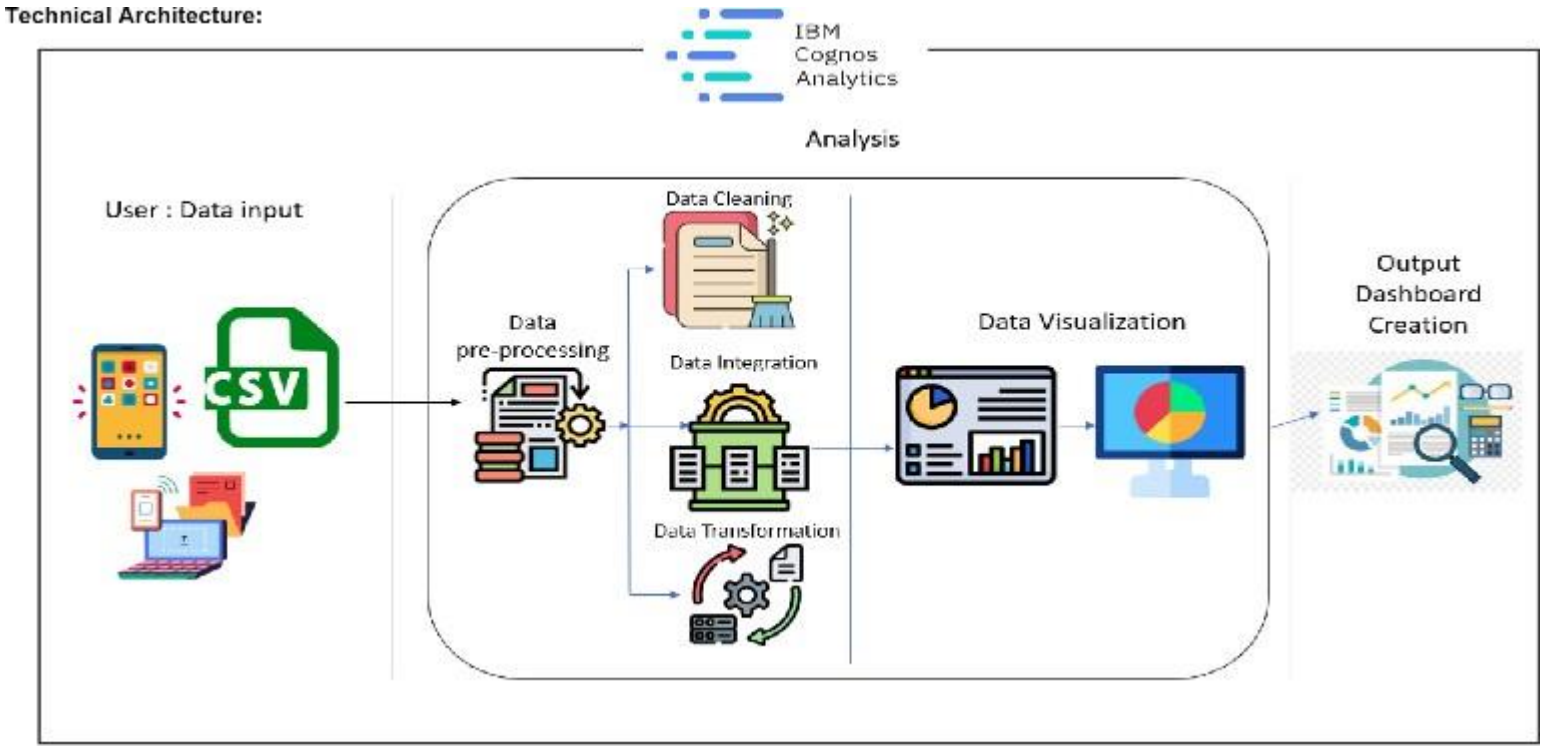


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Using Web UI, the user engages with theprogramme.	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	The best strategy to create the goods in the storeis predicted using the algorithmic strategies.	ML algorithms –Logistic Regression, Linear Regression, Random Forest,ABC Techniques.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	utilised open-source frameworks	IBM Cognos Analytics, Python
2.	Security Implementations	use of encryptions while requesting authentication	Encryptions
3.	Scalable Architecture	Three tiers make up scalability.	Web Server – HTML, CSS, JavaScriptApplication Server – Python Database Server – IBM Cloud
4.	Availability	The application is available for cloud users	IBM Cloud Hosting

6. Project planning phase

6.1 PREPARE MILESTONE AND ACTIVITY LIST

Milestones and Activities:

MILESTONES	ACTIVITIES
Registration	• Login into Dashboard
Dashboard	• View Stocks • Perform Predictions • Search Products
Product	• View Products • Add Products • Delete Products
Visualization	• Report generation • Out of stock prediction • In stock prediction
Edit Stock	• Reorder/ Update Stock
Invoice and Discount	• Invoice generation and discount validation

6.2 SPRINT DELIVERY PLAN

Product backlogs, Sprint schedule, Estimation(4 marks)

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 byentering my email, password, and confirming my password.	2	High	Rithanya S,Meenakshi S
Sprint-1	Confirmation	USN-2	As a user, I will receive confirmation email onceI have registered for the application	1	High	Rithanya S,Meenakshi S
Sprint-2	Registration through Facebook	USN-3	As a user, I can register for the applicationthrough Facebook	2	Low	Rithanya S,Meenakshi S
Sprint-1	Registration throughGmail	USN-4	As a user, I can register for the applicationthrough Gmail	2	Medium	Rithanya S,Meenakshi S
Sprint-1	Login	USN-5	As a user, I can log into the application byentering email & password	1	High	Rithanya S,Meenakshi S
Sprint-2	Dashboard	USN-6	As a user, I can view my dashboard and canperform stock prediction and analysis	3	High	Preetha P, Pavithra P, Meenakshi S
Sprint-2	View list of stocks	USN-7	As a user I can view the list of categorizedproducts and their details	4	High	Rithanya S,Preetha P
Sprint-2	Search products	USN-8	As a user I can search through the product usingbarcode	2	Medium	Rithanya S, Preetha P
Sprint-3	Report generation	USN-9	As a user I can generate reports based onproduct sales	5	High	Meenakshi S,Pavithra P
Sprint-3	Stock Prediction	USN-10	As a user I can predict out of stock and lessstock for a product	5	High	Meenakshi S,Pavithra P
Sprint-4	Notification system	USN-11	As a user I can view notification for expired andout of stock products	4	High	Rithanya
Sprint-4	Re-Ordering stock	USN-12	As a user I can reorder stocks based onpredictions and notification	3	High	Preetha P, Meenakshi S
Sprint-2	Updating stock	USN-13	As a user I can add/delete products	5	High	Rithanya S, Pavithra P, PreethaP
Sprint-4	Invoice generation	USN-14	As a user I can generate invoice calculatingtaxes, discount and calculate credits	4	High	Meenakshi
Sprint-4	Discount system	USN-15	As a user I can provide discount based on creditpoints	3	Medium	eenakshi

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	The dataset is collected and the understanding of dataset is done to present the analyticsto the user	2	High	Pavithra M Pooranapushpakala MSmiwin Gems Suriya Lakshmi A
Sprint-1	Data Preparation	USN-2	As a user, I can viewthe accurate analytics of data by prepared data. The data preparation is done to restructure and clean the data.	3	High	Pavithra M Pooranapushpakala MSmiwin Gems Suriya Lakshmi A
Sprint-2	Data Exploration	USN-3	As a user, I can viewthe visualized data to get the better understanding about the sales, stock, revenue and price.	8	High	Pavithra M Pooranapushpakala MSmiwin Gems Suriya Lakshmi A
Sprint-3	Dashboard Creation	USN-4	As a user, I can viewthe different visualization in the dashboard about the sales, stock, revenueand price.	8	High	Pavithra M Pooranapushpakala MSmiwin Gems Suriya Lakshmi A
Sprint-4	Report creation	USN-5	As a user, I can view the detailed report of the sales, stock, revenue and price. The user can get the report of the particular data.	8	High	Pavithra M Pooranapushpakala M Smiwin Gems Suriya Lakshmi A
Sprint-4	Story creation	USN-6	As a user, I can view the story to get the better understanding of the sales, stock, revenue and price. The user can make decisions based onthe story.	8	High	Pavithra M Pooranapushpakala M Smiwin Gems Suriya Lakshmi A

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

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	24 Oct 2022	29 Oct 2022	6	29 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

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)

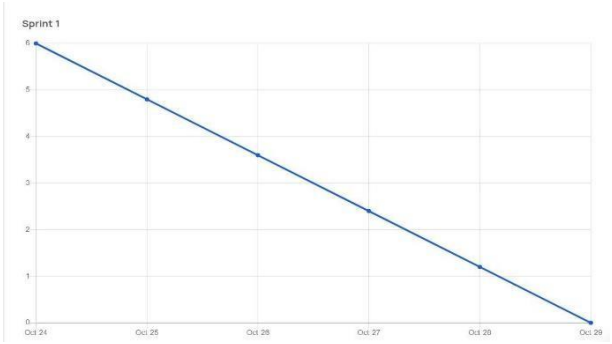
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

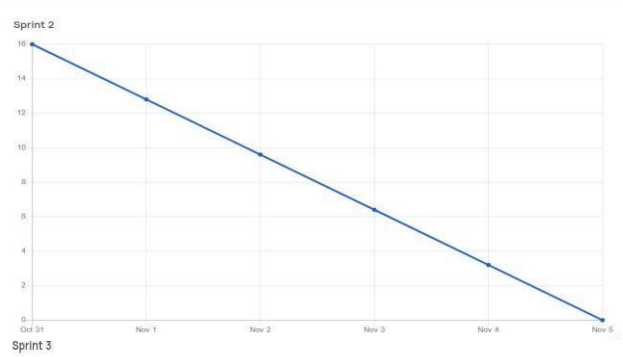
Sprint	Total Story Points	Duration	Average Velocity
Sprint-1	6	6 Days	6/6=1
Sprint-2	16	6 Days	16/6=2.67
Sprint-3	10	6 Days	10/6=1.67
Sprint-4	14	6 Days	14/6=2.33
Total	46	24	46/24=1.91

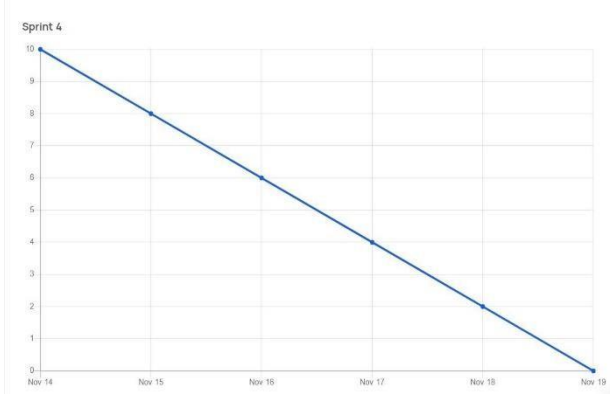
Burndown Chart:

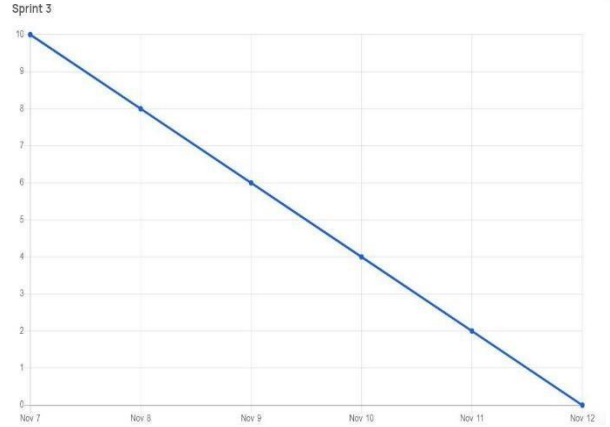
A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies suchas Scrum. However, burn down charts canbe applied to any project containing measurable progress over time.

Estimated Effort:

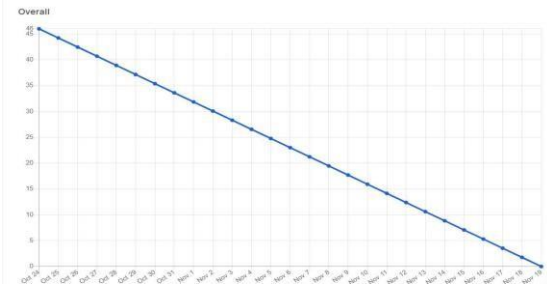




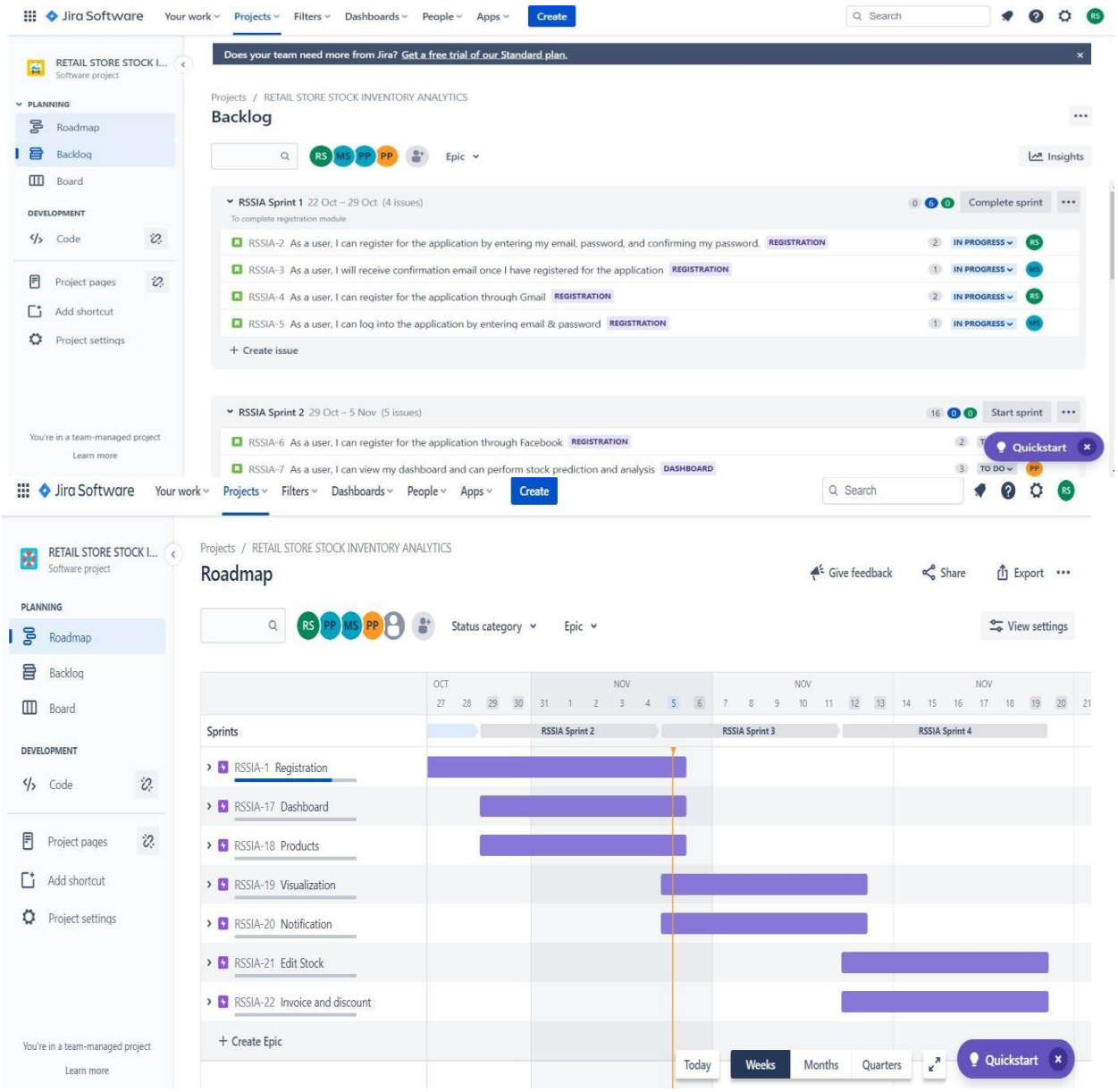




Overall burndown chart:



Project Planning Tool



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:

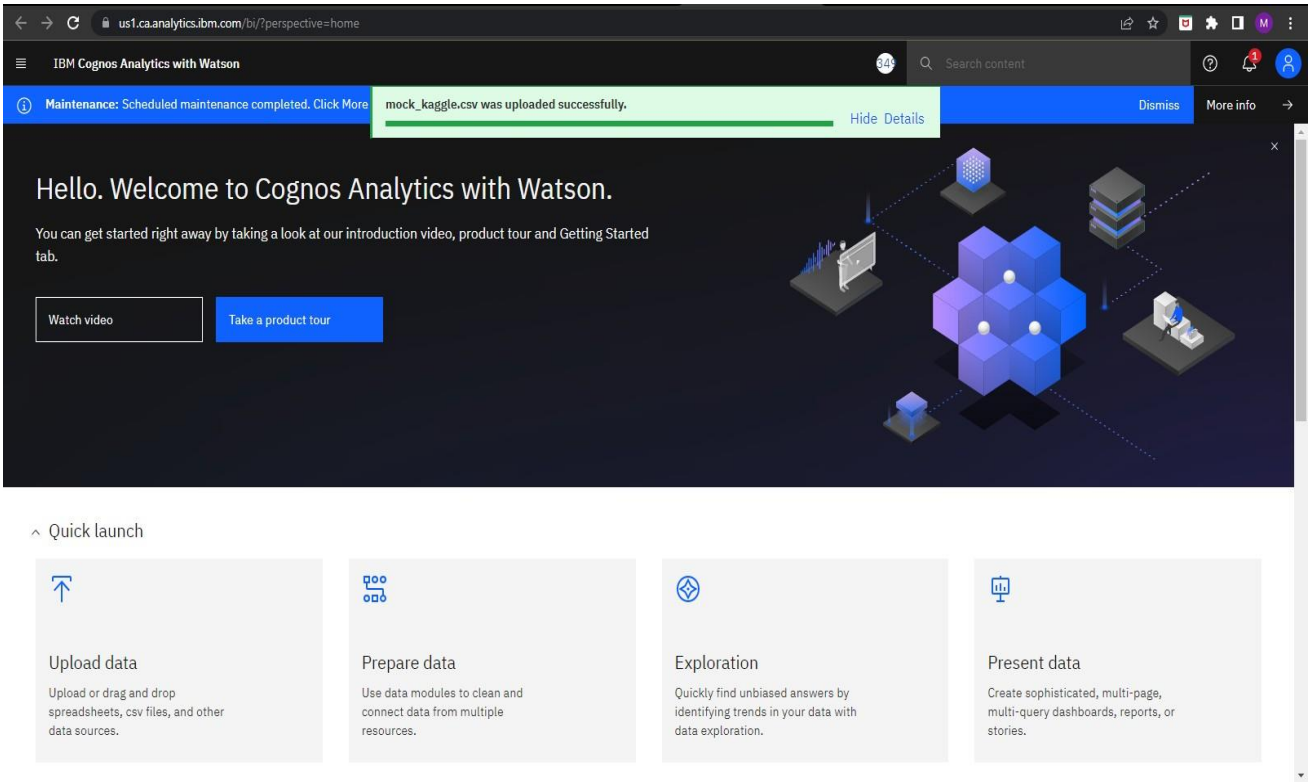
- ➢ Report Creation
- ➢ Story Creation

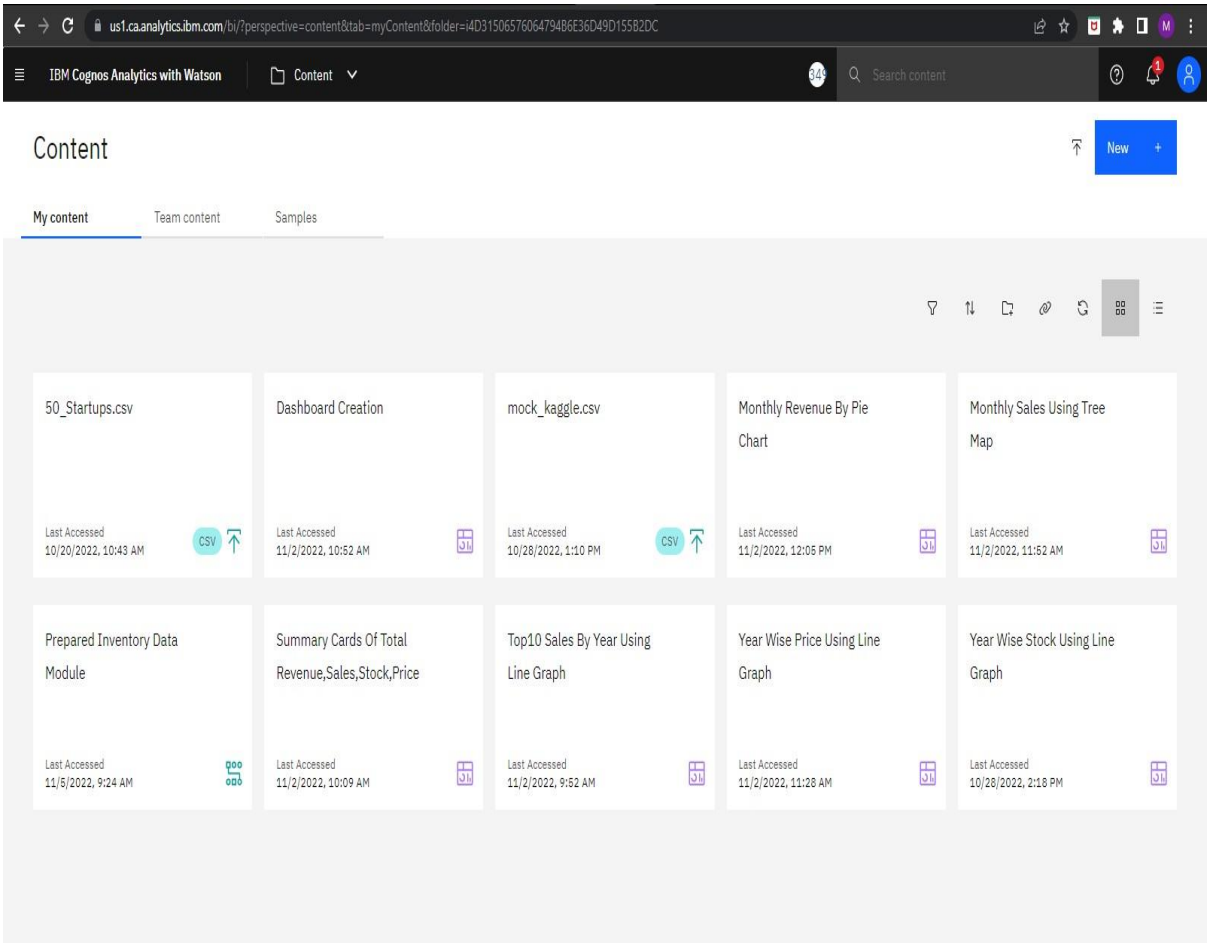
Data Collection

Download the Dataset

Dataset link: https://drive.google.com/drive/folders/1kiL-5CHJmQvbk9VyFsuUs-myAupBZGNy

Load the Dataset:





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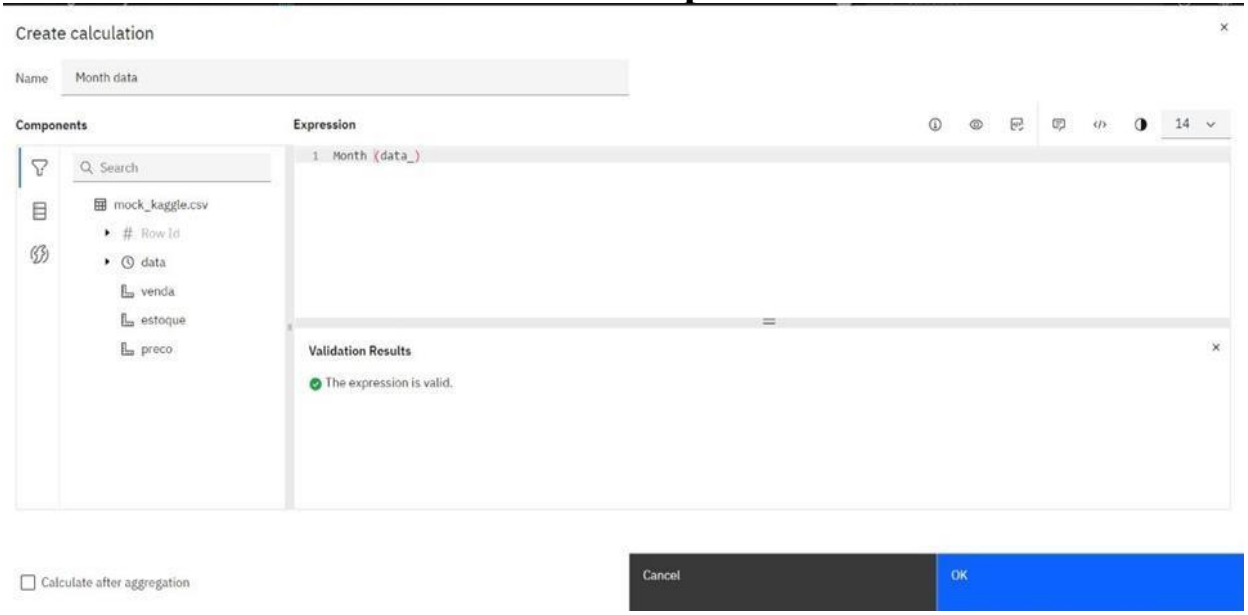

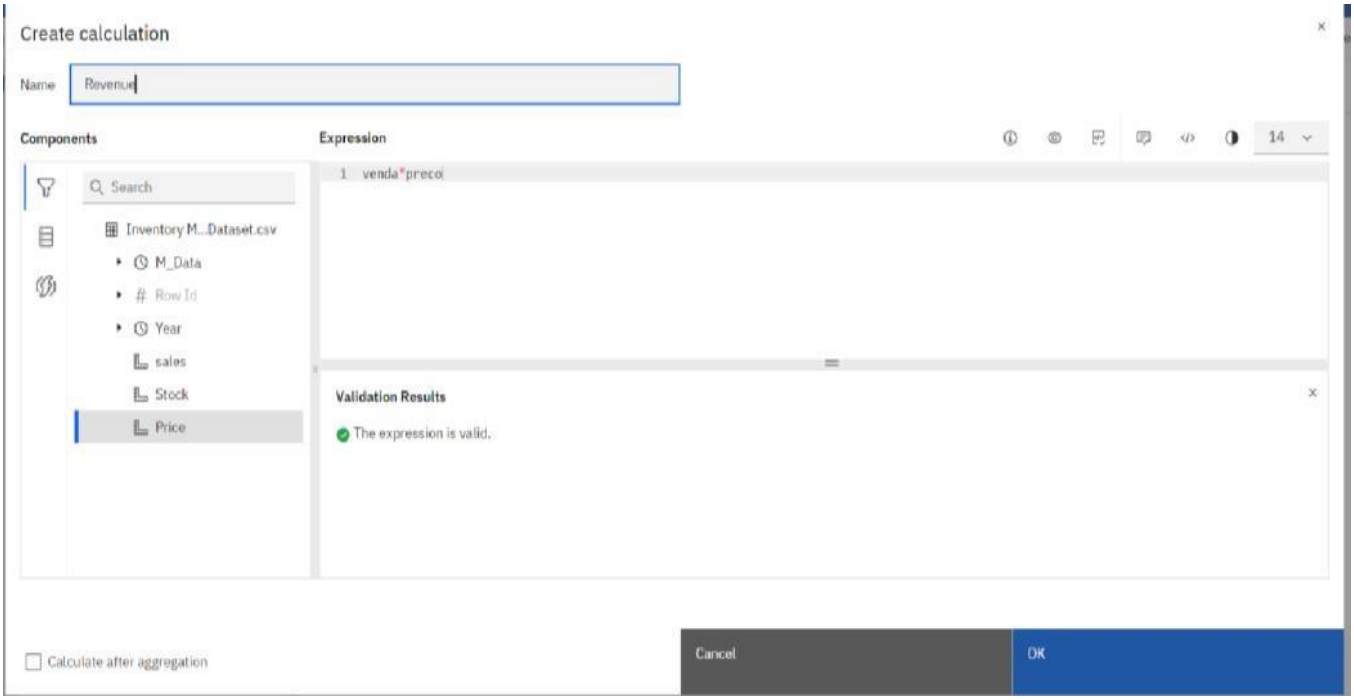
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Revenue
Components
Expression
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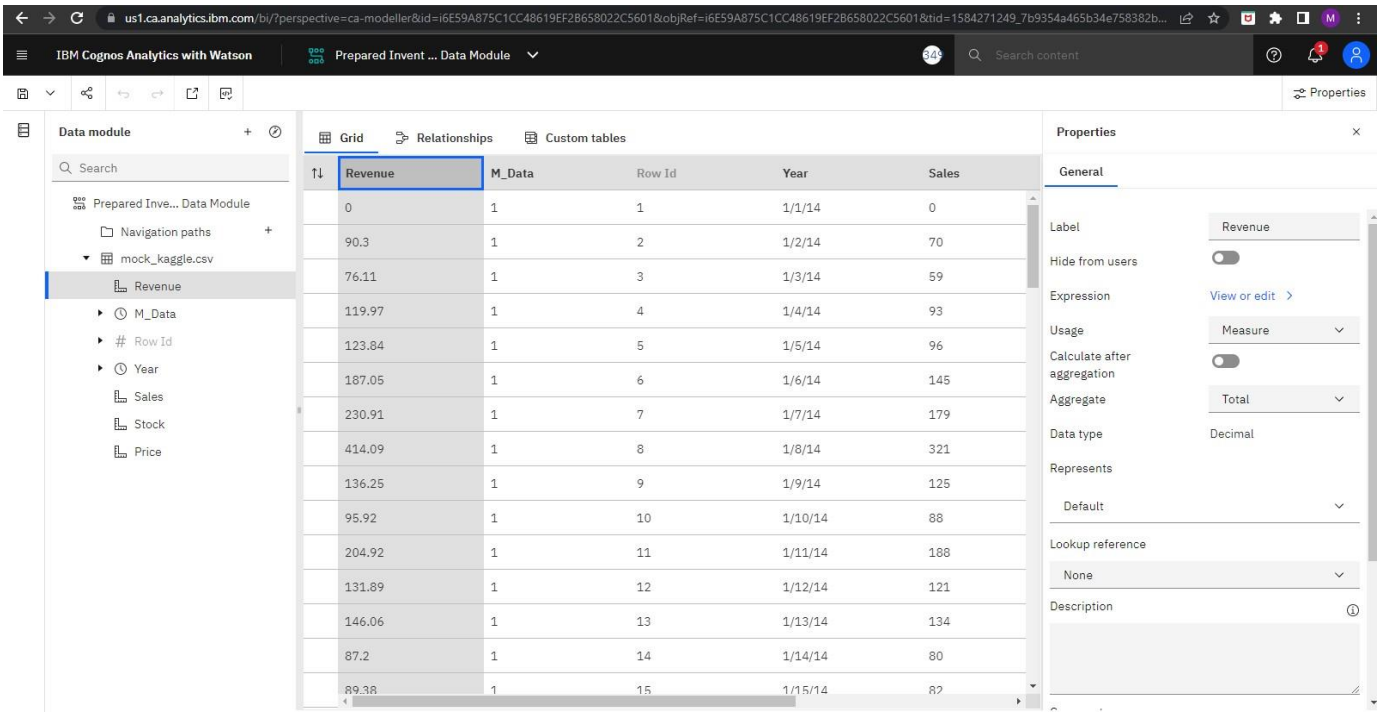
Inventory M...Dataset.csv
M_Data
Row Id
Year
sales
Stock
Price
1 venda*preco
Validation Results
The expression is valid.
Calculate after aggregation
Cancel
OK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Data module
Search
Prepared Inve... Data Module
Navigation paths
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M_Data
Row Id
Year
Sales
Stock
Price
Grid
Relationships
Custom tables
Revenue
M_Data
Row Id
Year
Sales
0 1 1 1/1/14 0
90.3 1 2 1/2/14 70
76.11 1 3 1/3/14 59
119.97 1 4 1/4/14 93
123.84 1 5 1/5/14 96
187.05 1 6 1/6/14 145
230.91 1 7 1/7/14 179
414.09 1 8 1/8/14 321
136.25 1 9 1/9/14 125
95.92 1 10 1/10/14 88
204.92 1 11 1/11/14 188
131.89 1 12 1/12/14 121
146.06 1 13 1/13/14 134
87.2 1 14 1/14/14 80
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General
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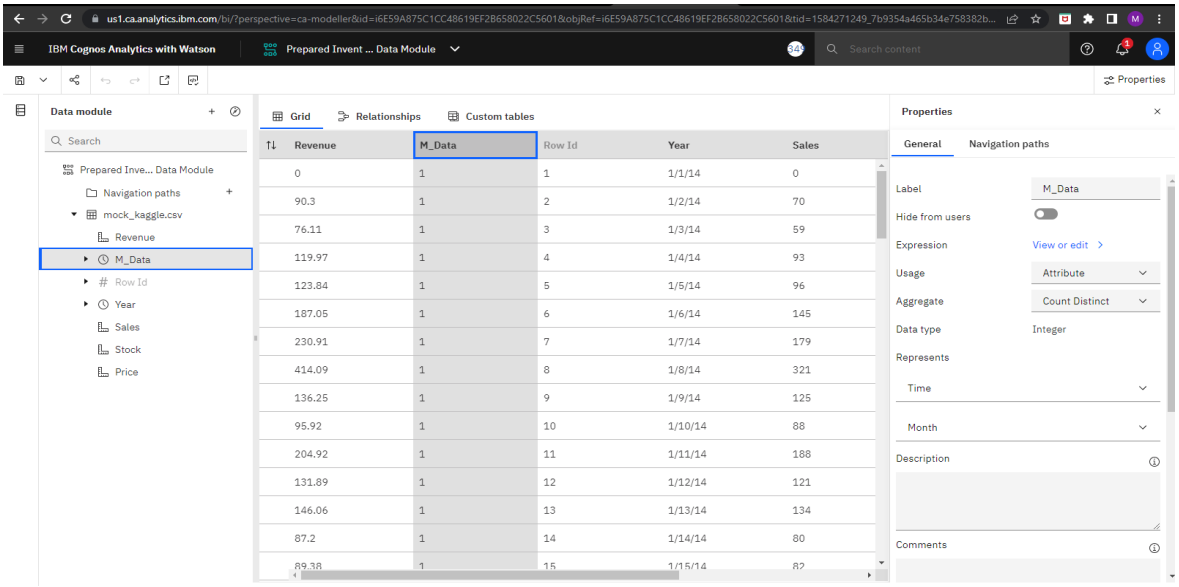
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Data type
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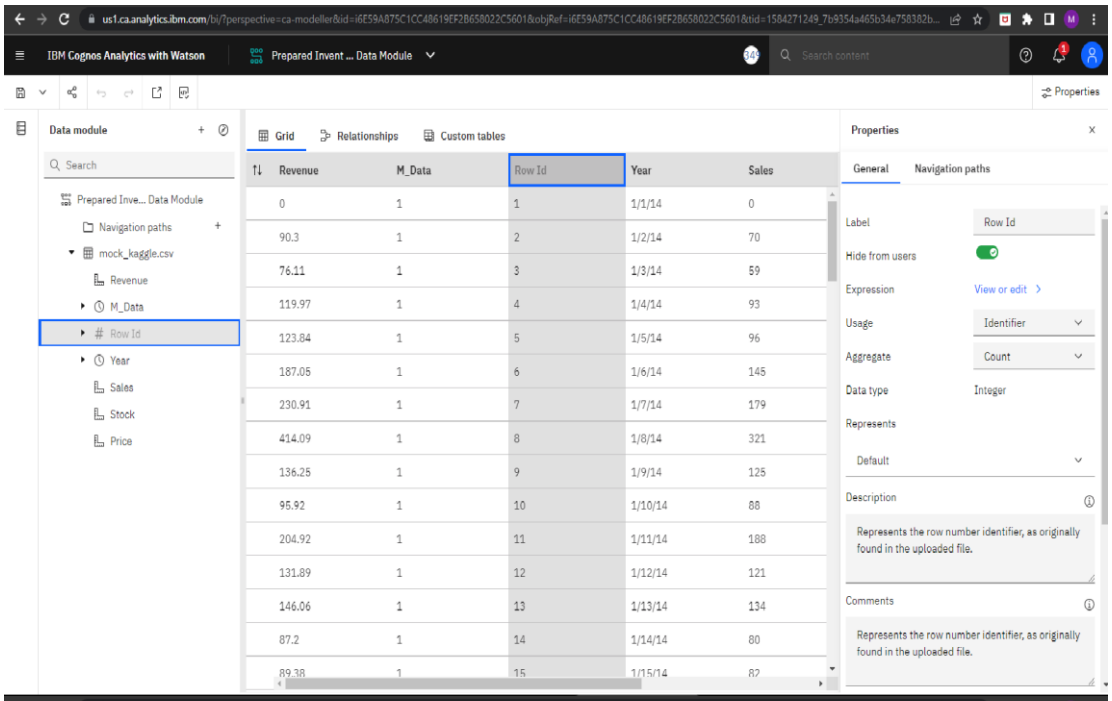
Represents
Time
Month
Description
Comments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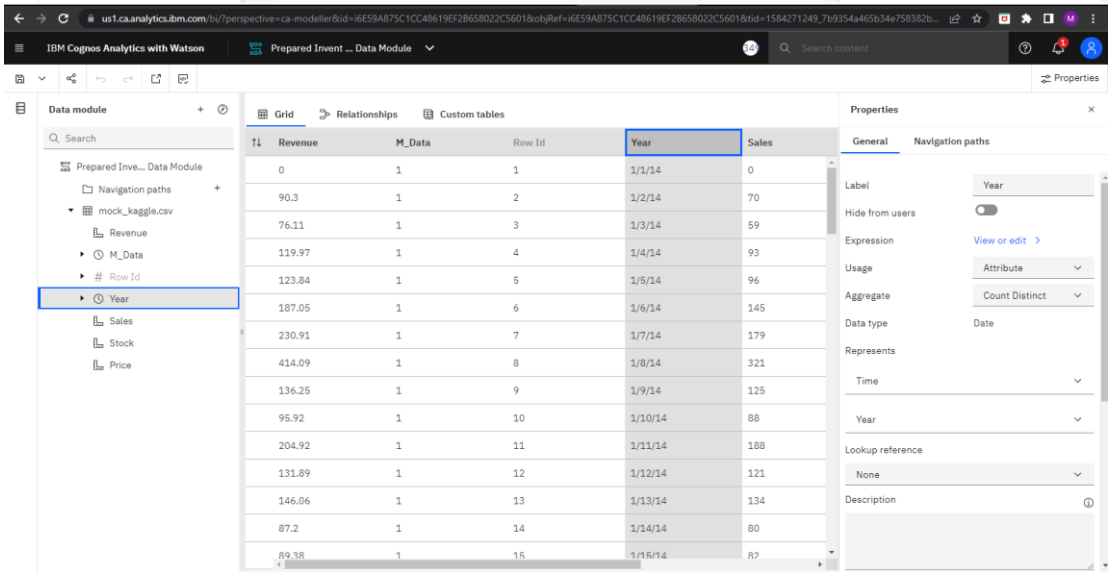
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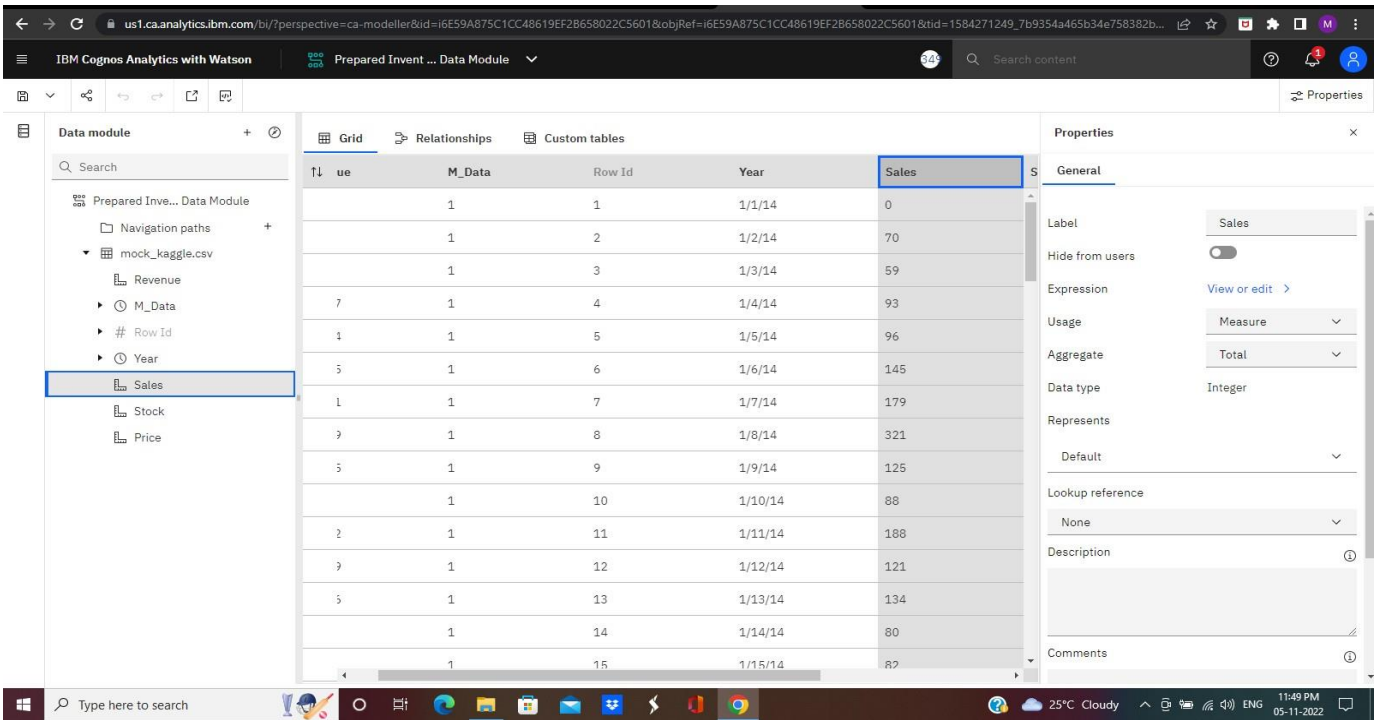
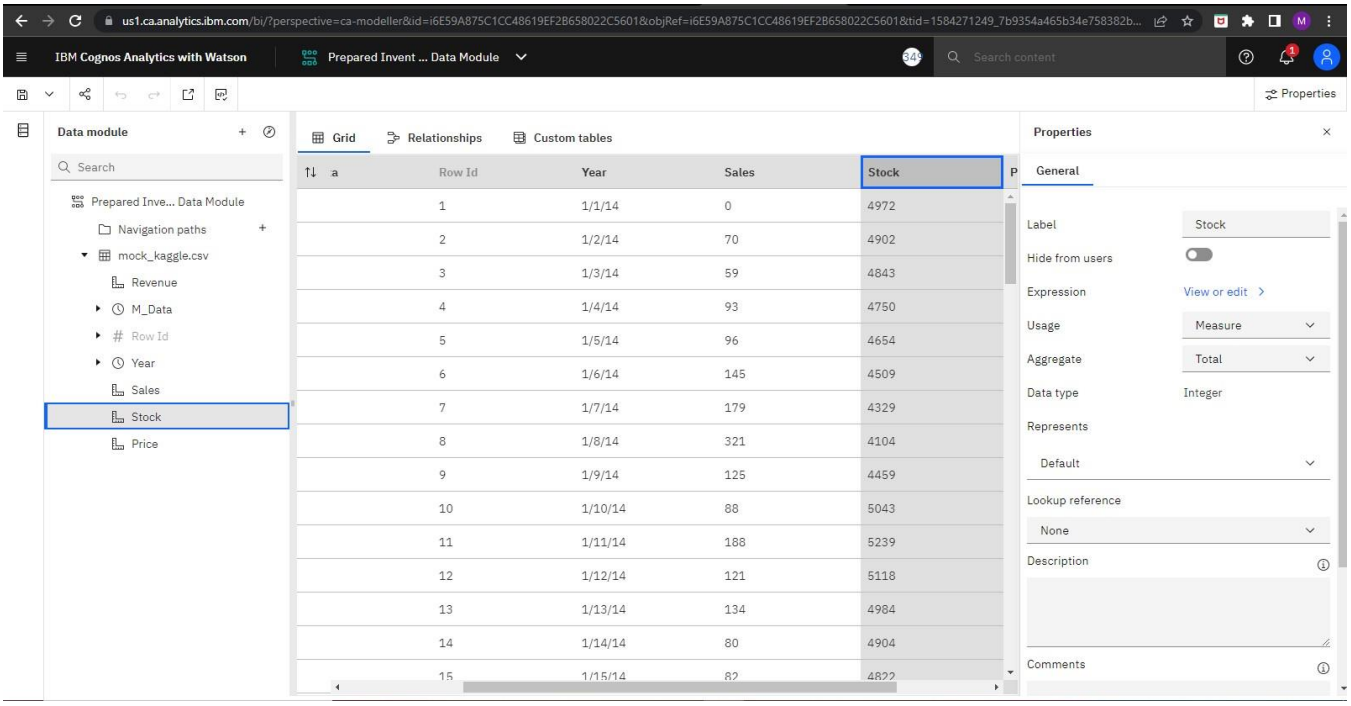
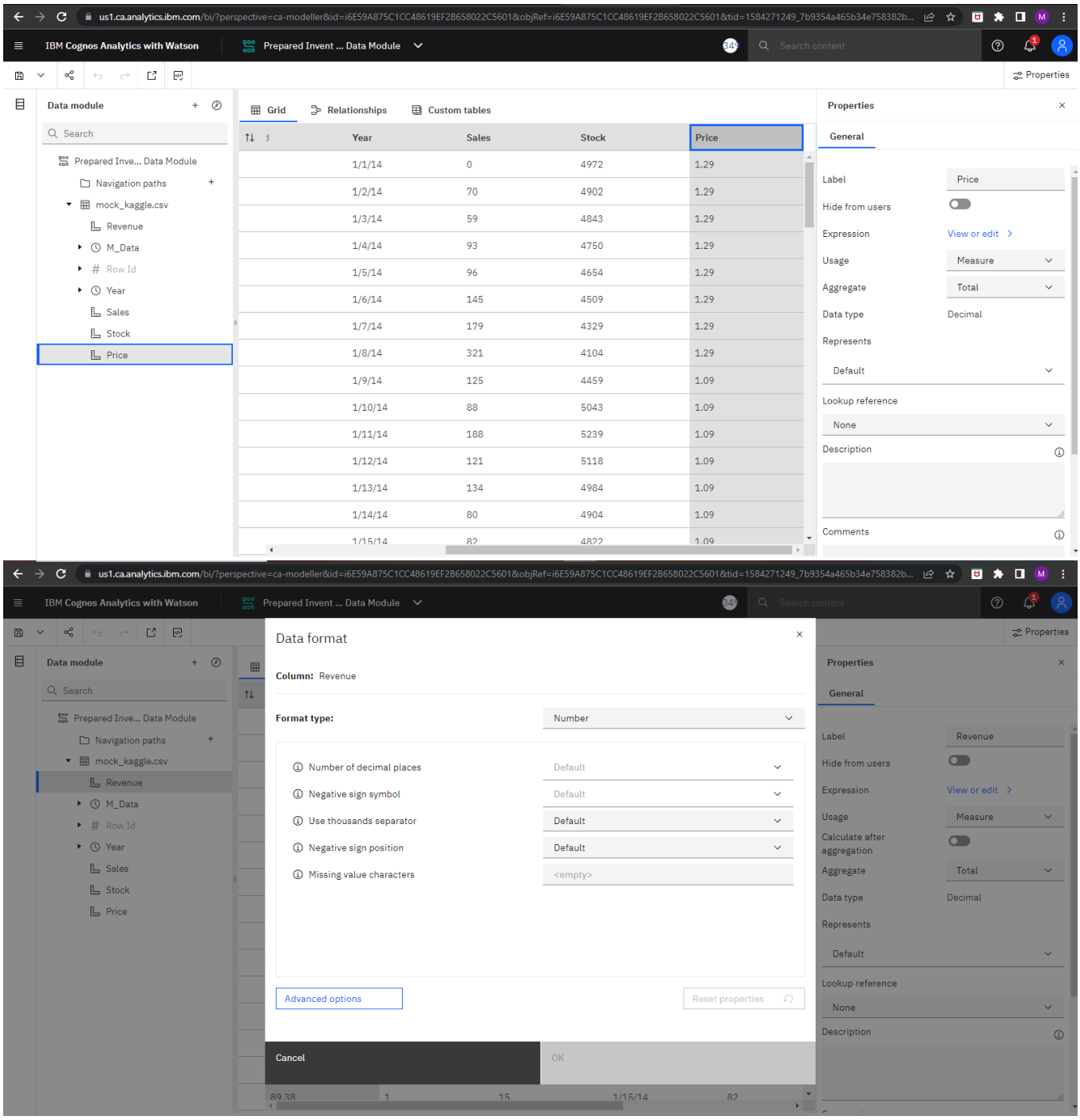


ue	M_Data	Row Id	Year	Sales
	1	1	1/1/14	0
	1	2	1/2/14	70
	1	3	1/3/14	59
7	1	4	1/4/14	93
1	1	5	1/5/14	96
5	1	6	1/6/14	145
1	1	7	1/7/14	179
9	1	8	1/8/14	321
5	1	9	1/9/14	125
	1	10	1/10/14	88
2	1	11	1/11/14	188
9	1	12	1/12/14	121
5	1	13	1/13/14	134
	1	14	1/14/14	80
	1	15	1/15/14	82



a	Row Id	Year	Sales	Stock
	1	1/1/14	0	4972
	2	1/2/14	70	4902
	3	1/3/14	59	4843
	4	1/4/14	93	4750
	5	1/5/14	96	4654
	6	1/6/14	145	4509
	7	1/7/14	179	4329
	8	1/8/14	321	4104
	9	1/9/14	125	4459
	10	1/10/14	88	5043
	11	1/11/14	188	5239
	12	1/12/14	121	5118
	13	1/13/14	134	4984
	14	1/14/14	80	4904
	15	1/15/14	82	4822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Revenue
M_Data
Row Id
Year
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Stock
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Custom tables
Year
Sales
Stock
Price
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1/2/14 70 4902 1.29
1/3/14 59 4843 1.29
1/4/14 93 4750 1.29
1/5/14 96 4654 1.29
1/6/14 145 4509 1.29
1/7/14 179 4329 1.29
1/8/14 321 4104 1.29
1/9/14 125 4459 1.09
1/10/14 88 5043 1.09
1/11/14 188 5239 1.09
1/12/14 121 5118 1.09
1/13/14 134 4984 1.09
1/14/14 80 4904 1.09
Properties
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Price
Hide from users
Expression
View or edit
Usage
Measure
Aggregate
Total
Data type
Decimal
Represents
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Lookup reference
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Format type:
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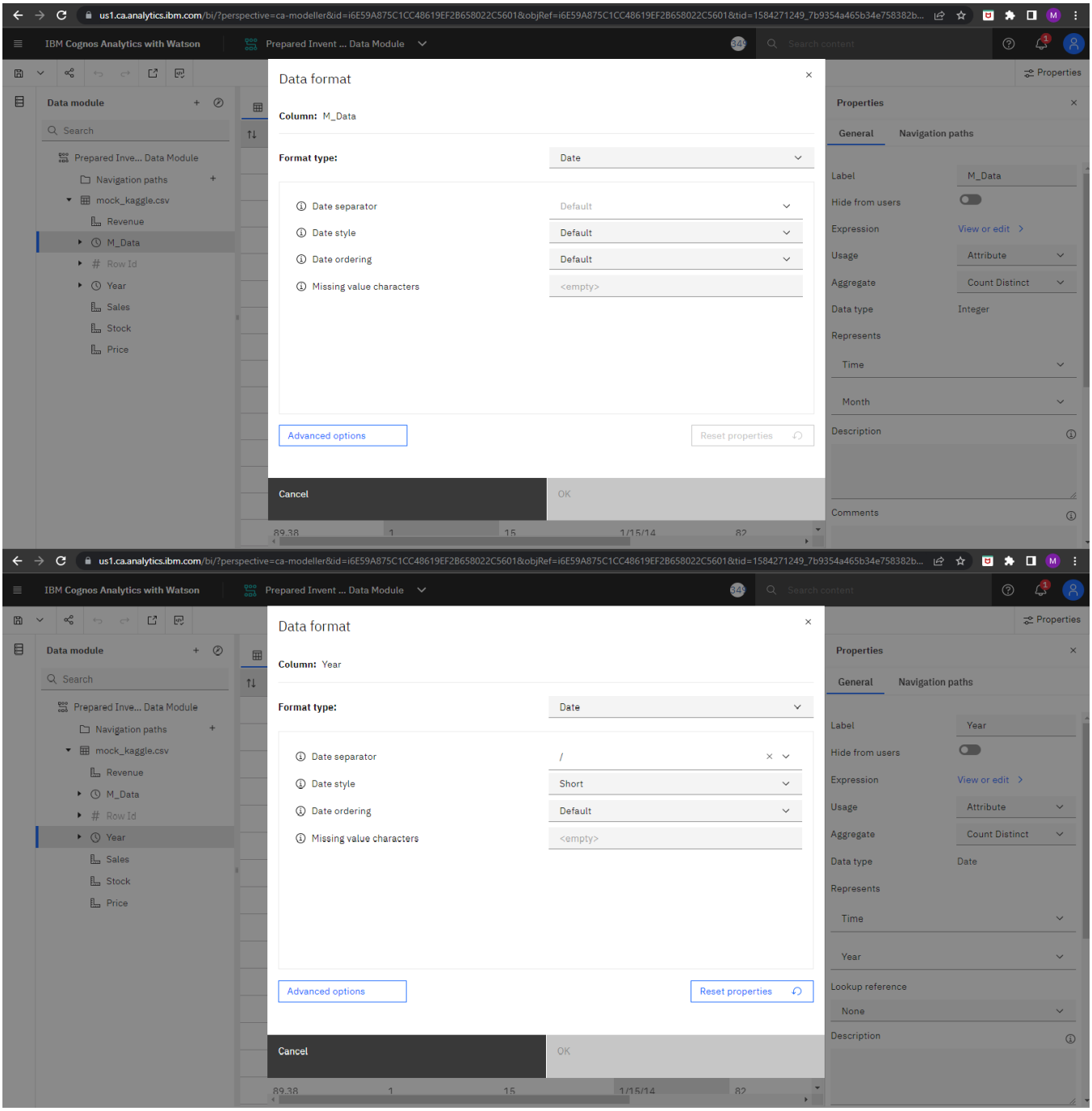
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Date style
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Date ordering
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Advanced options
Reset properties
Cancel
OK
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General
Navigation paths
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M_Data
Hide from users
Expression
View or edit
Usage
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Count Distinct
Data type
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Represents
Time
Month
Description
Comments
Data module
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Revenue
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Row Id
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Stock
Price
IBM Cognos Analytics with Watson
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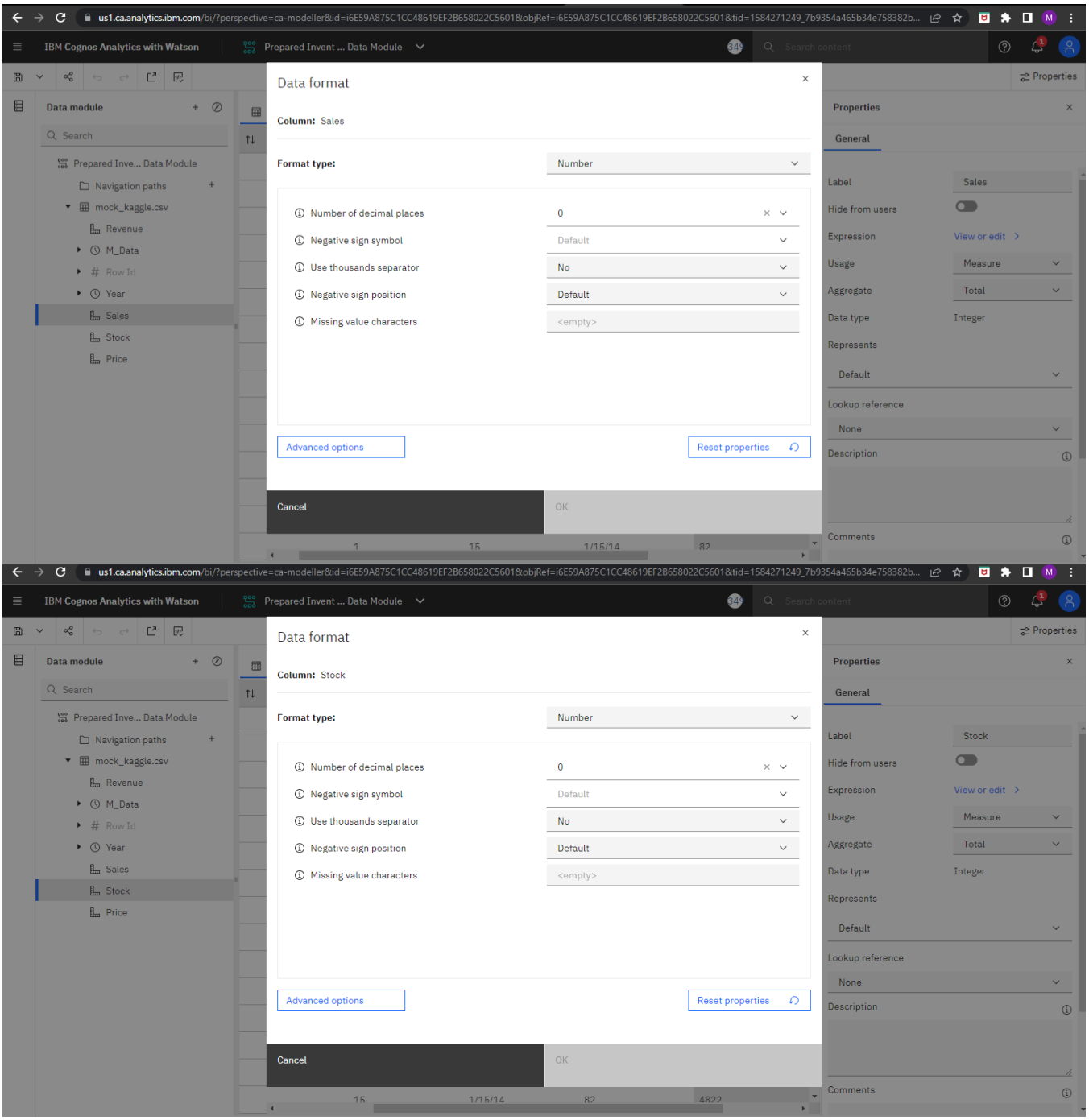
Sales
Stock
Price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Format type: Number
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Reset properties
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OK
Data module
Search
Prepared Inve... Data Module
Navigation paths
mock_kaggle.csv
Revenue
M_Data
Row Id
Year
Sales
Stock
Price
Properties
General
Label Sales
Hide from users
Expression View or edit
Usage Measure
Aggregate Total
Data type Integer
Represents Default
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Description
Comments
Data format
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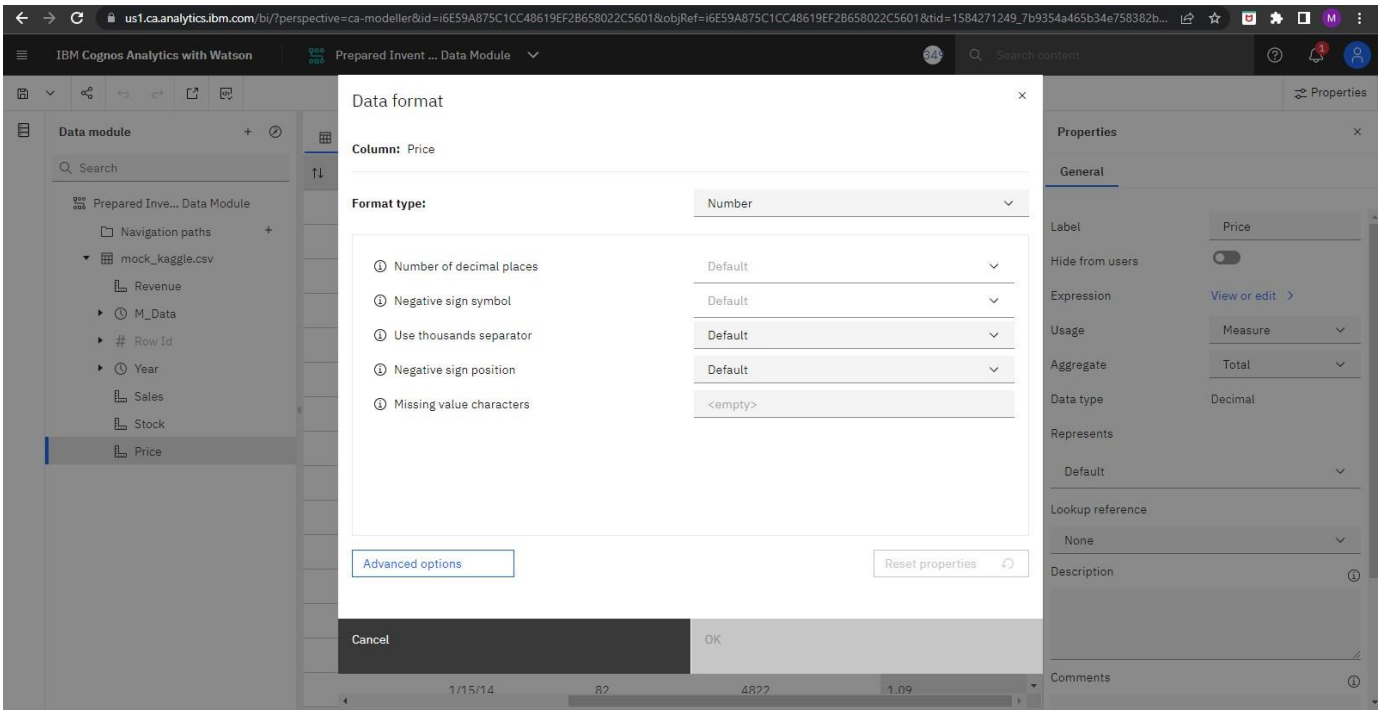
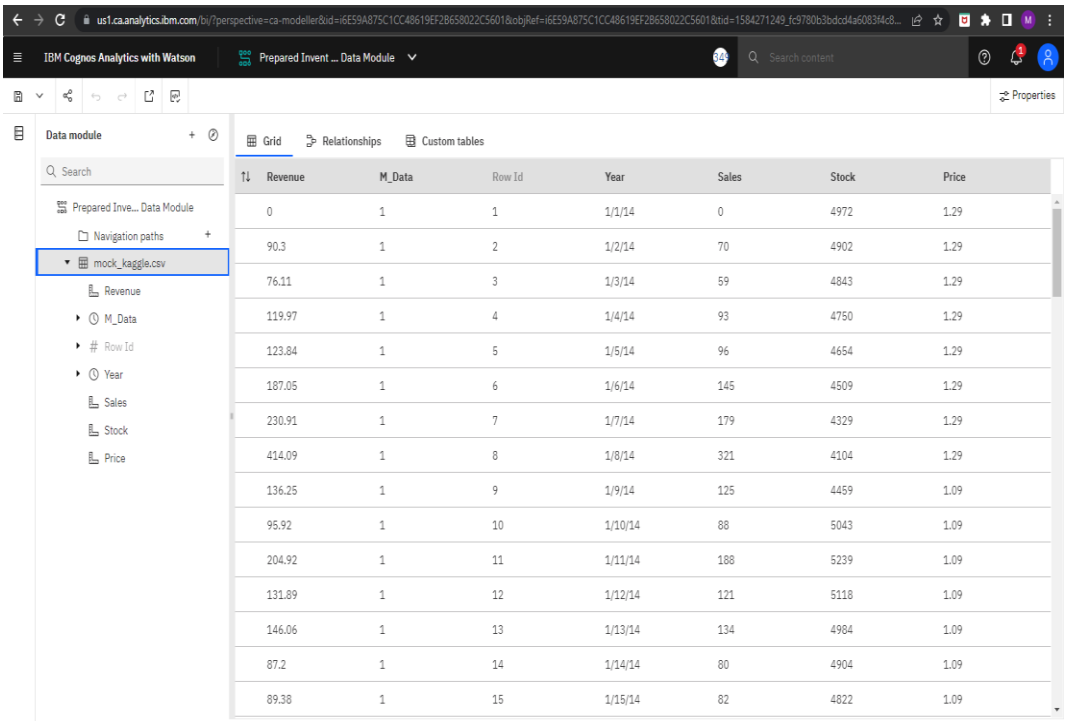
Label Stock





Prepared data link:

https://us1.ca.analytics.ibm.com/bi/?perspective=ca-modeller&pathRef=.my_folders%2FPrepared%2BInventory%2BData%2BModule

7.2 DELIVERY OF SPRINT 2

Project Development Phase:

Sprint-1:

- ➢ Data Collection
- ➢ Data Preparation

Sprint-2:

- ➢ Data Exploration

Sprint-3:

- ➢ Dashboard Creation

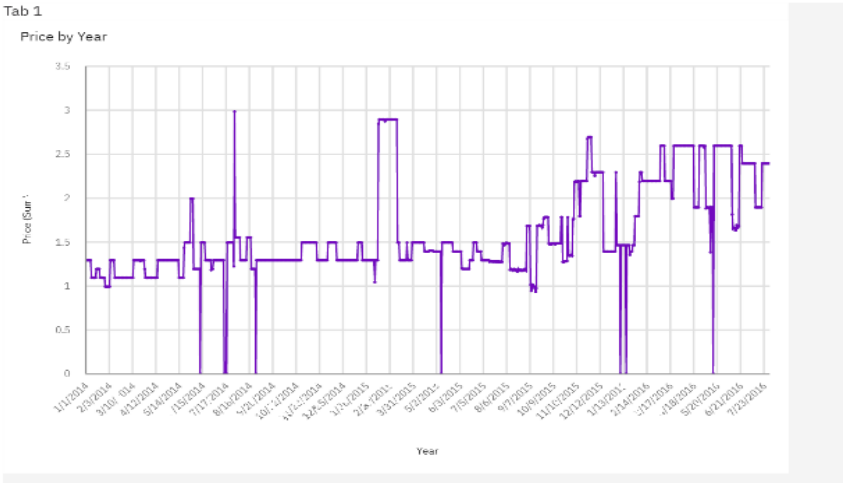
Sprint-4:

- ➢ Report Creation
- ➢ Story Creation

11/5/22, 7:46 PM

Year Wise Price Using Line Graph

Tab 1



11/5/22, 7:47 PM

Year Wise Stock Using Line Graph

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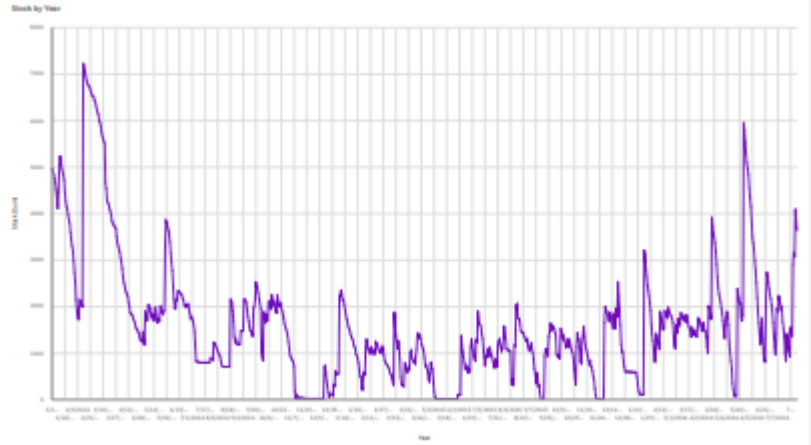


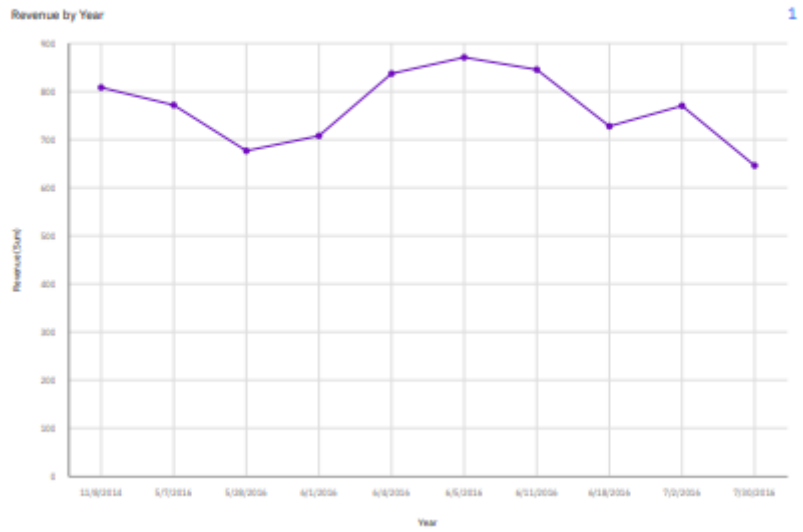
11/5/22, 7:46 PM

Top10 Sales By Year Using Line Graph

Tab 1

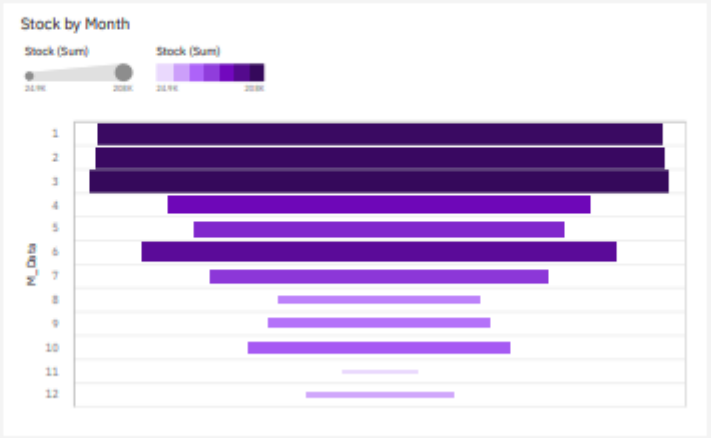
11/5/22, 9:36 PM Top10 Revenue by Year Using Line Graph

Tab 1



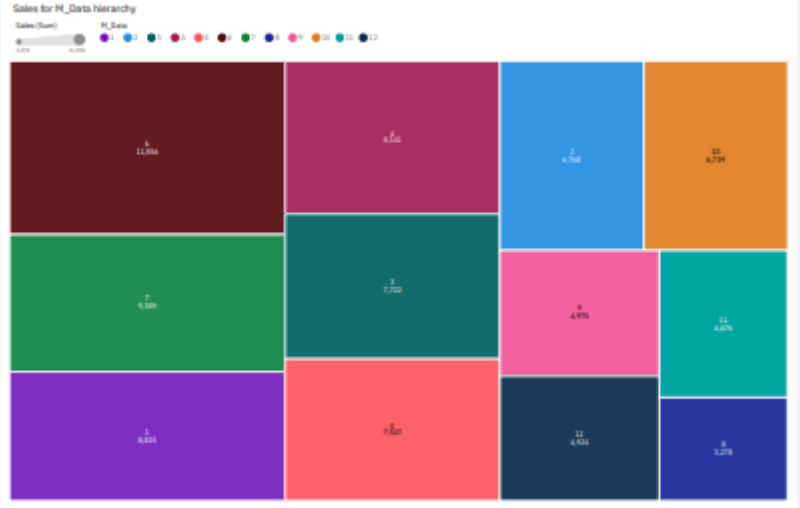
11/5/22, 9:56 PM Monthly Stock Using Heat Map

Tab 1



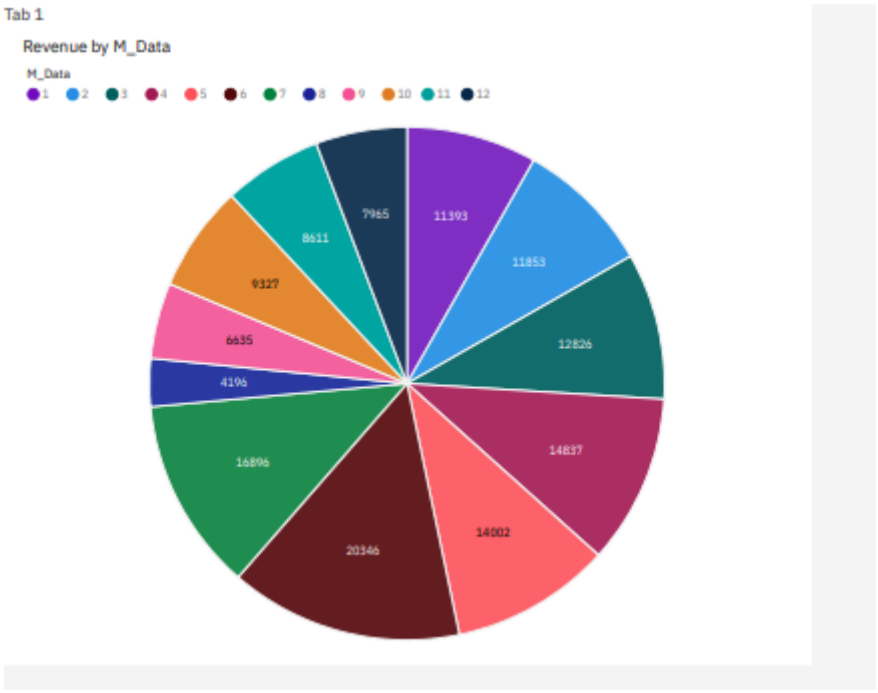
11/5/22, 7:39 PM Monthly Sales Using Tree Map

Tab 1



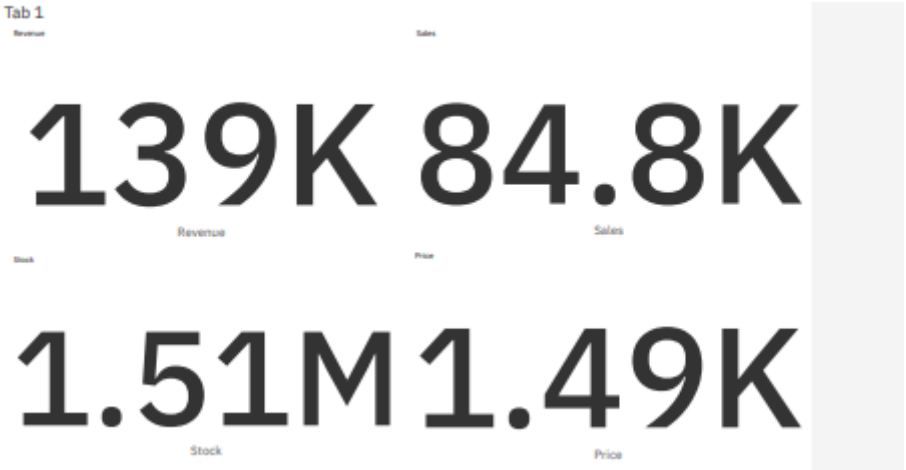
11/5/22, 7:31 PM Monthly Revenue By Pie Chart

Tab 1

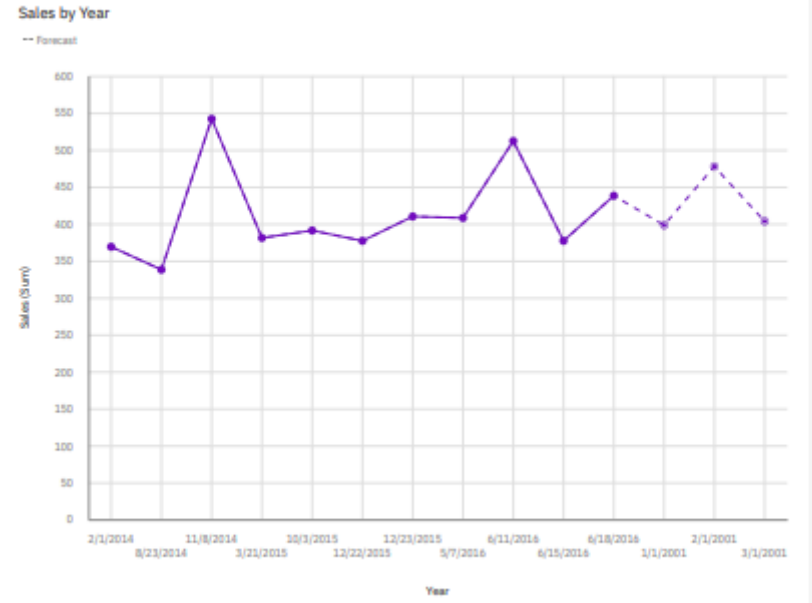


11/5/22, 7:44 PM Summary Cards Of Total Revenue,Sales,Stock,Price

Tab 1



Tab 1


Sales by Year
Forecast
600
550
500
450
400
350
300
250
200
150
100
50
0
Sales (Sum)
2/1/2014
8/23/2014
11/8/2014
3/21/2015
10/3/2015
12/22/2015
12/23/2015
5/7/2016
6/11/2016
6/15/2016
6/18/2016
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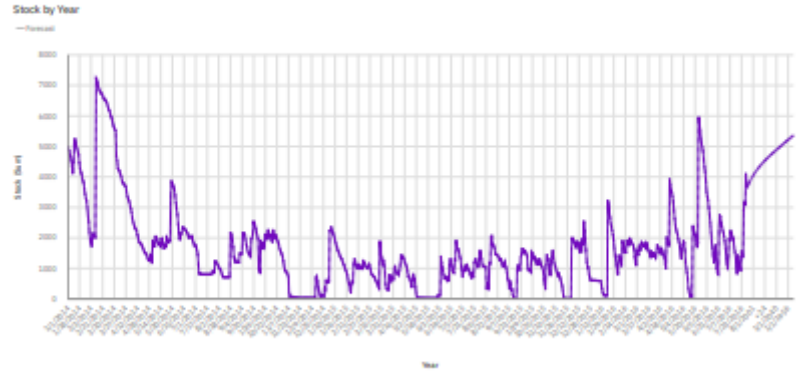
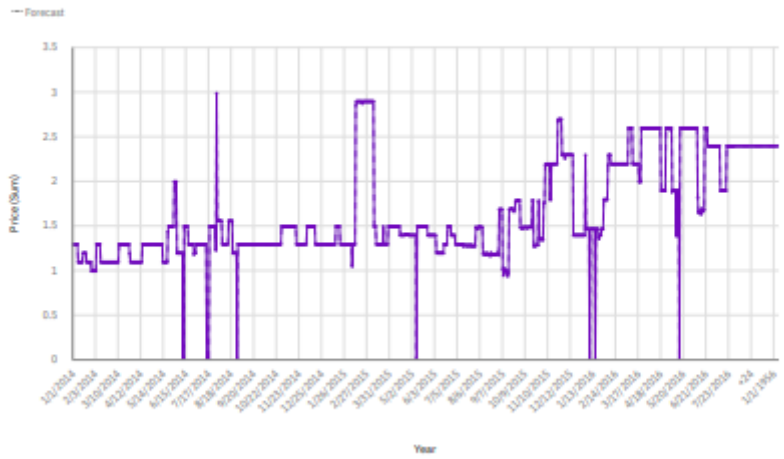
2/1/2001
3/1/2001
Year

Tab 2


Stock by Year
Forecast
Year

Tab 3

Price by Year



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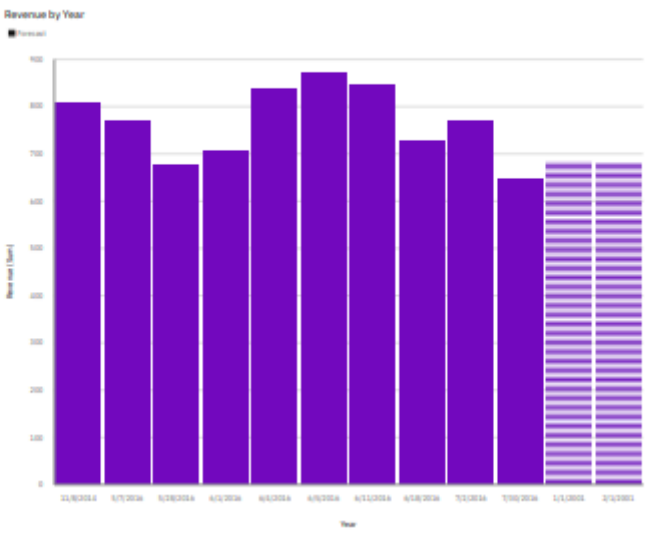


7.3 DELIVERY OF SPRINT 3

Project Development Phase:

Sprint-1:

- Data Collection
- Data Preparation

Sprint-2:

- Data Exploration

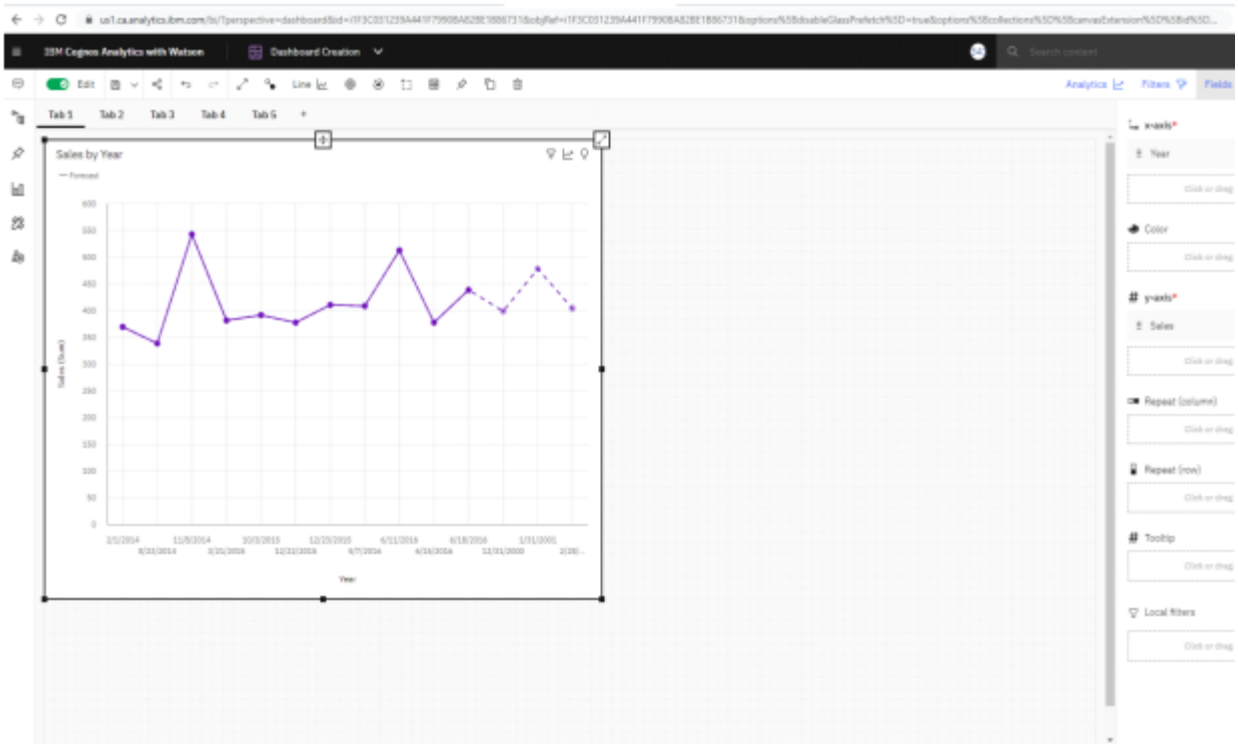
Sprint-3:

- Dashboard Creation

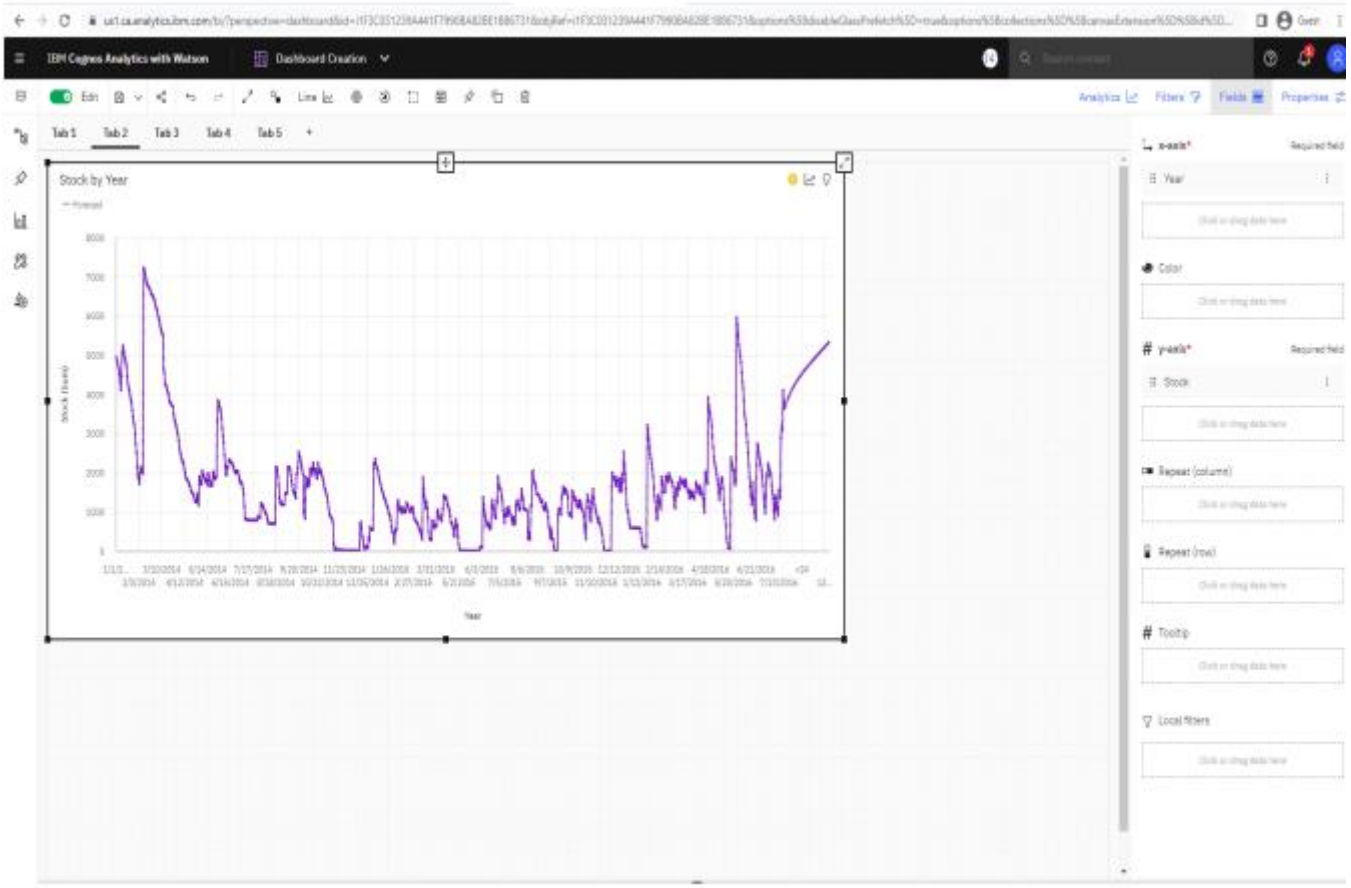
Sprint-4:

- Report Creation
- Story Creation

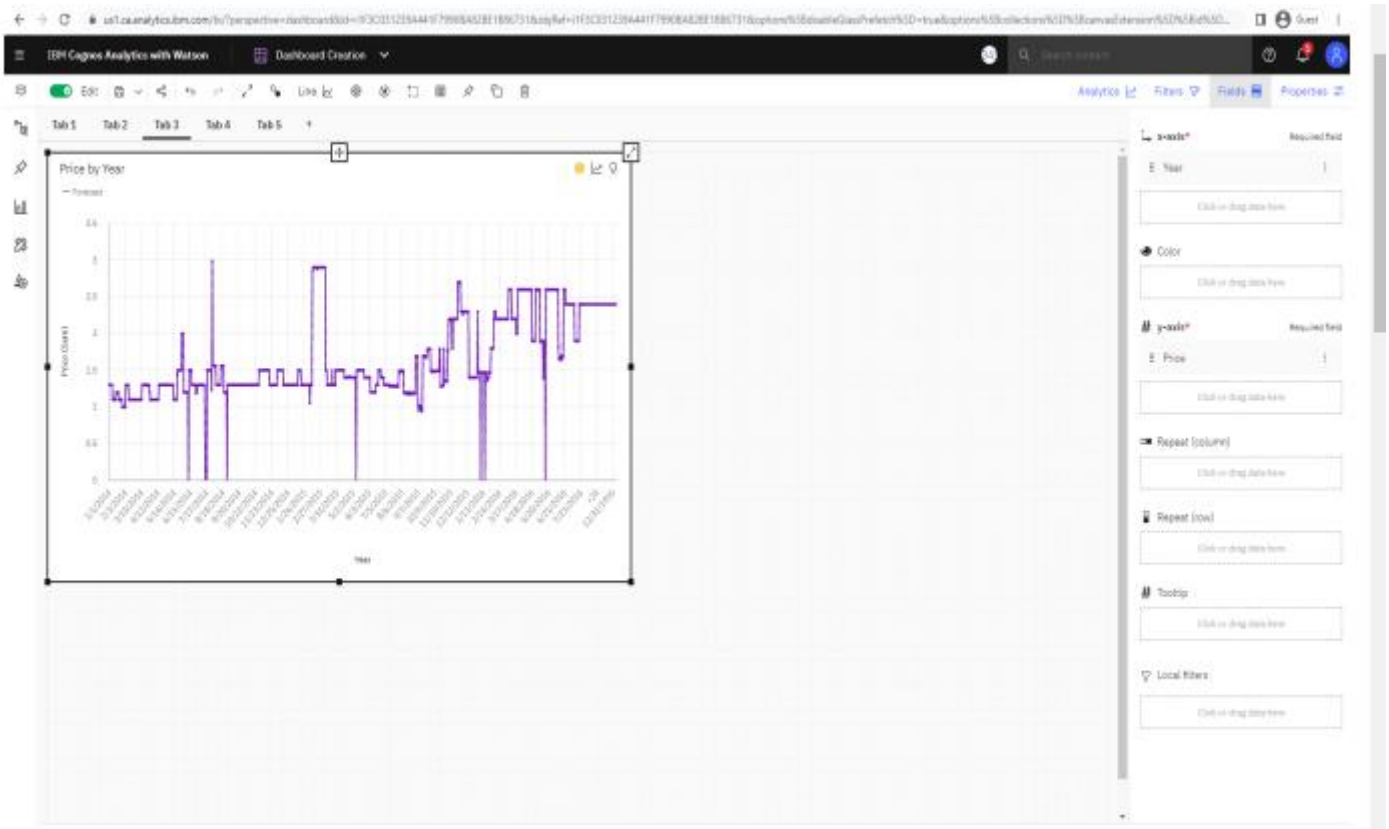
• Sales by Year Line Chart



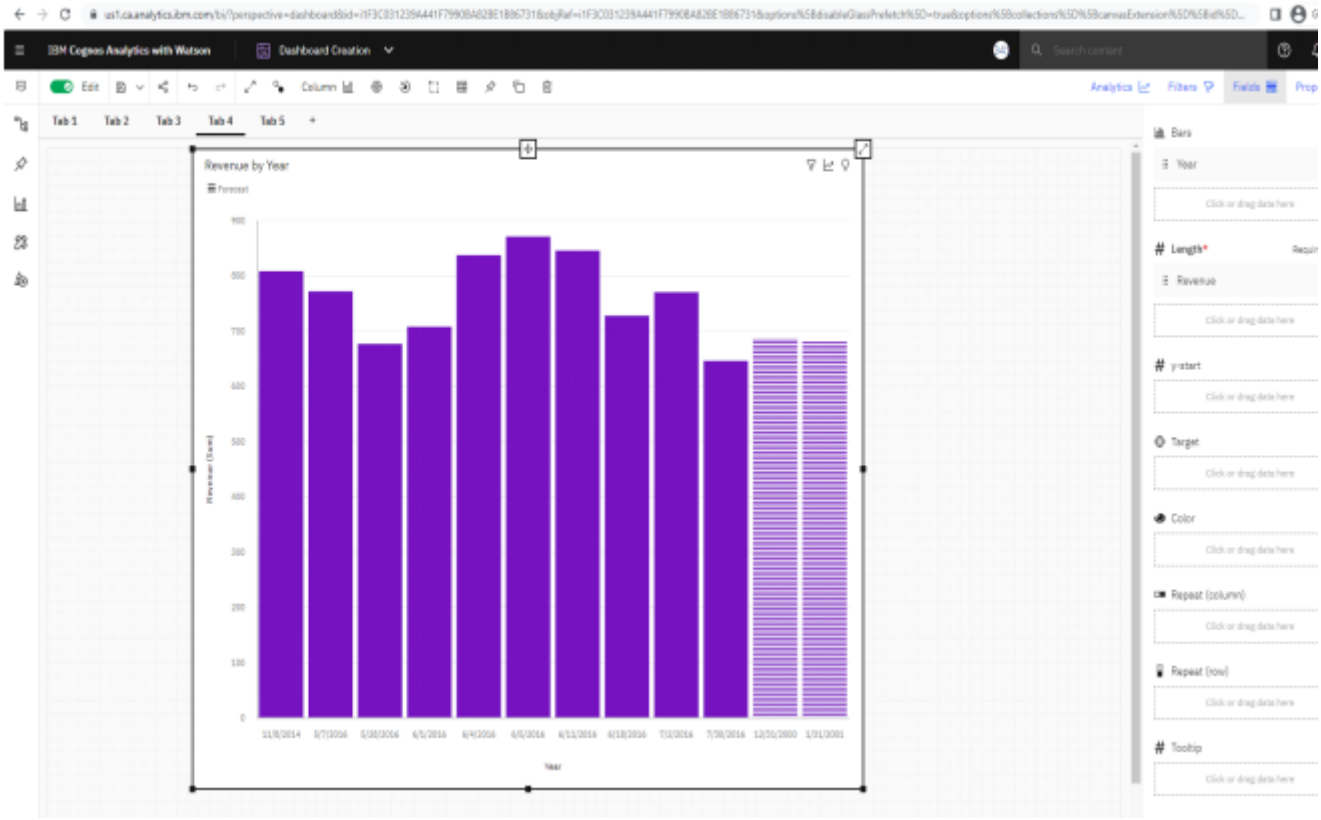
• Stock by Year a Line Visual



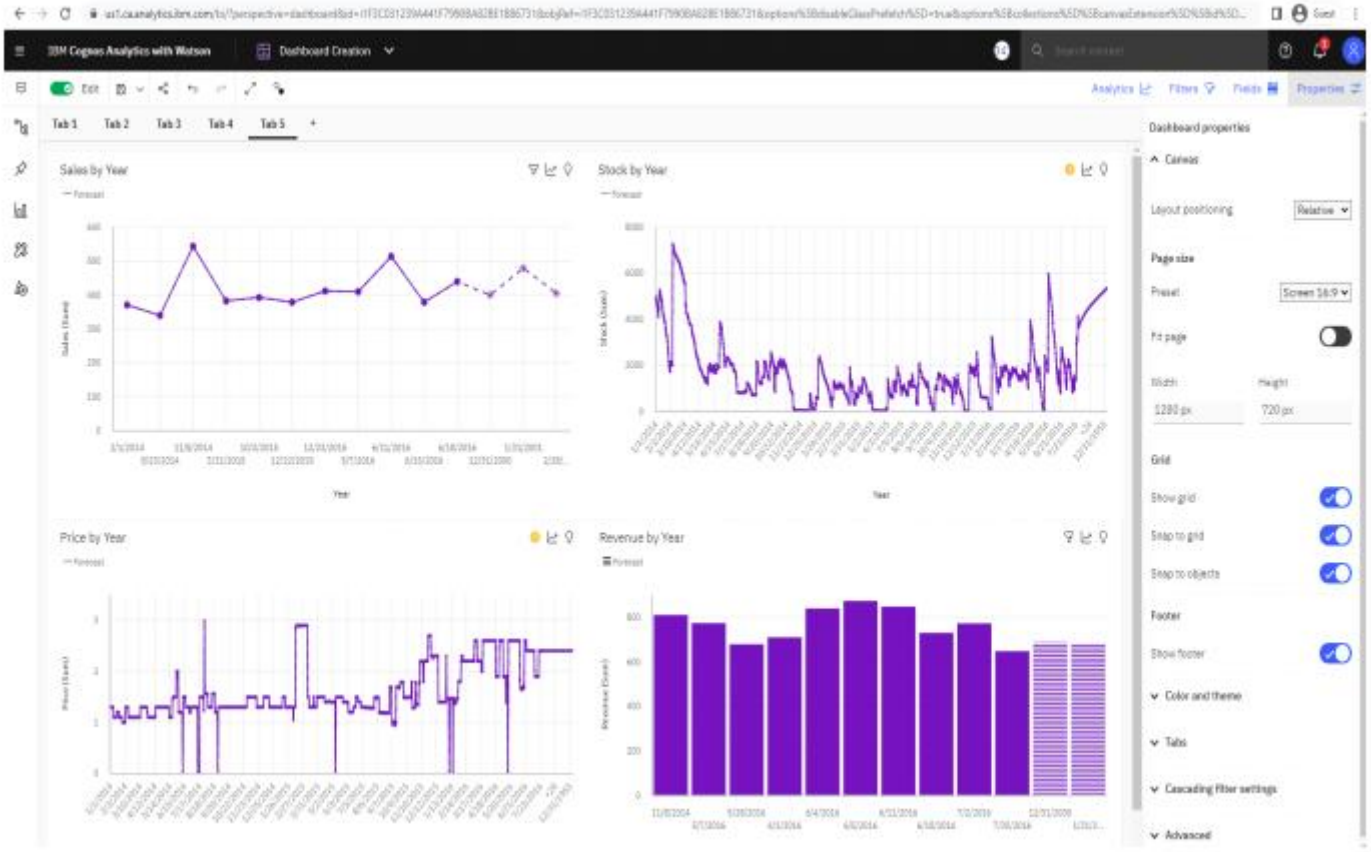
• Price by Year Line visual



• Revenue by Year Column Forecast visual



• Dashboard creation



7.4 DELIVERY OF SPRINT 4

Project Development Phase:

Sprint-1:

- ➢ Data Collection
- ➢ Data Preparation

Sprint-2:

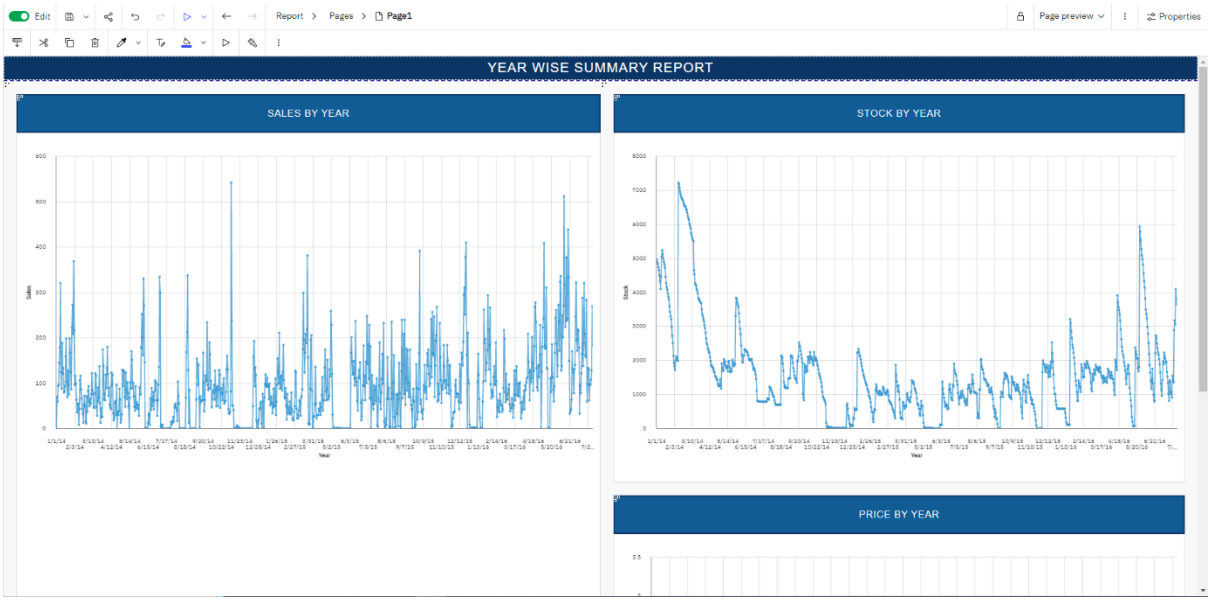
- ➢ Data Exploration

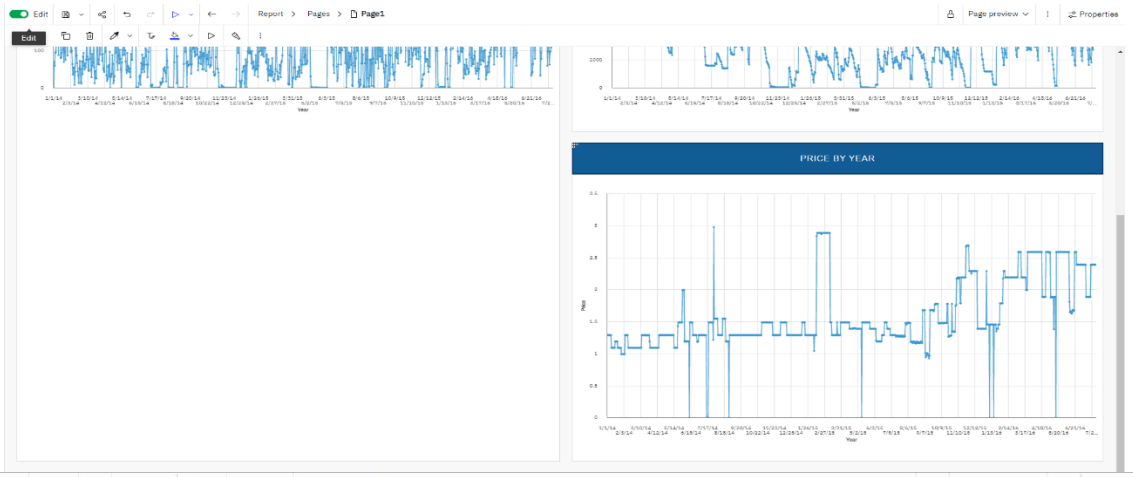
Sprint-3:

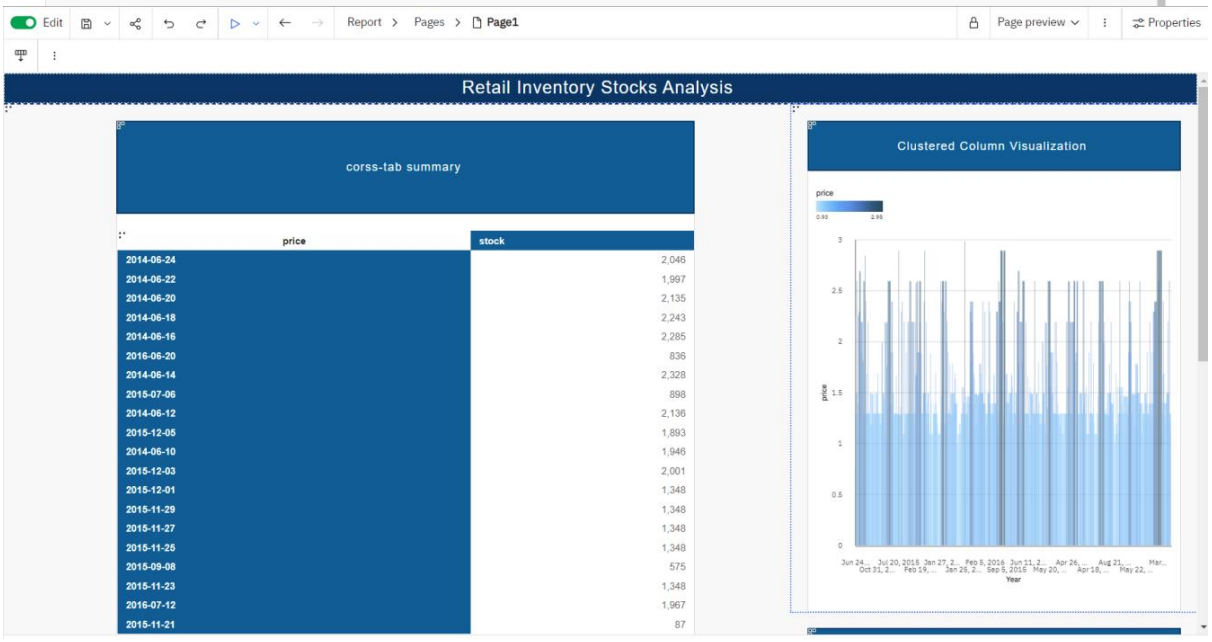
- ➢ Dashboard Creation

Sprint-4:

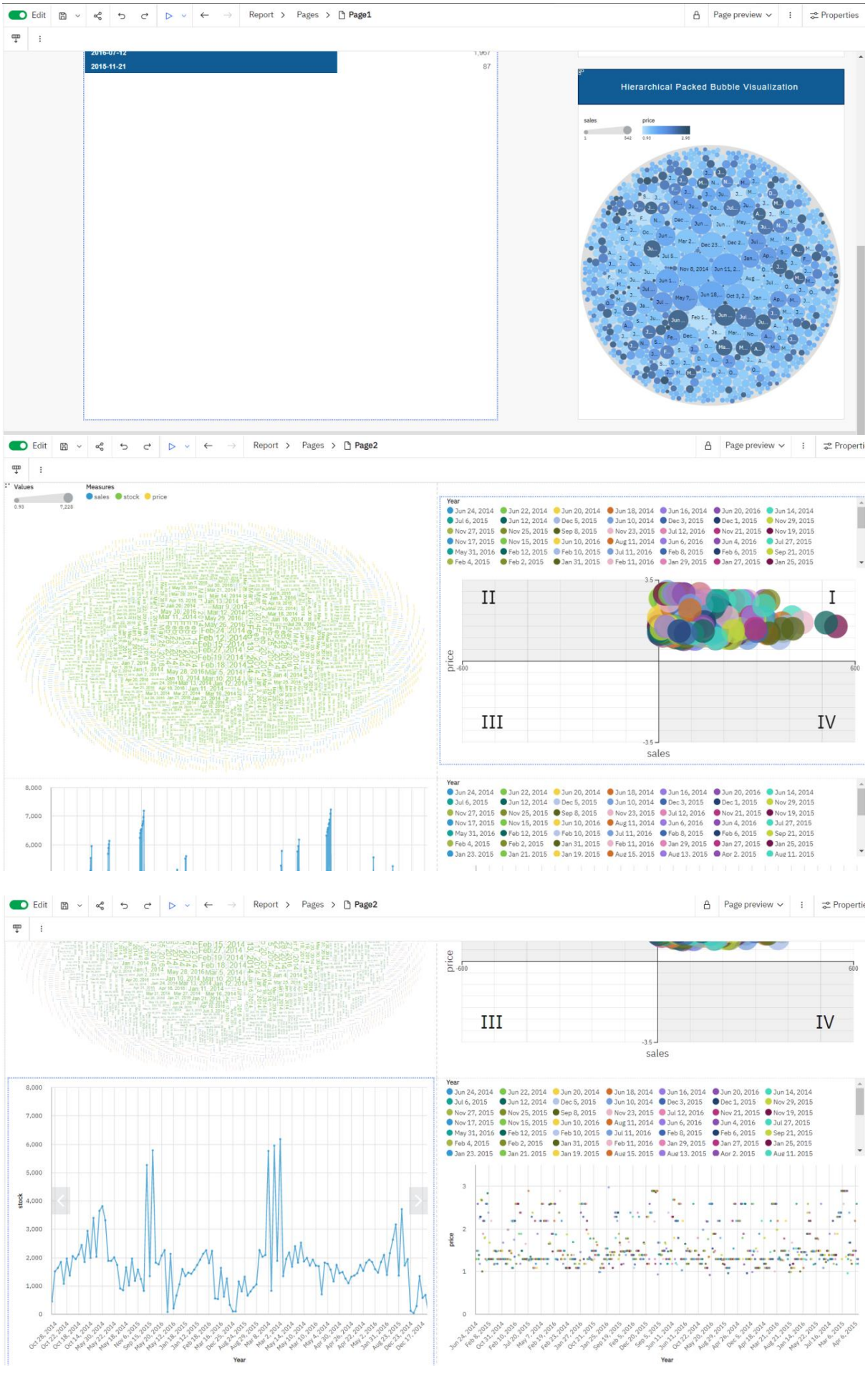
- ➢ Report Creation
- ➢ Story Creation







price	stock
2014-06-24	2,046
2014-06-22	1,997
2014-06-20	2,135
2014-06-18	2,243
2014-06-16	2,285
2016-06-20	836
2014-06-14	2,328
2015-07-06	898
2014-06-12	2,136
2015-12-05	1,893
2014-06-10	1,946
2015-12-03	2,001
2015-12-01	1,348
2015-11-29	1,348
2015-11-27	1,348
2015-11-25	1,348
2015-09-08	575
2015-11-23	1,348
2016-07-12	1,967
2015-11-21	87


Edit
Report > Pages > Page1
Page preview
Properties
2015-11-21
87
Hierarchical Packed Bubble Visualization
sales
price
Edit
Report > Pages > Page2
Page preview
Values
Measures
sales
stock
price
Year
II
I
III
IV
price
sales
8,000
7,000
6,000
Edit
Report > Pages > Page2
Page preview
III
IV
price
sales
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
stock
Year
price

8. CONCLUSION

The retail shop managers must develop a cutting-edge method of managing the inventory by putting in place electronic systems to look after the company's resources if they want the program to succeed. By doing this, it is ensured that they can be identified and that accurate data are constantly accessible for use when necessary. Additionally, the retail management system is essential to ensure that the corporation manages its supply with responsibility. Saving time is a benefit. Due to their considerable economic impact, retail businesses have grown to be quite important in many nations. As a result, it is crucial to examine their KPIs as well as the various tools, processes, and systems they employ for inventory management and optimization. The primary trends in inventory management within businesses were identified from the aforementioned factors.

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