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

HINDUSTHAN COLLEGE OF ENGINEERING AND TECHNOLOGY

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

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

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ABSTRACT

Inventory Management System is important to ensure quality control in businesses that handle transactions revolving around consumer goods. Without proper inventory control, a large retail store may run out of stock on an important item and it's also easy to lose its possible customer if they do not have sufficient stocks in the store.

A good Inventory Management System will alert the retailer when it is time to reorder. Inventory Management System is also an important means of automatically tracking the stocks of their product. For example, if a business orders ten pairs of socks for retail resale, but only receives nine pairs, this will be obvious upon inspecting the contents of the package, and error is not likely. On the other hand, say a wholesaler orders 100,000 pairs of socks and 10,000 are missing. Manually counting each pair of socks is likely to result in error. An automated Inventory Management System helps to minimize the risk of error. In retail stores, an Inventory Management System also helps track theft of retail merchandise, providing valuable information about store profits and the need for theft-prevention systems. The product quantity is updated by the store operator every time a product is bought/received. This information is then tracked by a central computer system. The Inventory Management System can serve a variety of functions in this case. It can help in identifying the overstock and understock products prior. It also provides sales insights and stock reports in the form of graphs/ charts which will be useful for easier visualization.

INTRODUCTION

As a topic, analytics has found its way from being discussed at the sidelines 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.

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.

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.

OBJECTIVE

By the end of this Project, you will:

Know 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).

Primary objective:

1. Identifying Consumer Demands:

The first task that a retailer has to perform is to identify the consumer needs and wants. The retailer does not provide raw materials, but offers finished goods and services in a ready-to-use form that the consumers want. For this, from time-to-time, retailer gathers information about consumers' liking, disliking, tastes and preferences.

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:

The retailer creates time utility by keeping the store open and ready for sale according to consumers' convenience. The new trend in retailing to longer trade hours reflects the socio-cultural changes where over one in ten people work outside normal hours resulting in changing trading hours and panacea for small retailers against the cheaper prices of the super stores and other retail chains. By being available at a location that has easy access and convenient to shop, retailer creates place utility. Finally, when selected and bought by customers, retailers create ownership utility.

In short, retailers are not only the final link between the consumers and the manufacturers but a vital part of modern business world. In the absence of retailing, one can easily imaging how difficult and costly for a consumer to approach a manufacturer for various things every time he wants. Retailers do not sell things in small quantities but make their shopping convenient and less risky.

Retailers have floor staff to answer their queries regarding how to use effectively and safely, guide them what to buy according to individual preferences and budget and give demonstration or display products so that the consumers should have a feel of the merchandise before buying. The successful retailer focuses its activities on meeting these objectives through effective marketing.

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 to support 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

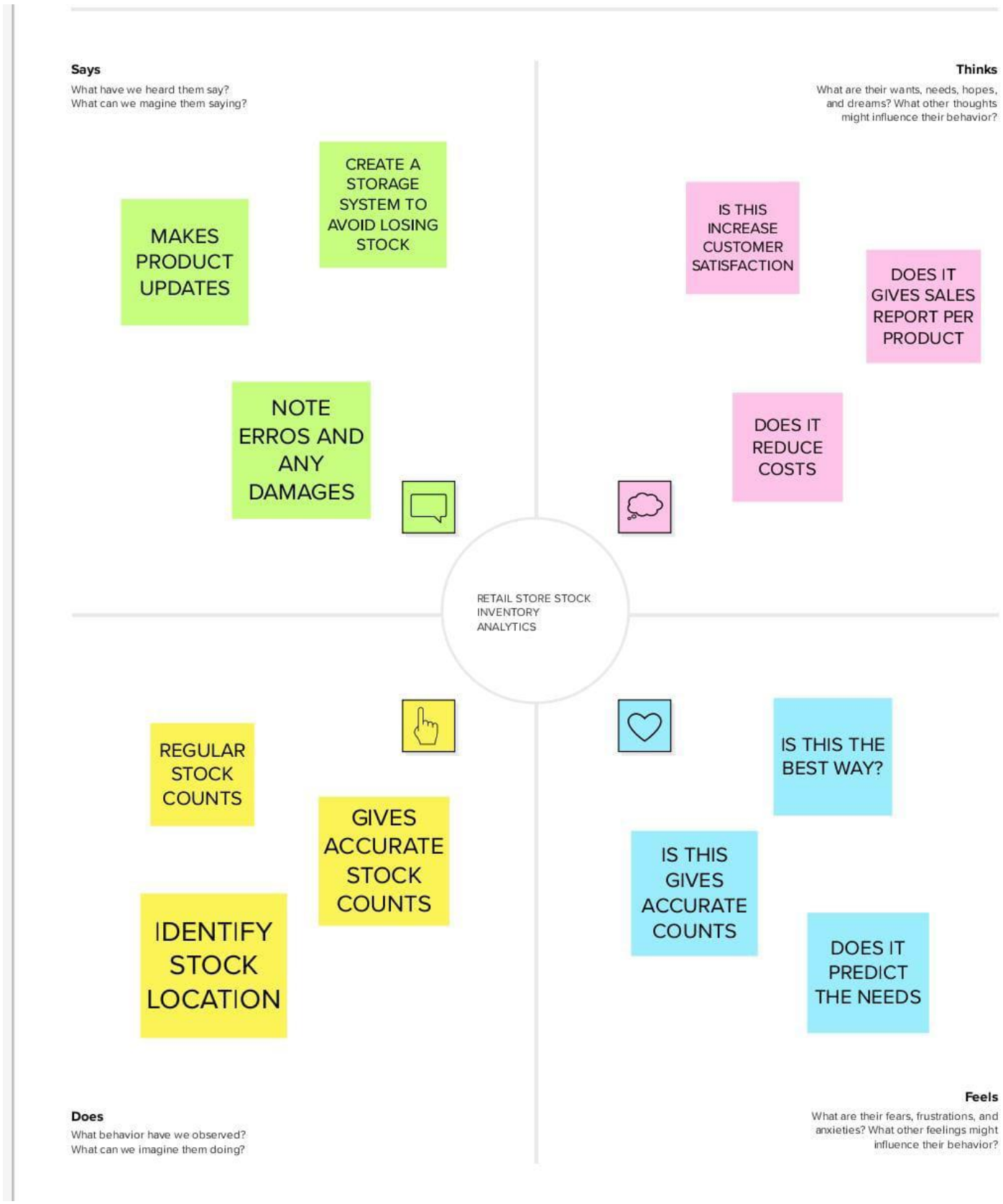
   https://www.researchgate.net/publication/329526158_Inventory_management_in_retail_industry_-_Application_of_big_data_analytics

   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 sector becomes 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 this scenario. The research identifies opportunities for incorporating BDA into traditional inventory management methods and boosting the applicability and feasibility of these models in the big-data environment.

2. Inventory management for retail companies: A literature review and current trends Author : 1.Cinthya VanessaMunoz, Jorge Andres Espinoza Aguirre, RodrigoArcentales-Carrion & Mario Pena

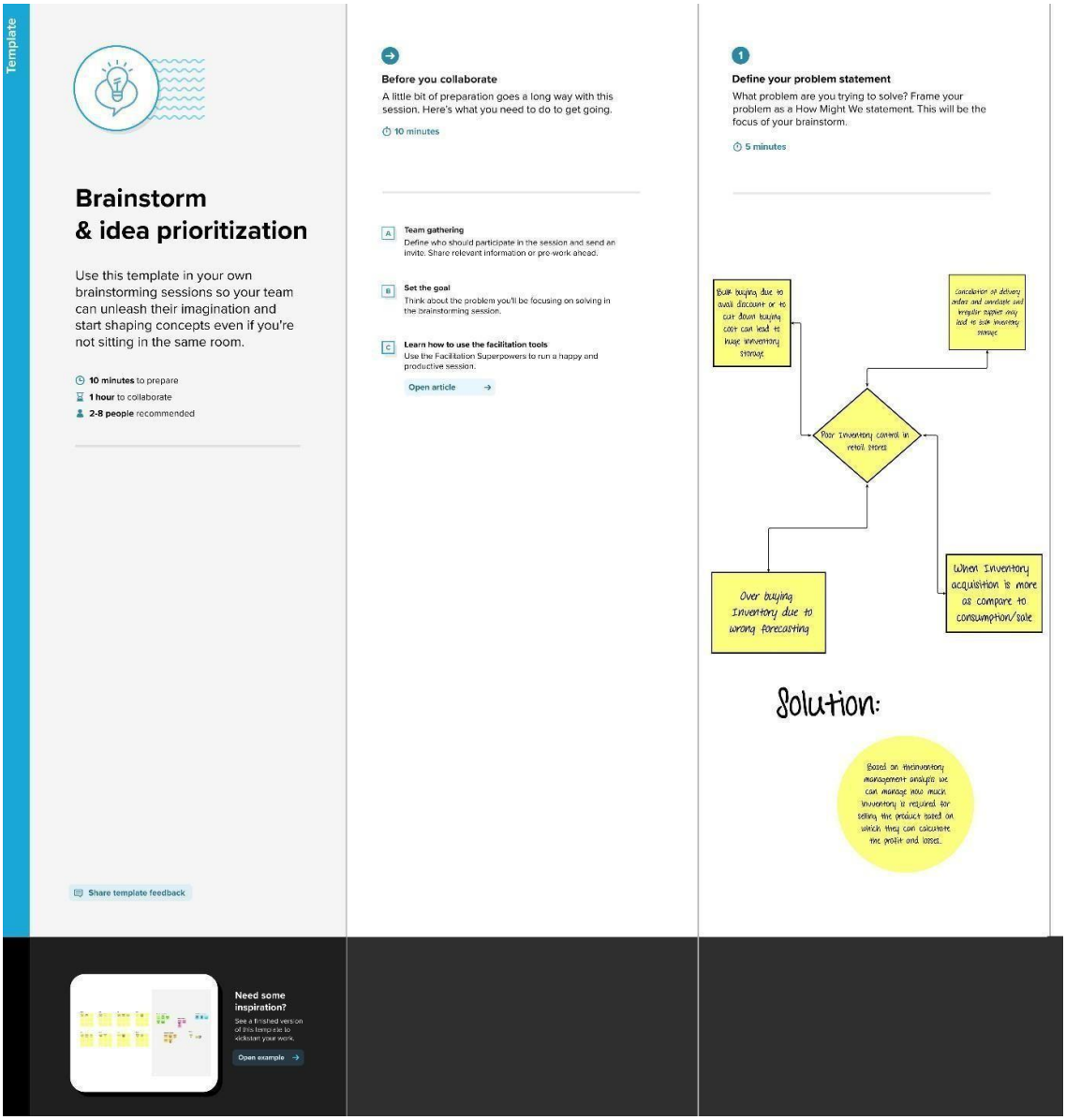
   https://www.researchgate.net/publication/352235223_Inventory_management_for_retail_companies_A_literature_review_and_current_trends To identify the primary trends and indicators of inventory management in Small and Mediumsized Enterprises, a systematic literature study was conducted (SMEs). The five-year study period between 2015 and 2019 mainly focuses on the retail industry. The main findings of this study include the top inventory control and management models, the Key Performance Indicators (KPIs) for managing them correctly, and the advantages and difficulties of selecting or implementing an effective system

3.2 EMPATHY MAP



3.3 IDEATION PHASE

Step 1:



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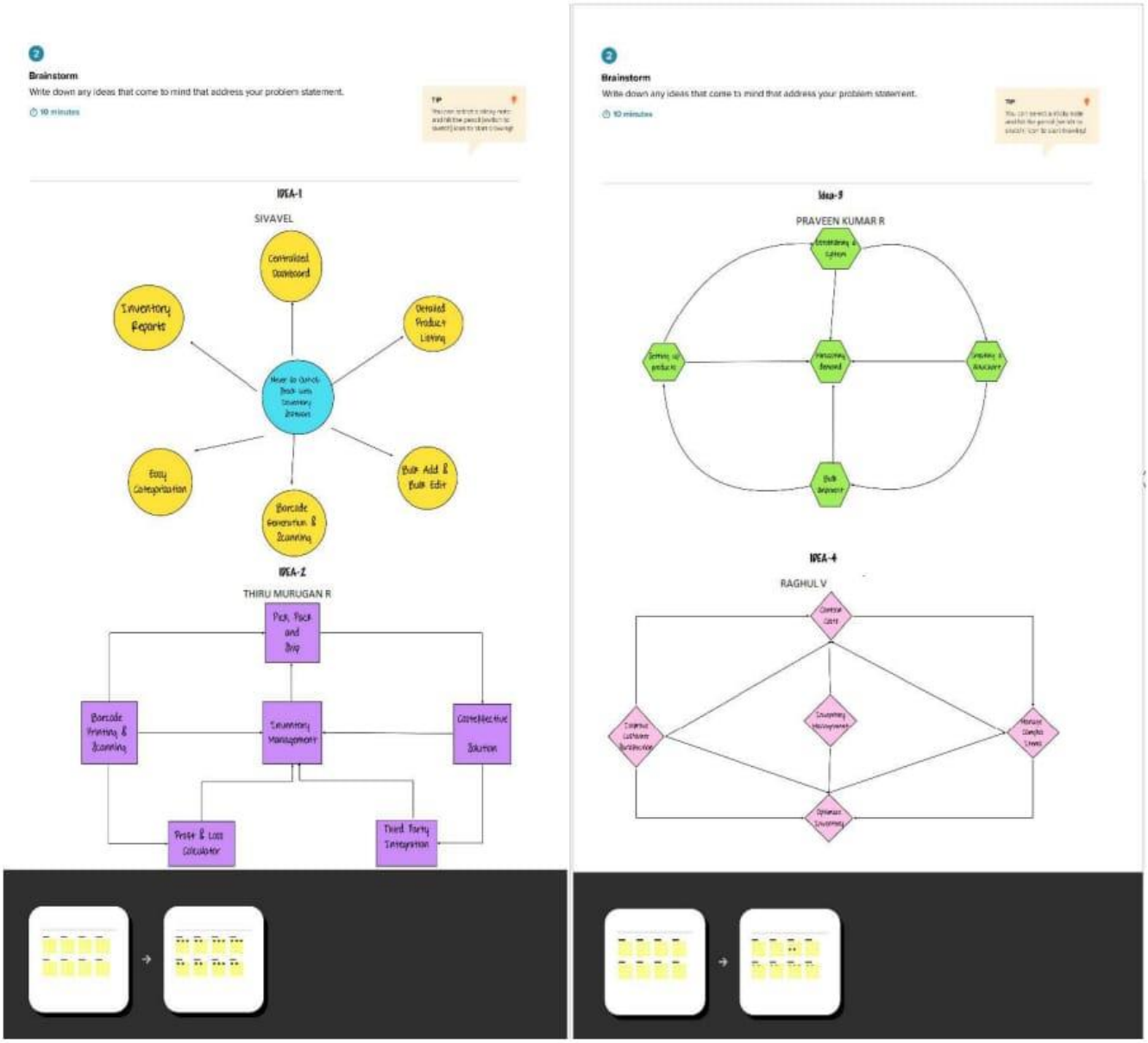
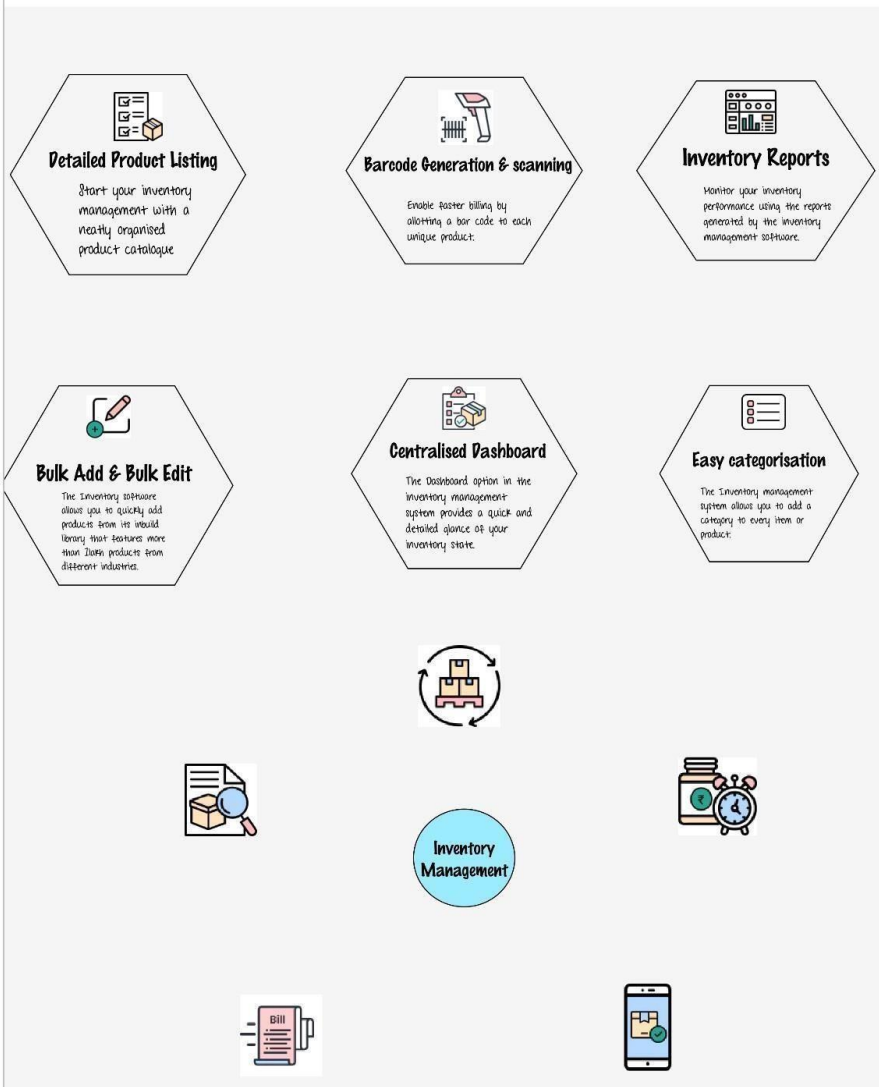

Brainstorm
Write down any ideas that come to mind that address your problem statement.
10 minutes
IDEA-1
SIVAVEL
Centralized Dashboard
Inventory Reports
Detailed Product Listing
Easy Categorization
Bulk Add & Bulk Edit
Barcode Generation & Scanning
IDEA-2
THIRU MURUGAN R
Pick, Pack and Ship
Barcode Printing & Scanning
Inventory Management
Comprehensive Solution
Profit & Loss Calculator
Third Party Integration
Brainstorm
Write down any ideas that come to mind that address your problem statement.
10 minutes
Idea-3
PRAVEEN KUMAR R
IDEA-4
RAGHUL V

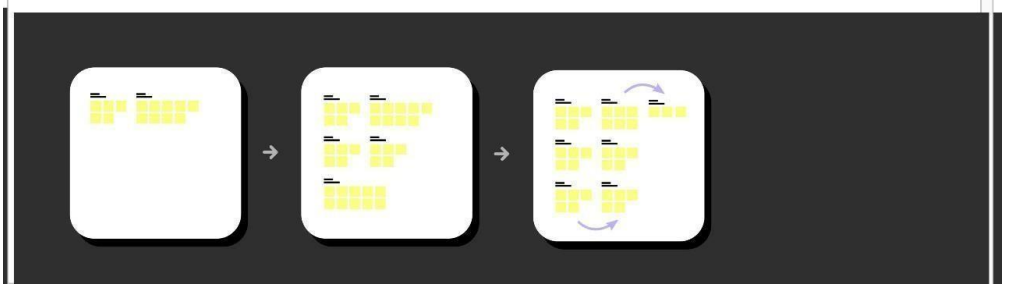
3

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





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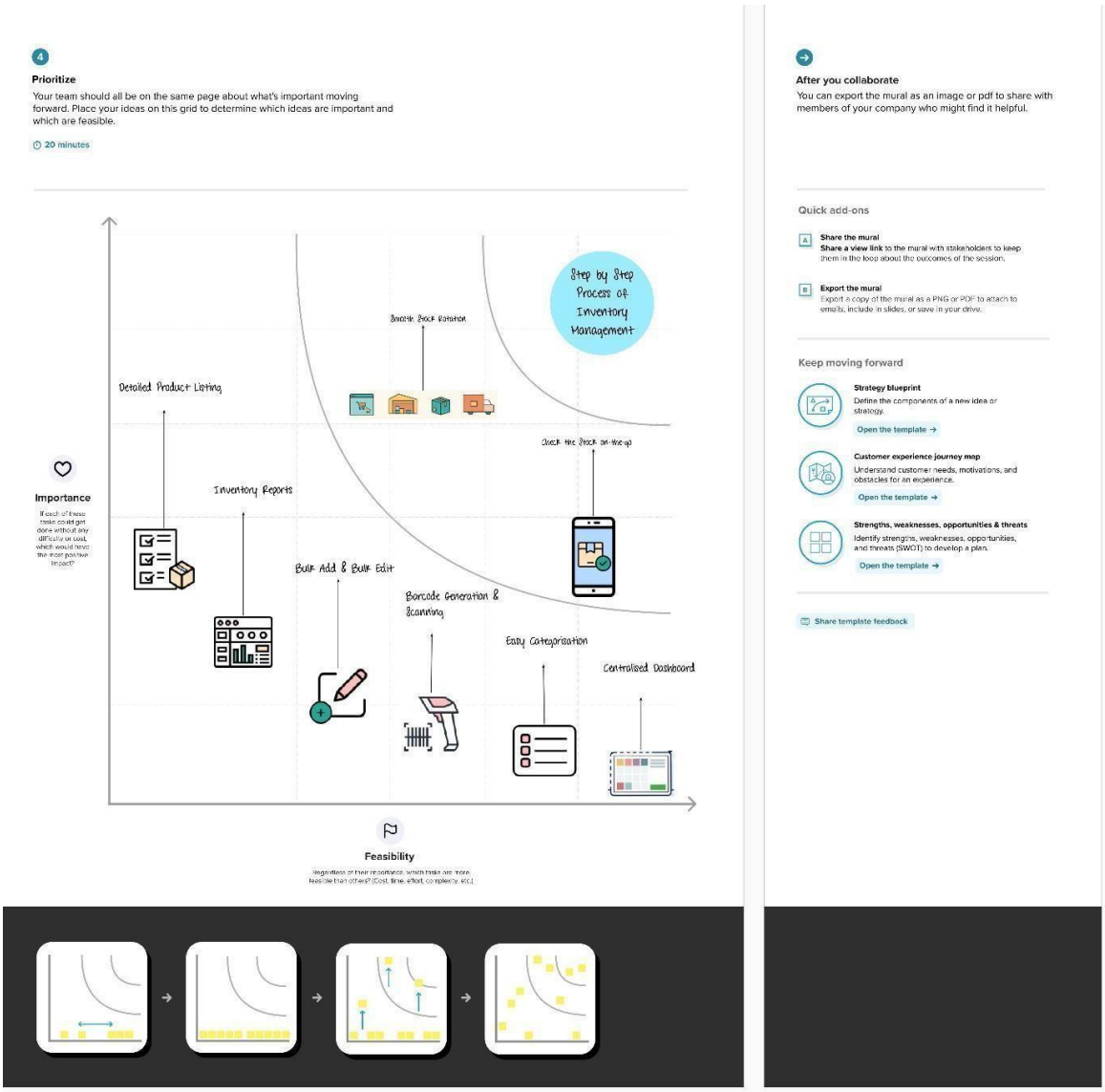

4
Prioritize
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.
20 minutes
Importance
Feasibility
Step by Step Process of Inventory Management
Detailed Product Listing
Inventory Reports
Barcode Stock Rotation
Bulk Add & Bulk Edit
Barcode Generation & Scanning
Easy Categorisation
Centralised Dashboard
Check the Stock on-the-go
After you collaborate
You can export the mural as an image or pdf to share with members of your company who might find it helpful.
Quick add-ons
Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.
Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.
Keep moving forward
Strategy blueprint
Define the components of a new idea or strategy.
Open the template →
Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →
Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →
Share template feedback

3.4 PROBLEM STATEMENT

IBM – Naalaiya Thiran

RETAIL STORE STOCK INVENTORY ANALYTICS

THIS PROJECTS AIMS TO BUILD AN ANALYTICAL DASHBOARD FOR SALES DATA USING IBM COGNOS

PROJECT DESCRIPTION

This 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.

Technical Architecture:

Skills Developed:

1. Exploratory Data Analysis
2. IBM Cloud

4.PROJECT DESIGN PHASE 1

4.1 PROPOSED SOLUTION

S .No	Parameter	Description
1.	Problem Statement	1.To predict the stock demand and give insight to retailers regarding the demand 2. To predict and visualize the season sales with help ofhistorical sales data for the products
2.	Solution description	1. As we know Inventory management deals with stock demand and supply which helps retailers to improve their business with more profit 2.. By understanding the dataset and identifying thepattern and relationship with the help of pythonlibraries like pandas, NumPy, TensorFlow, Keras,matplotlib
3.	Novelty / Uniqueness	Season Sales: We know that season sales occur during a particular month or period of the year and some products are brought in large quantities during that period. And some products are brought along with other products. For example, During the Pongal sale if a person buys rice he/she may also buy jaggery, ghee, or dry fruits. If we analyze those records we can and supplythem accordingly. As for leftover milk which has an expiry of one day we can convert the milk to other by-products like curd, ghee, butter, etc., and milk has a short lifetime for which we can fix competitive prices.
4.	Social Impact / Customer Satisfaction	Retailers will know the market trends and also what products are brought frequently together
5.	Business Model	1. This business model will increase the number of sales by the quantity of stock available because the stocks are stored in the warehouse depending upon the demand from the customers 2. This idea will increase the profit because we can sell the by-products of milk which increases the profit by multi folds than the raw product milk itself.
6.	Scalability of the Solution	1. This idea will predict the most selling product during season sales which can optimize overstocking and understocking 2. This model can be scaled from corner shop retailers to supermarket retailers

4.2 PROBLEM SOLUTION FIT

Project Design Phase-I - Solution Fit Template

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

1. Retail Store Owners
2. Stock Suppliers

6. CUSTOMER CONSTRAINTS CC

What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget no cash, network connection, available devices.

1. Overstocking
2. Understocking
3. Demand and Supply budget

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face the

1. Existing solution has more drawbacks like tracing the demand and supply of product is difficult
2. It is difficult to predict when a certain product will get rocket sales and when it will go down

Explore AS, differentiate

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

2. JOBS-TO-BE-DONE / PROBLEMS J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

1. Predicting the sales by understanding customer behaviour.
2. Managing the budget in terms of product which did not sale but there are more stocks available without moving.
3. To provide better supply chain management by understanding the demand and supply

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists?
What is the back story behind the need to do

1. Retail shop owners face difficulty in understanding customer behavior manually without help of technology.
2. And because of rapid growth in products available it has become difficult to trace the demand and supply for various products

7. BEHAVIOUR BE

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

1. They try the interface for overcoming the problem but existing models are complicated to use so they stop using it.
2. They can attend workshops to gain knowledge on inventory management.

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

Identify strong TR & EM

3. TRIGGERS TR

1. How to increase sales during seasonal festivals without any demand and supply problems.
2. Inspired by reading stock analysing and marketing strategies magazine.

4. EMOTIONS: BEFORE / AFTER EM

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

1. Frustrated, Stressed, Confused, Anxious
2. Empathy, Joy, Satisfied, Relaxed

10. YOUR SOLUTION SL

If you are working on an existing business, write down your current solution first.

1. Analysing the sales in the previous year can help us know the ups and downs sales of the product.
2. By analyzing the frequency pattern and the items bought together to manage the inventory of those products.
3. To have another solution to keep the stocks safe in case of emergency situations.

8. CHANNELS of BEHAVIOUR CH

1. Online:

Giving ads about how they provide service and giving ads like they have all products in stock when asked they'd never say that it is not available.

2. Offline:

By interacting personally with the surrounding customer the retail shop owner has and the regular customer he/she has.

Identify strong TR & EM

4.3 SOLUTION ARCHITECTURE

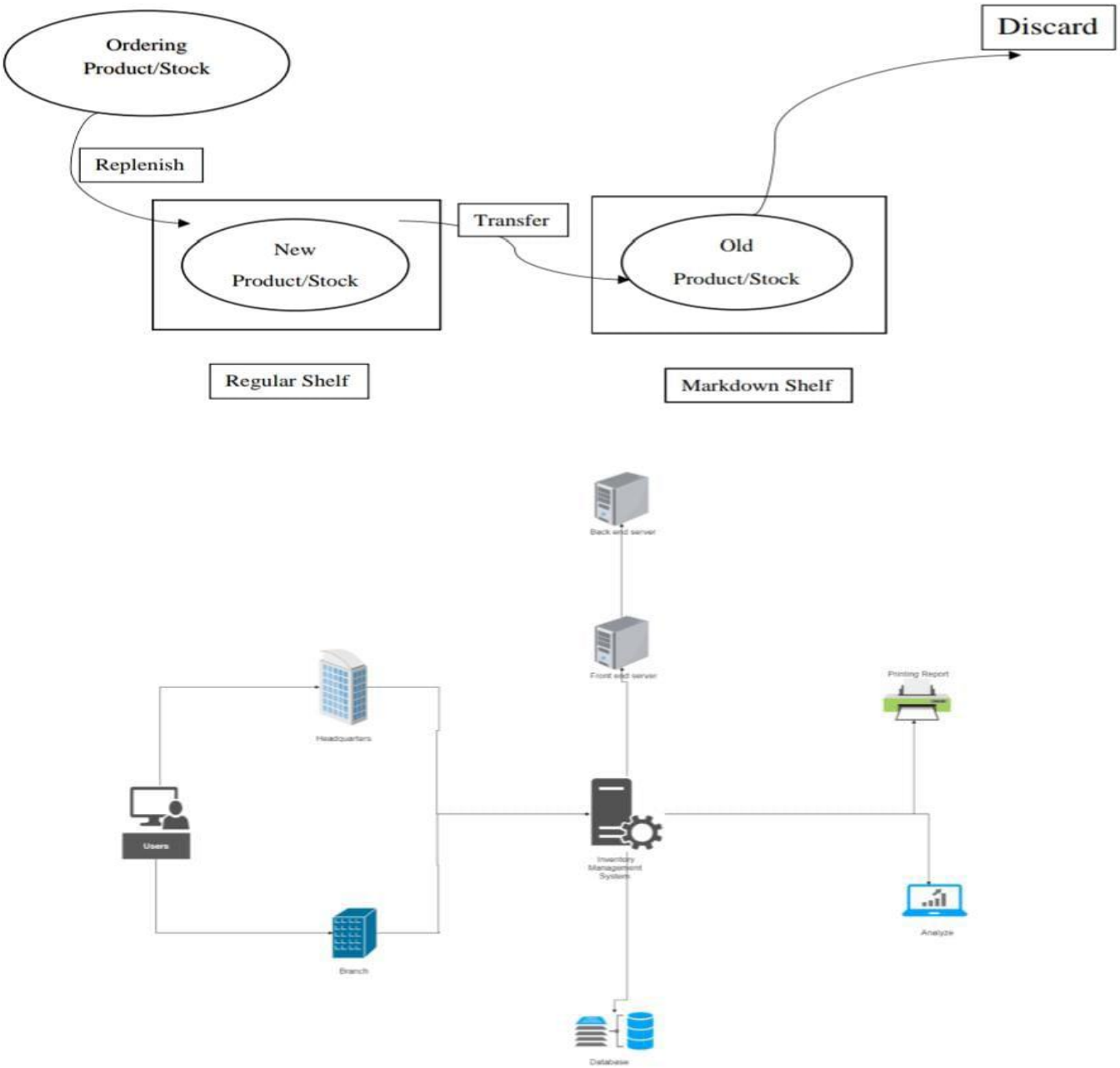


Figure 1: Architecture and data flow of the voice patient diary sample application

5.PROJECT DESIGN PHASE 2

5.1 CUSTOMER 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 Linked INRegistration through Website Registration through G-mail
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:

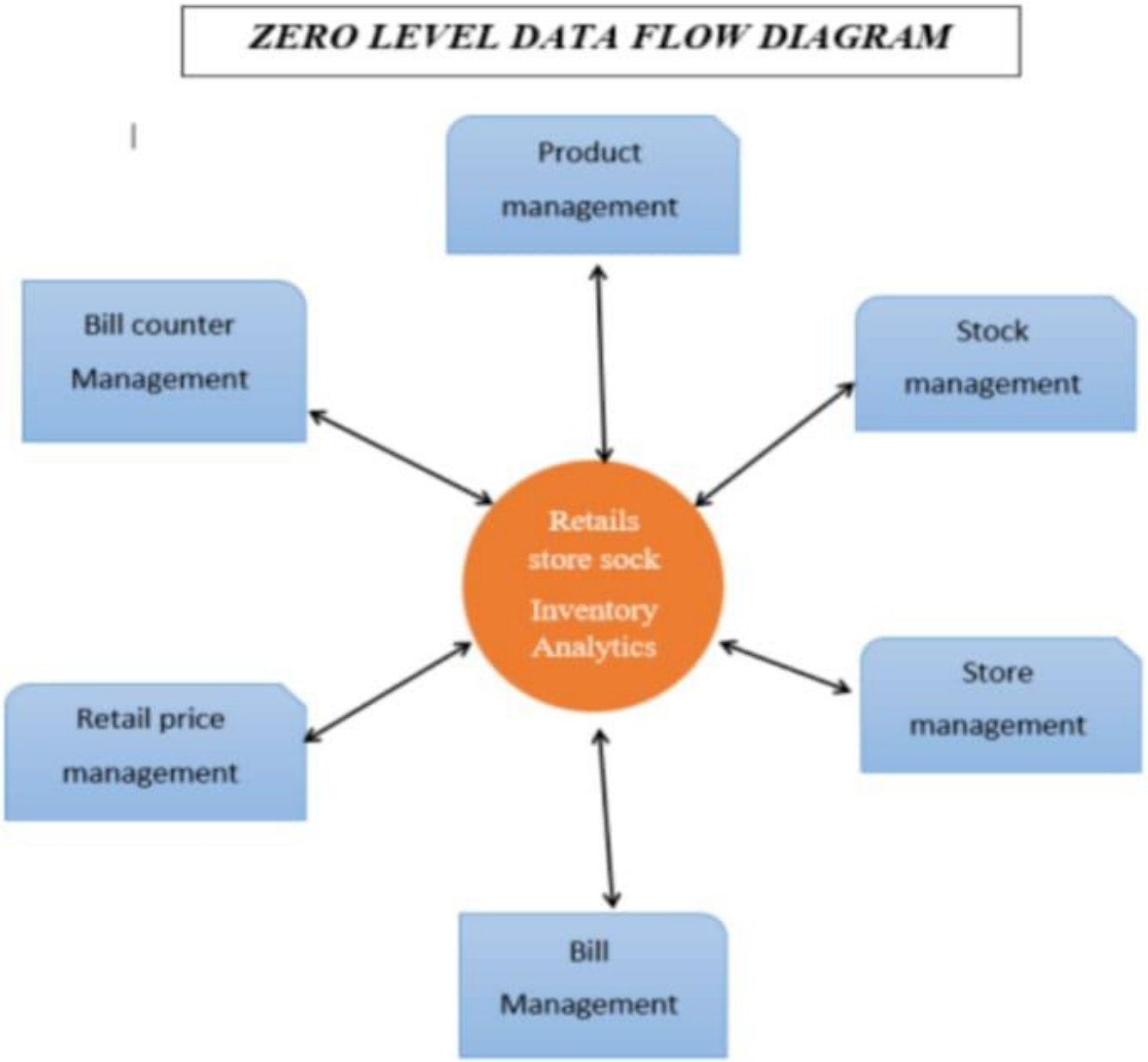
Following are the non-functional requirements of the proposed solution.

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. This model can be supported on both mobile and web browser.
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 valuation Prevent order delays Reduce dead stock
NFR-4	**Performance**	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.

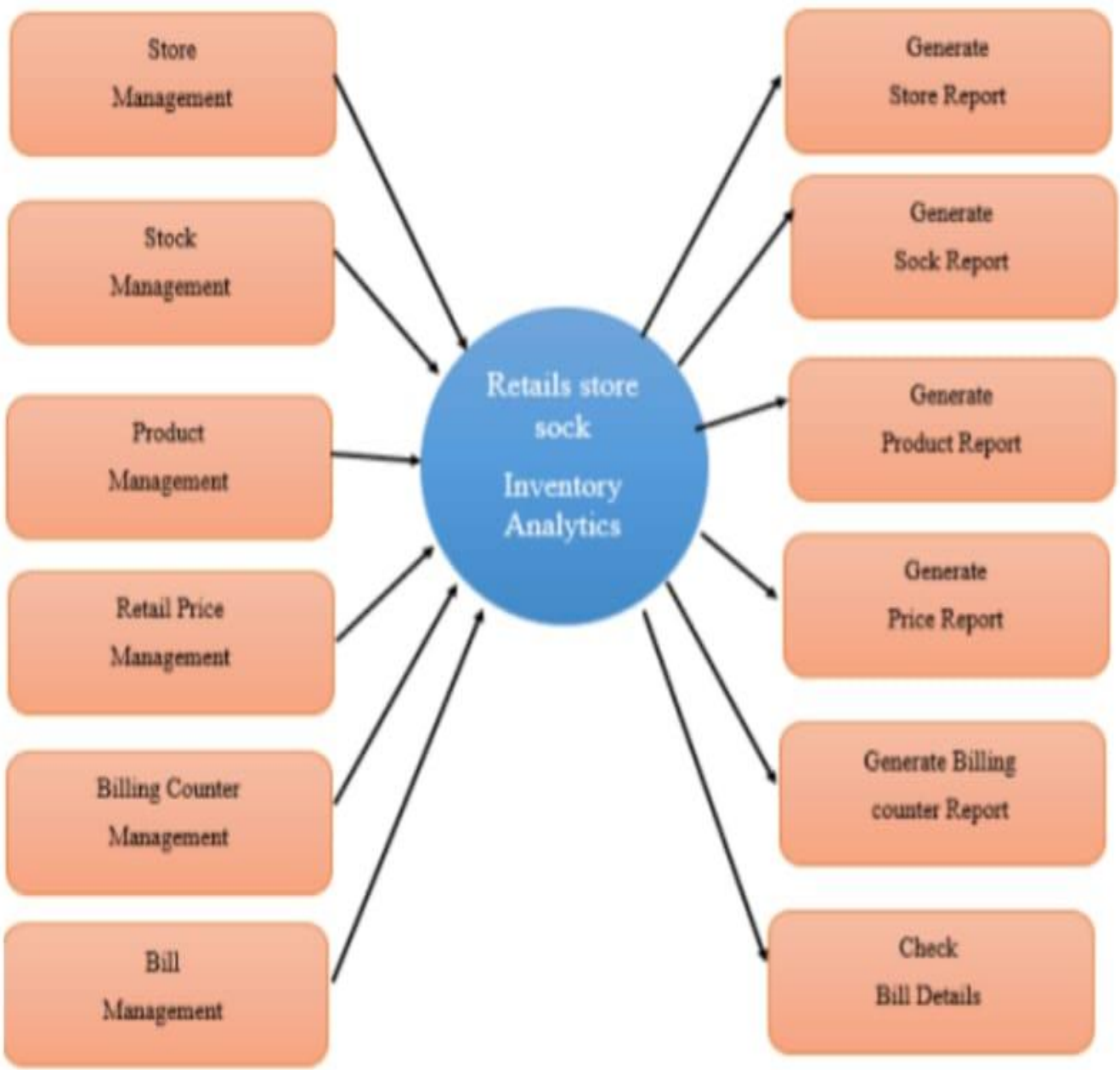
5.3 DATA FLOW DIAGRAM

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.



FIRST LEVEL DATA FLOW DIAGRAM



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:

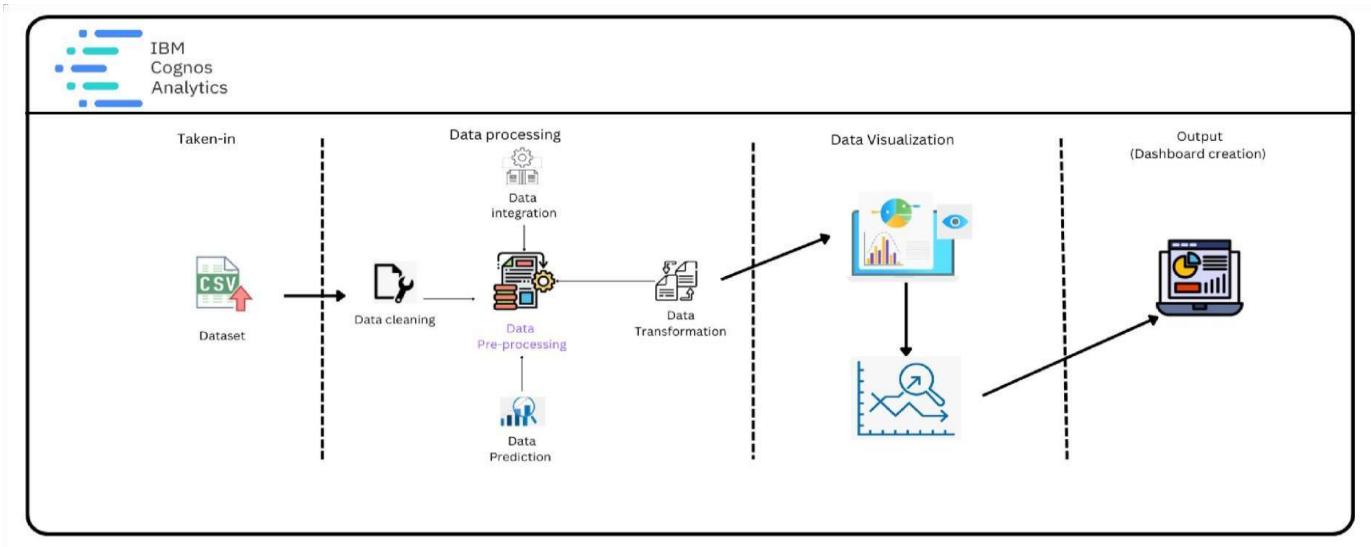


Table-1 : Components & Technologies:

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	Activities
Milestone - I	• Gathering the data • Understanding the dataset. • Loading the dataset onto IBM Cognos Analytics.
Milestone - II	• Preparing the data. • Exploring the data. • Visualizing the data.
Milestone - III	• Creating an interactive Dashboard. • Managing the Stock Inventory.
Milestone - IV	• Stock Analysis Prediction on the most sold period or least sold period. • Ensuring clean and detailed visualization over a specific period of time. • Monitoring Stock prices using visualization charts.
Milestone - V	• Maintaining a threshold to report the system on understock or overstock. • Creating story

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	Data Collection	USN-1	The dataset is collected and the understanding of dataset is done to present the analytics to the user	2	High	Sivavel R Thiru murugan R Praveen kumar R Raghul V Prem kumar R
Sprint-1	Data Preparation	USN-2	As a user, I can view the accurate analytics of data by prepared data. The data preparation is done to restructure and clean the data.	3	High	Sivavel R Thiru murugan R Praveen kumar R Raghul V Prem kumar R
Sprint-2	Data Exploration	USN-3	As a user, I can view the visualized data to get the better understanding about the sales, stock, revenue and price.	8	High	Sivavel R Thiru murugan R Praveen kumar R Raghul V Prem kumar R
Sprint-3	Dashboard Creation	USN-4	As a user, I can view the different visualization in the dashboard about the sales, stock, revenue and price.	8	High	Sivavel R Thiru murugan R Praveen kumar R Raghul V Prem kumar R

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
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	Sivavel R Thiru murugan R Praveen kumar R Raghul V Prem kumar R
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 on the story.	8	High	Sivavel R Thiru murugan R Praveen kumar R Raghul V Prem kumar R

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	5	6 Days	24 Oct 2022	29 Oct 2022	5	29 Oct 2022
Sprint-2	8	6 Days	31 Oct 2022	05 Nov 2022	8	05 Nov 2022
Sprint-3	8	6 Days	07 Nov 2022	12 Nov 2022	8	12 Nov 2022
Sprint-4	16	6 Days	14 Nov 2022	19 Nov 2022	16	19 Nov 2022

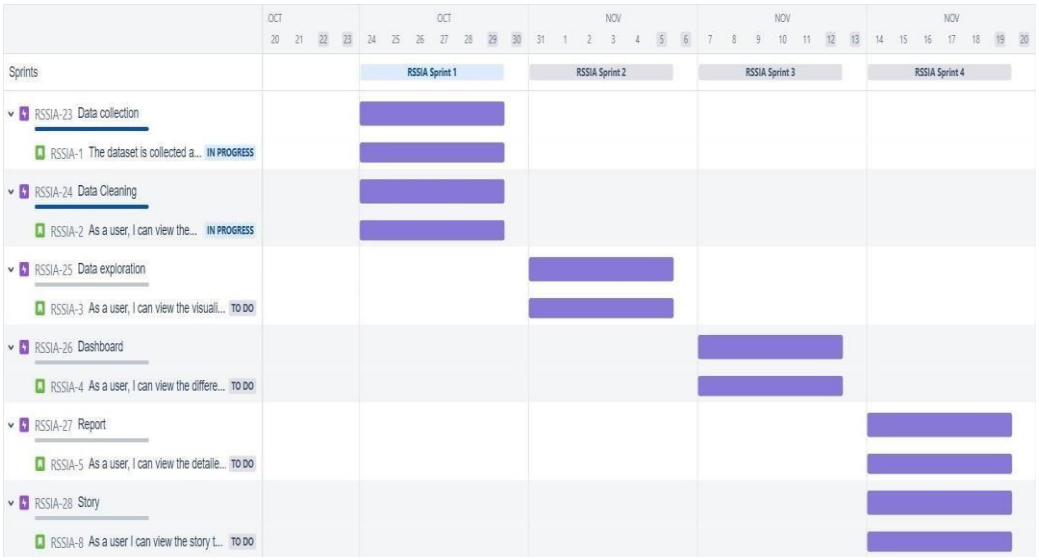
Velocity:

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)

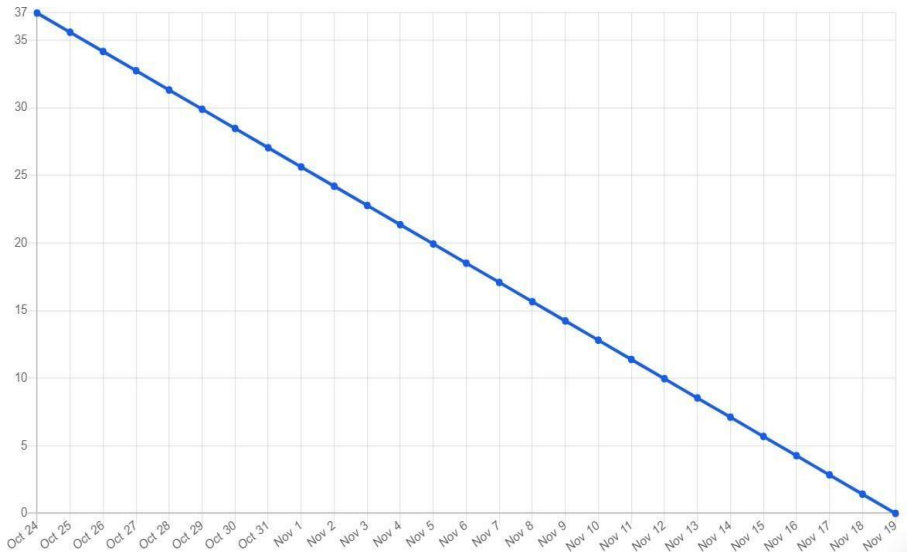
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Sprint	Story points	Duration	Average velocity
Sprint-1	5	6	0.83
Sprint-2	8	6	1.33
Sprint-3	8	6	1.33
Sprint-4	16	6	2.66
Total	37	24	1.54

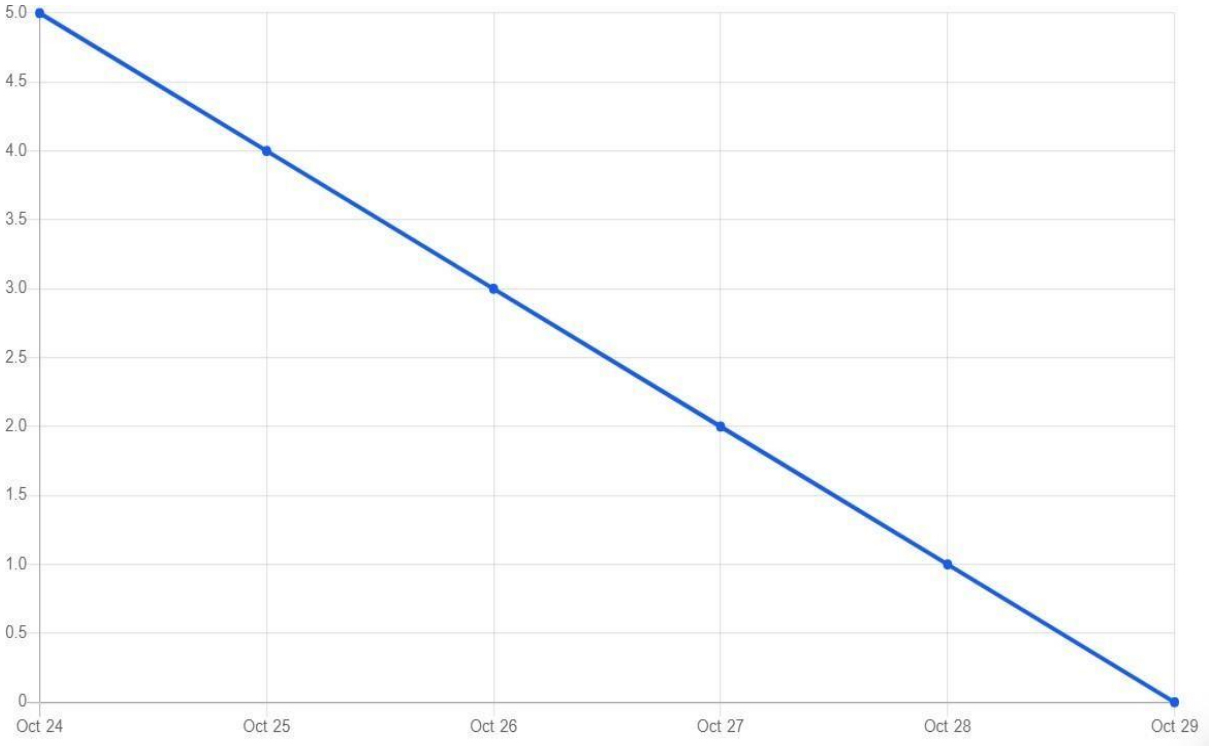
Jira project planning:



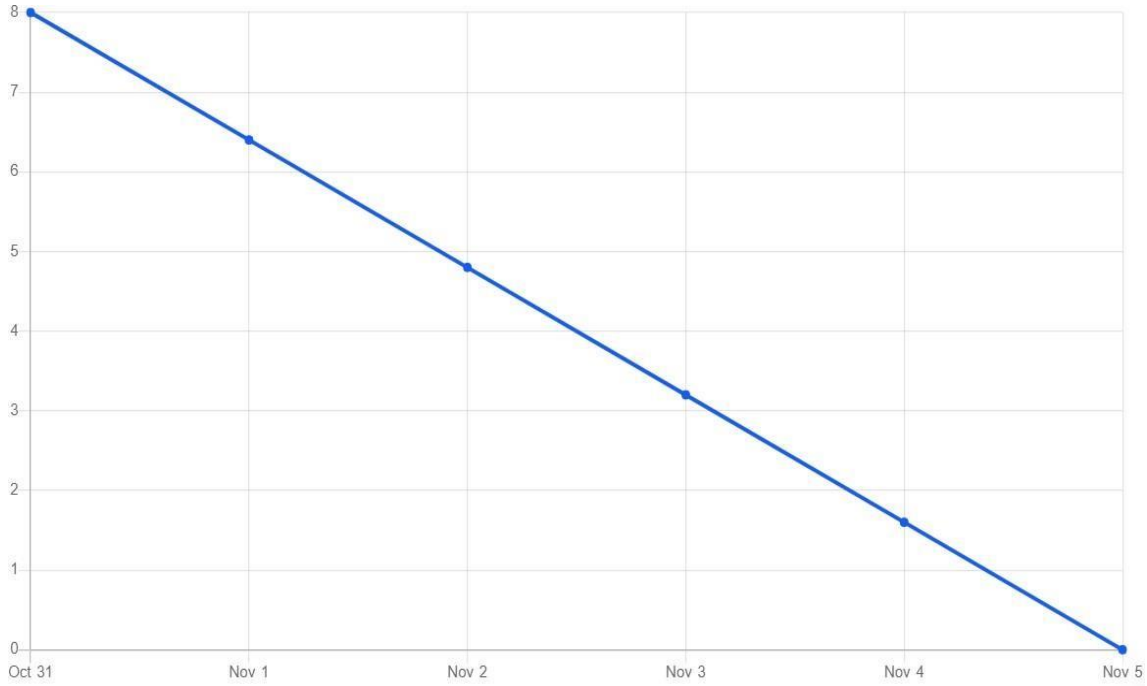
Burndown Chart:



Sprint 1:



Sprint 2:



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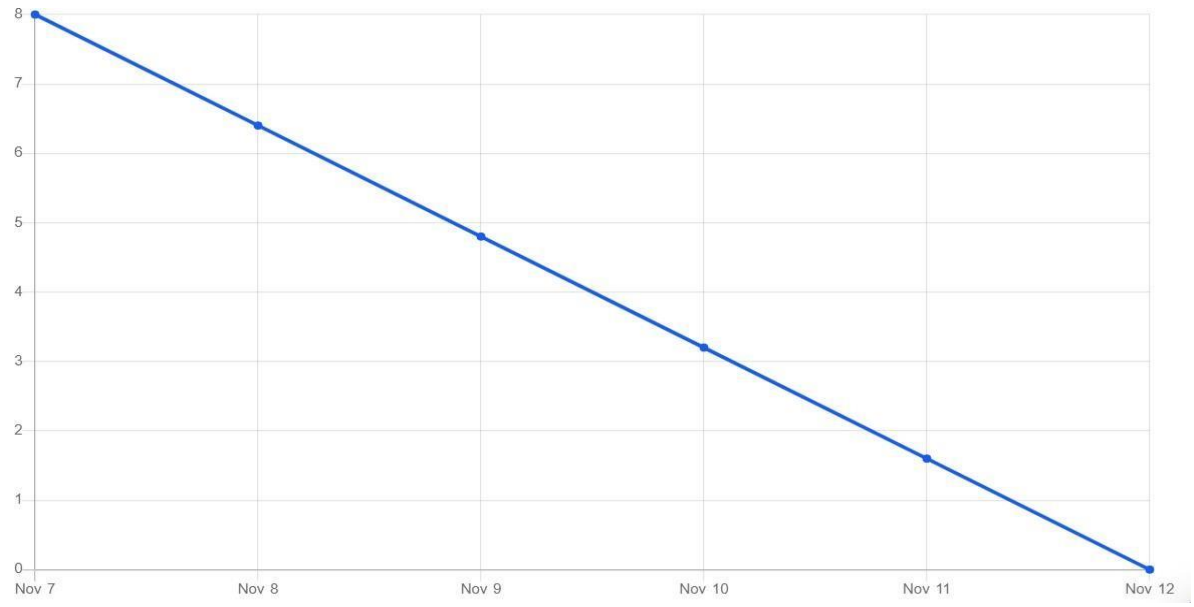
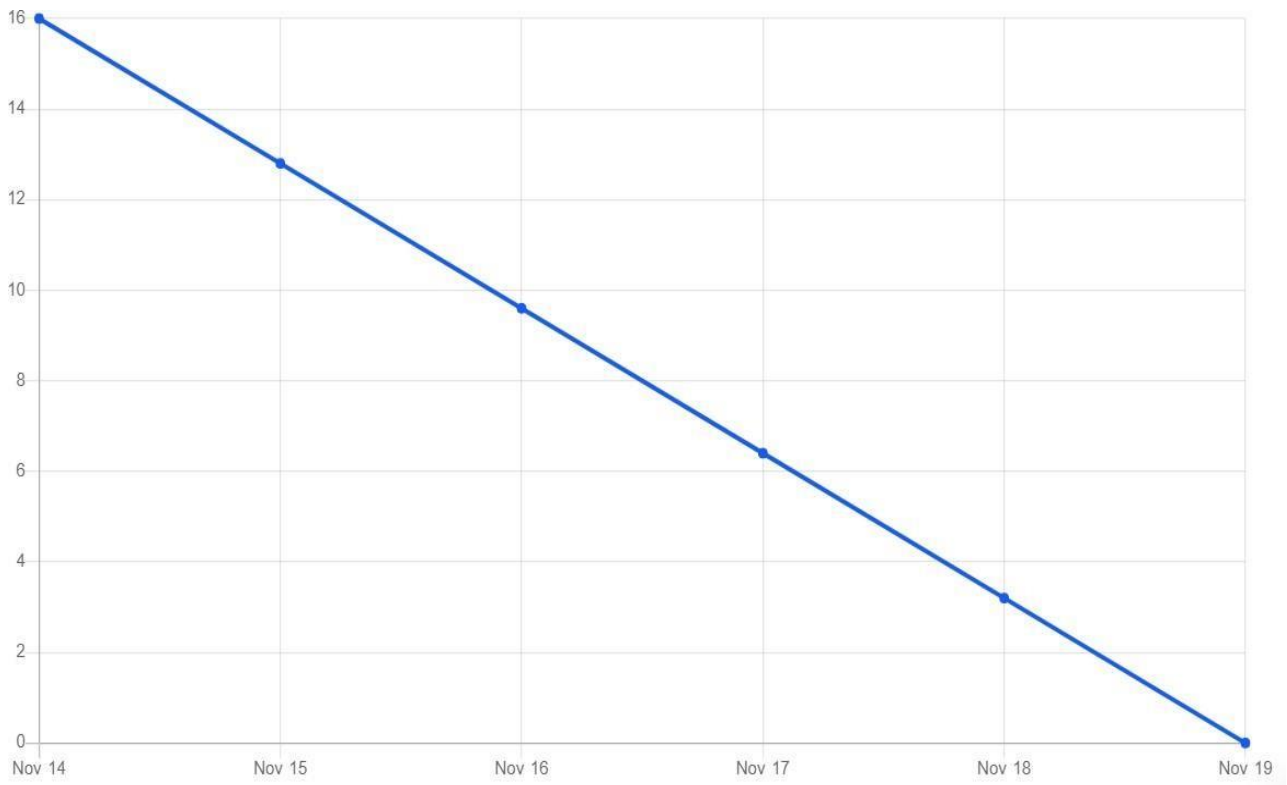


Sprint 4:



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:

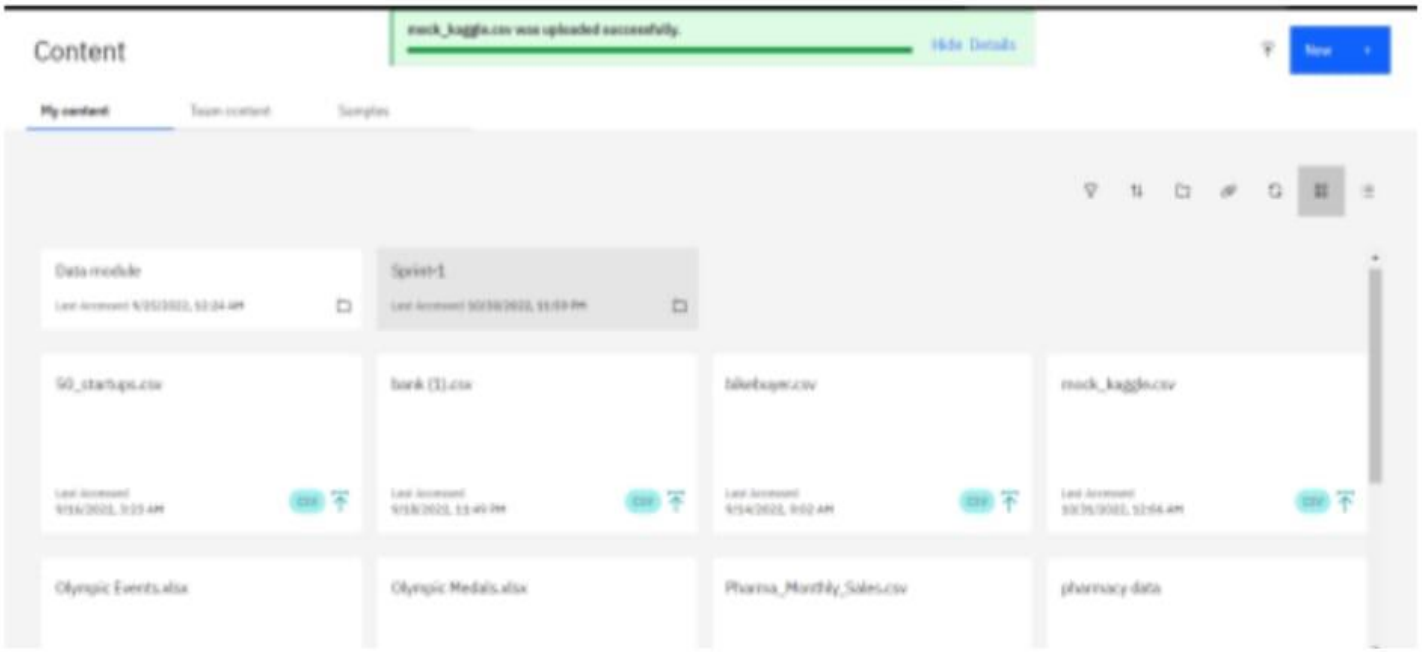
Data Collection:

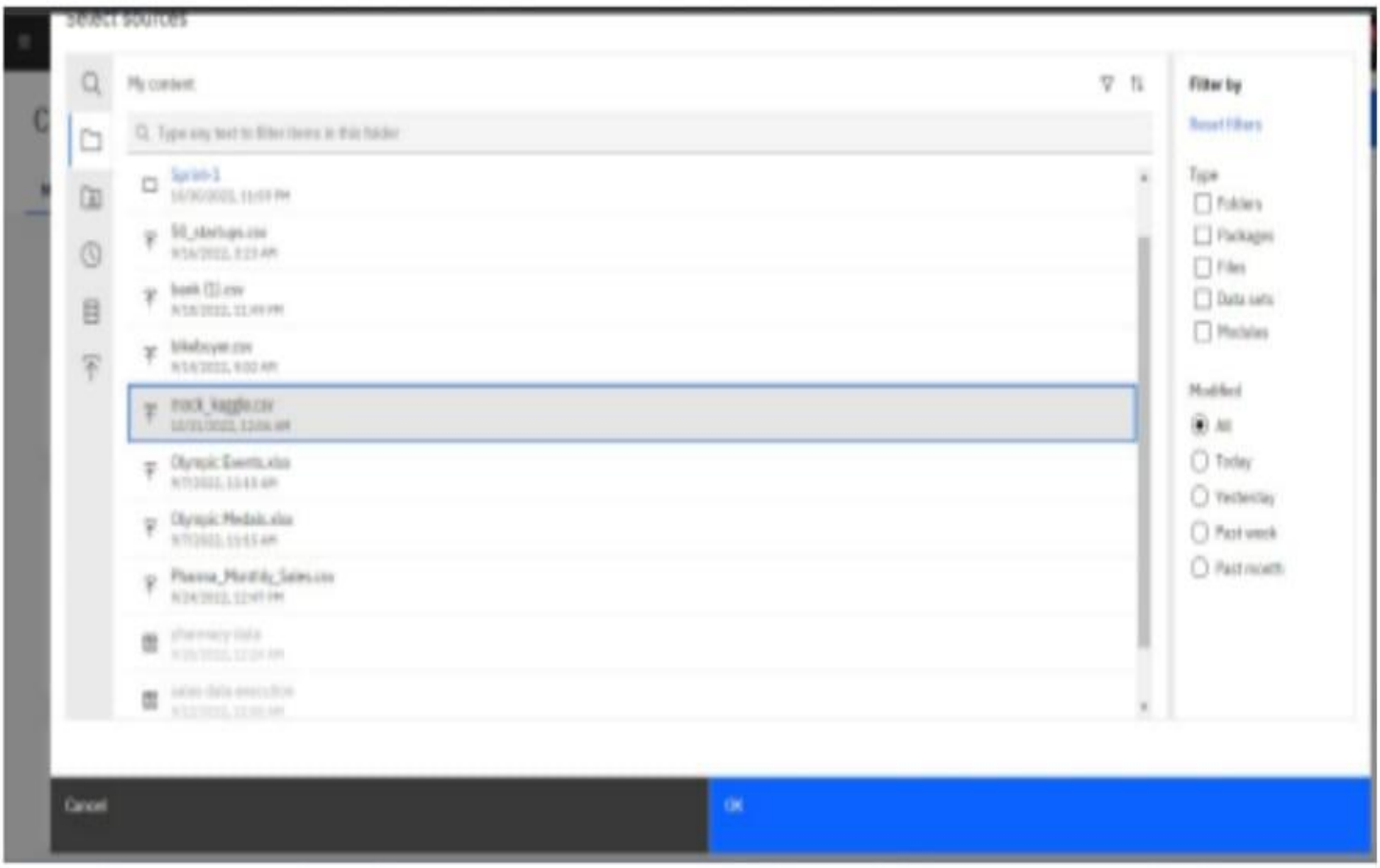
Download the Dataset

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

Load the Dataset:

Tool used – IBM Cognos



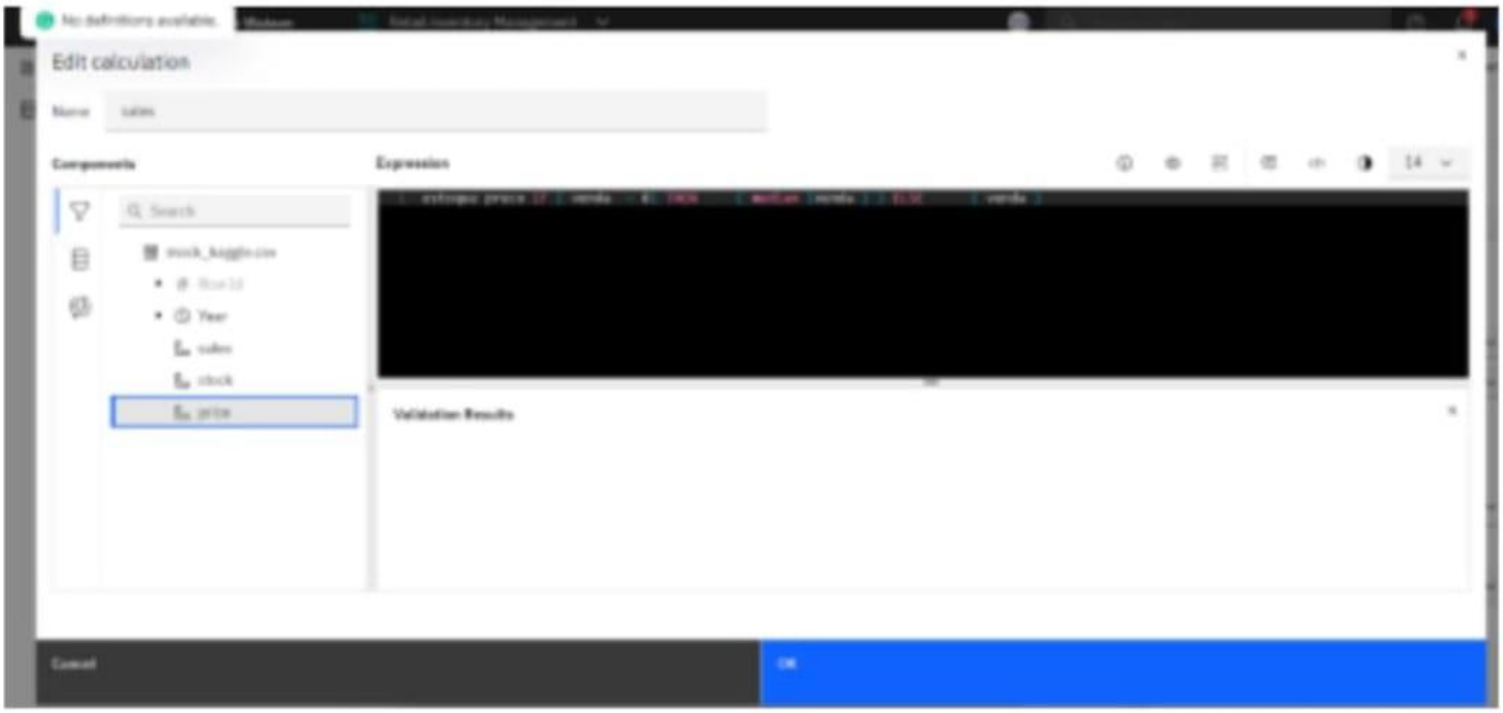

Select sources
My content
Filter by
Reset filters
Type
Folders
Packages
Files
Data sets
Modified
All
Today
Yesterday
Past week
Past month
Cancel
OK

Month Data


Create calculation
Name
Month data
Components
Expressions
Validation Results
The expression is valid.
Cancel
OK


Edit calculation
Name
tshirt
Components
Expression
Validation Results
This expression is valid.
Cancel


No definitions available
Edit calculation
Name
Components
Expression
Validation Results
Cancel
OK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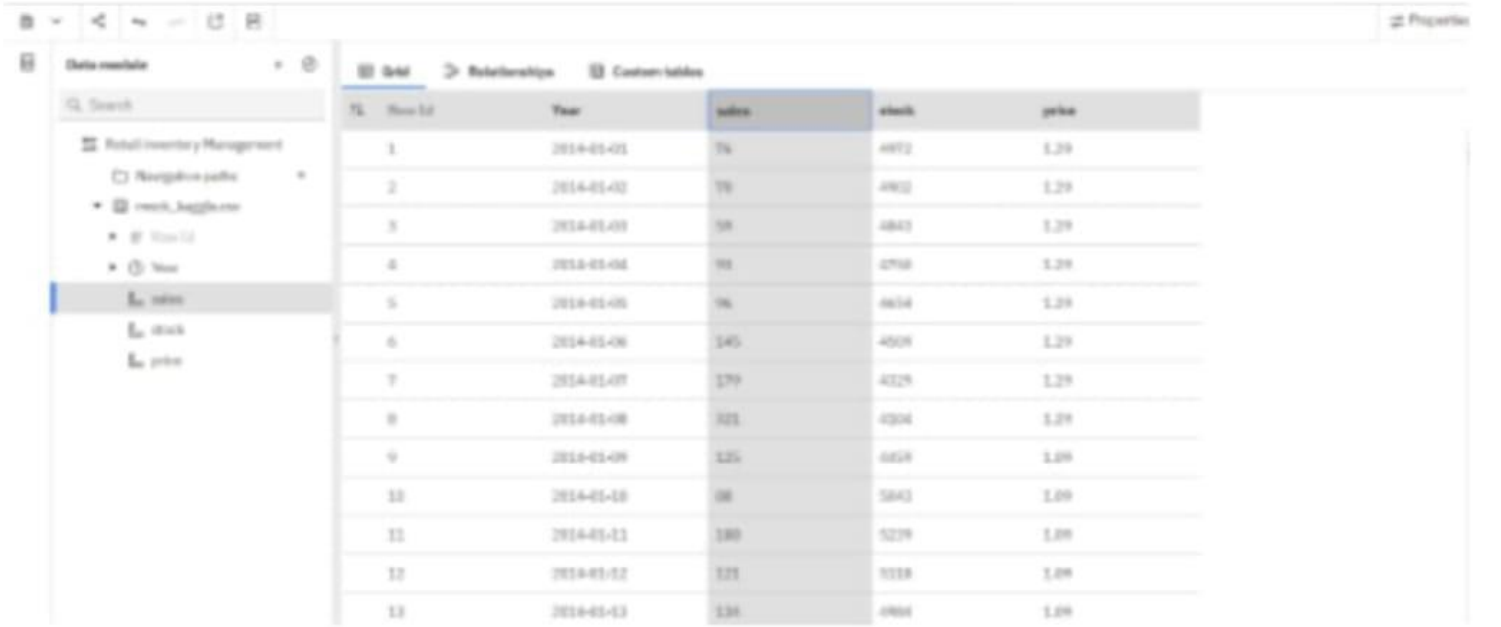
Name
sales
Components
Expression
Search
mock_kaggle.csv
Row Id
Year
sales
stock
price
Validation Results
Cancel
OK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Data module
Search
Retail Inventory Management
Navigation paths
mock_kaggle.csv
Row Id
Year
sales
stock
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Grid
Relationships
Custom tables
Row Id
Year
sales
stock
price
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2 2014-01-02 79 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 4204 1.29
9 2014-01-09 125 4079 1.09
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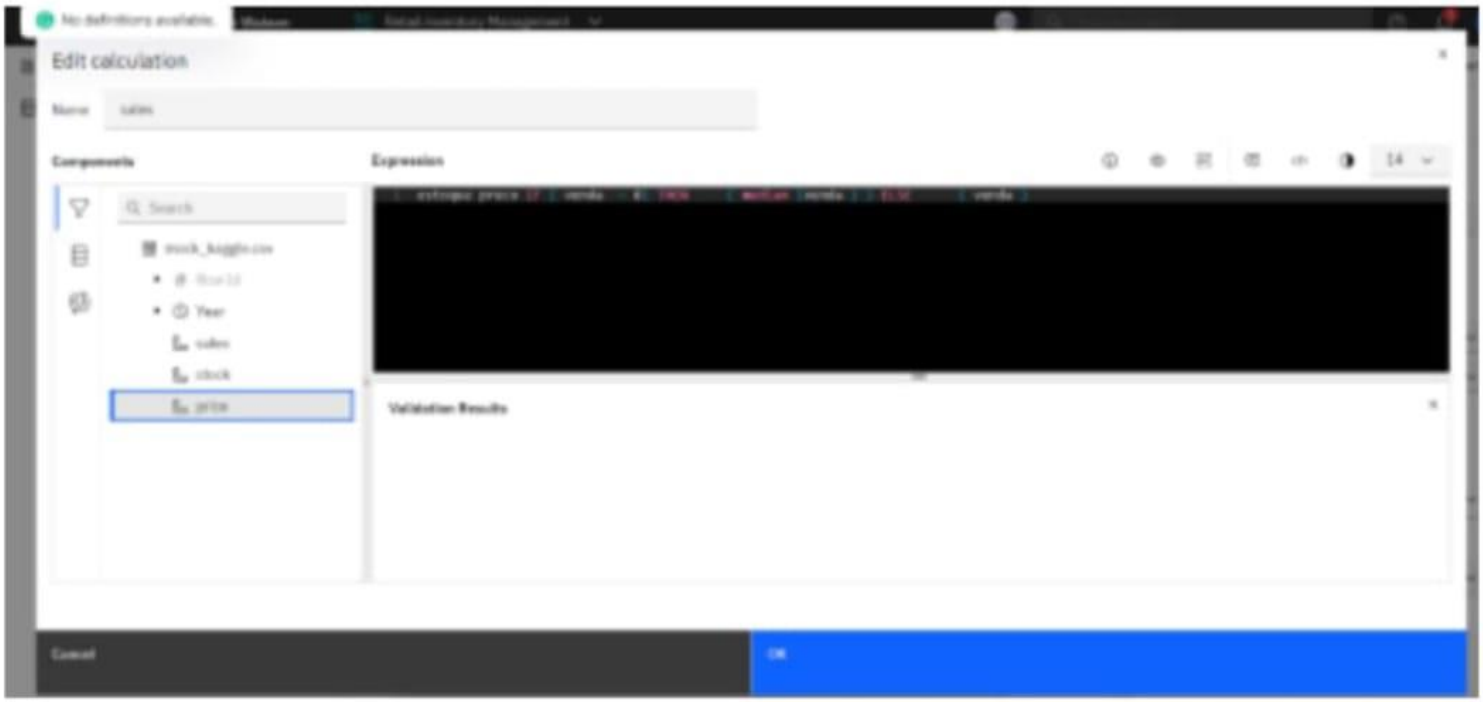
12 2014-01-12 121 3158 1.09
13 2014-01-13 136 3064 1.09


Edit calculation
Name
sales
Components
Expression
Search
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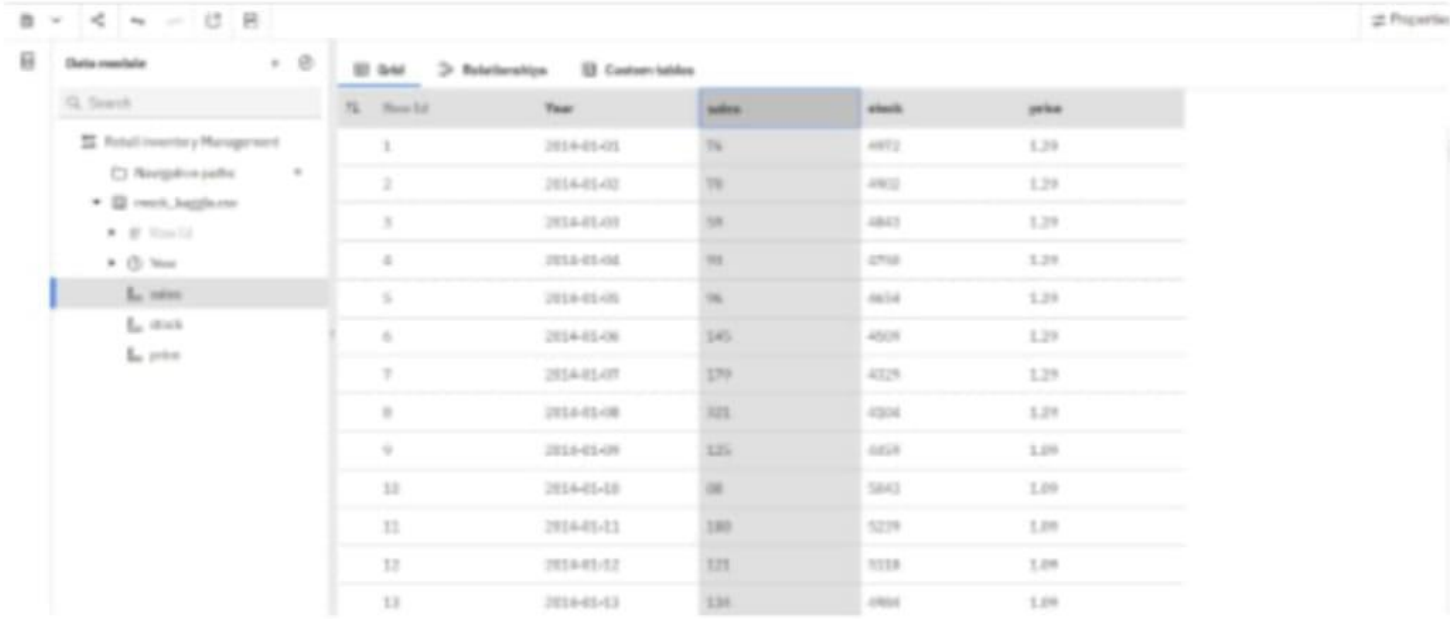
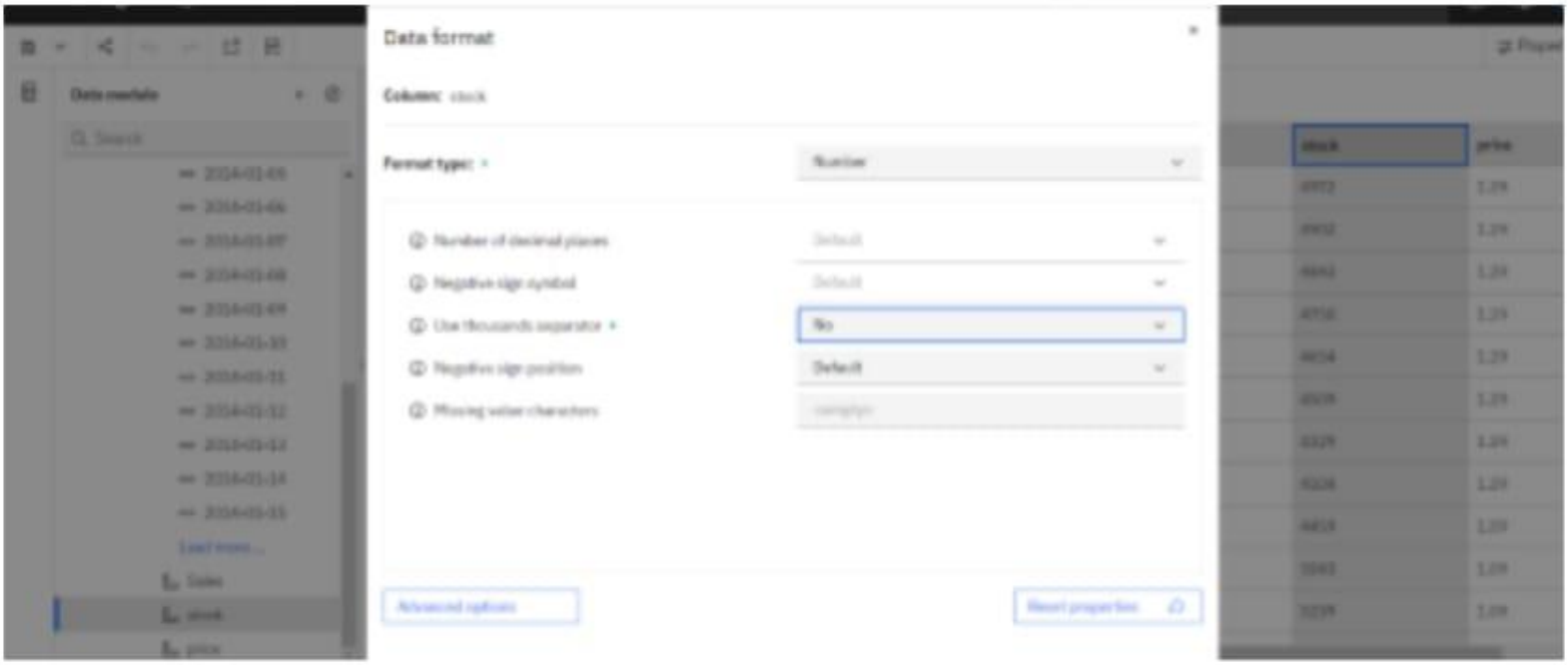
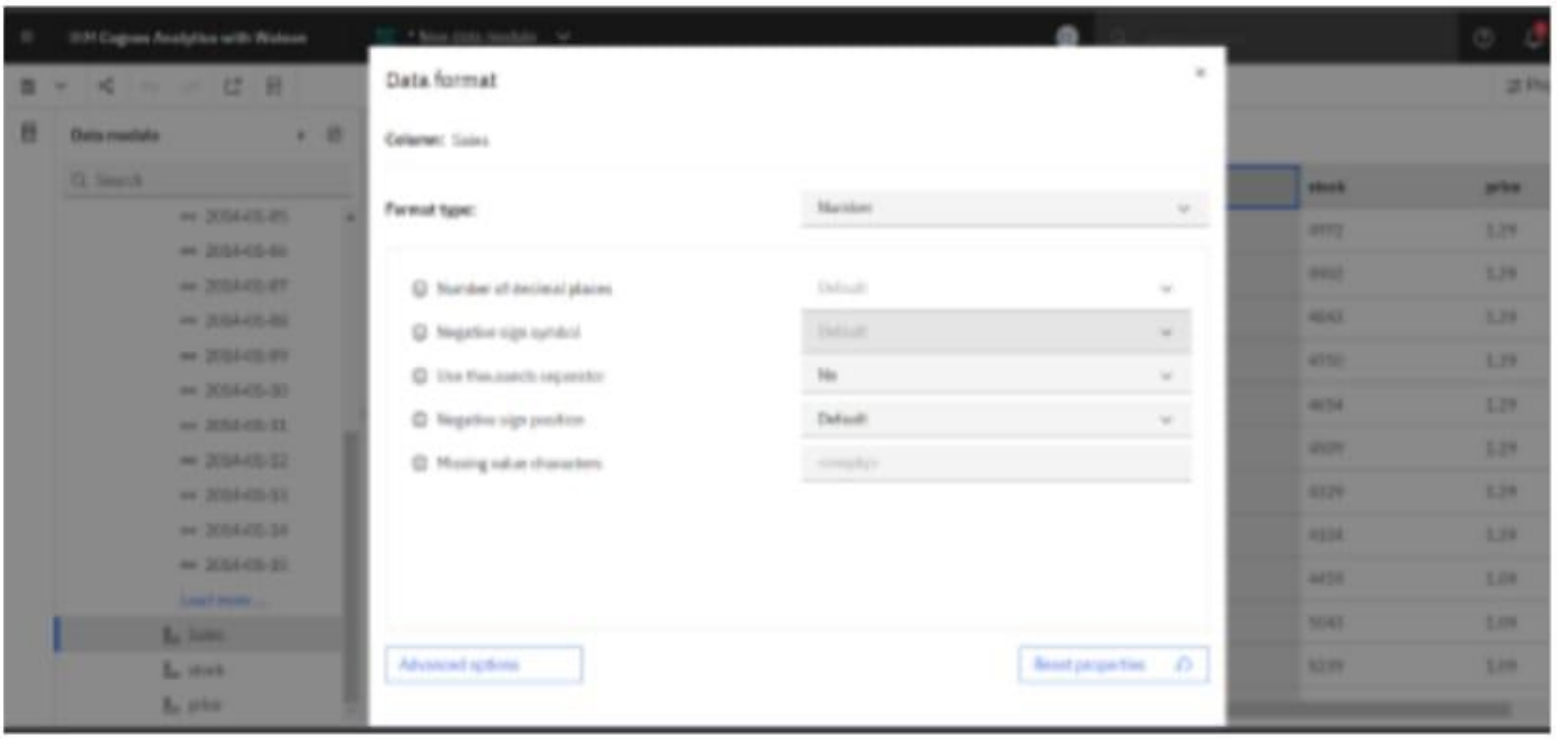
Validation Results
Cancel
OK


Data models
Search
Retail Inventory Management
Year
sales
stock
price
Grid
Relationships
Custom tables
Row Id
Year
sales
stock
price

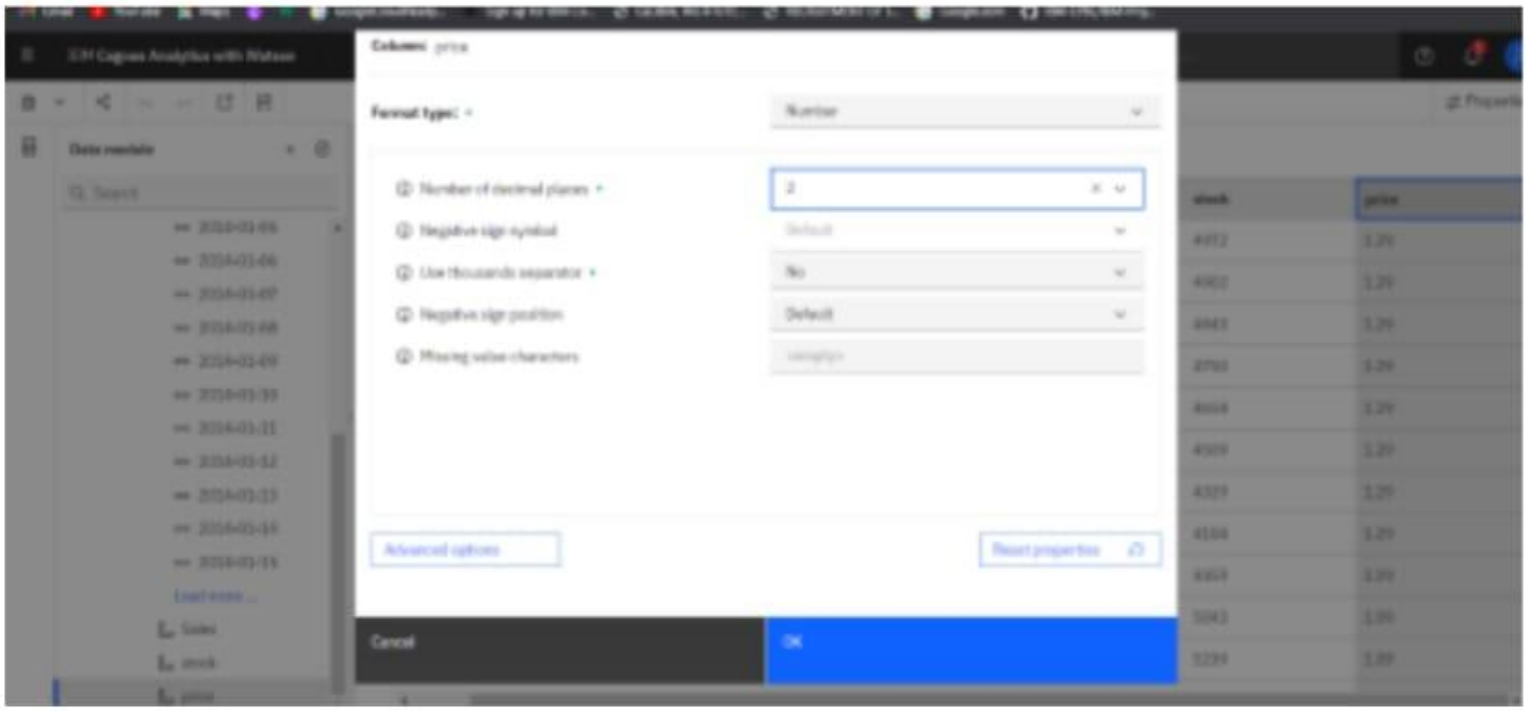
Stock format Data:



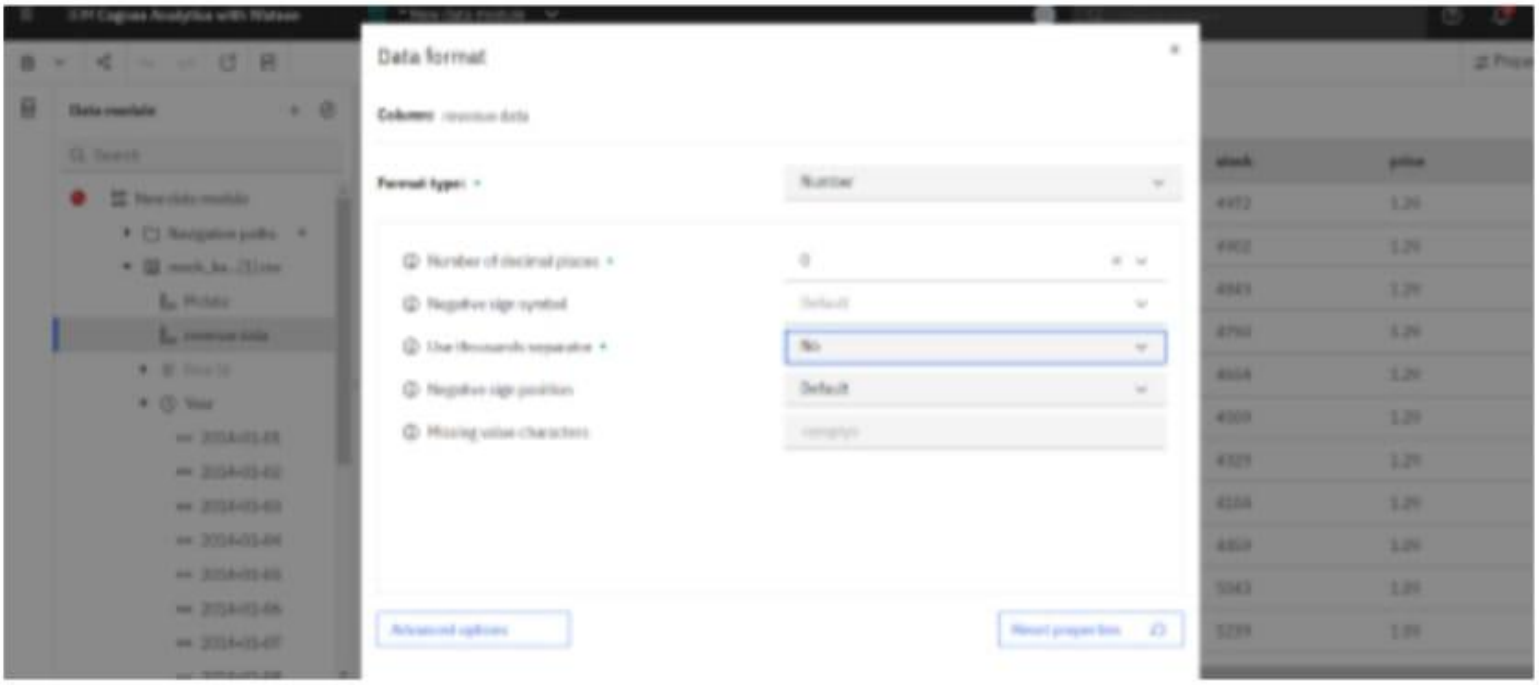
Sales Format Data:



Price Format data:



Revenue 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 COLORED BY 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

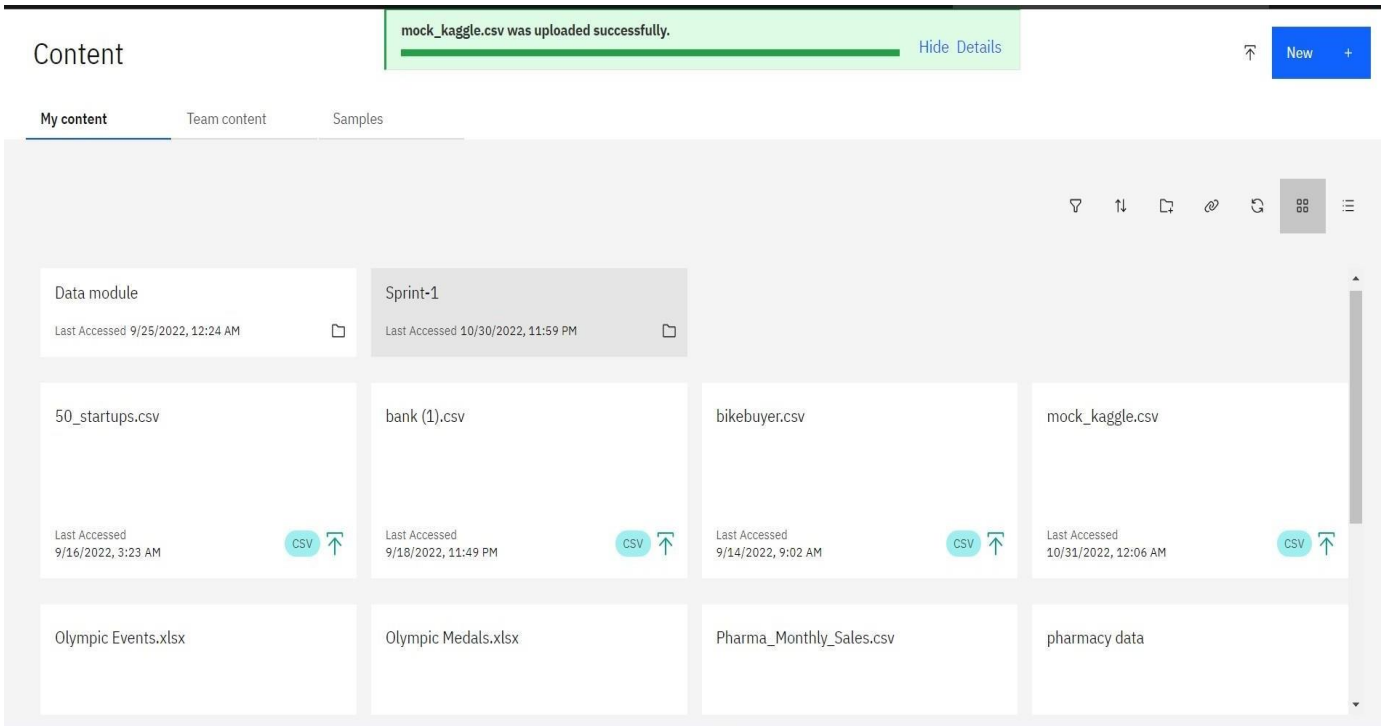
DATA COLLECTION:

Download the Dataset

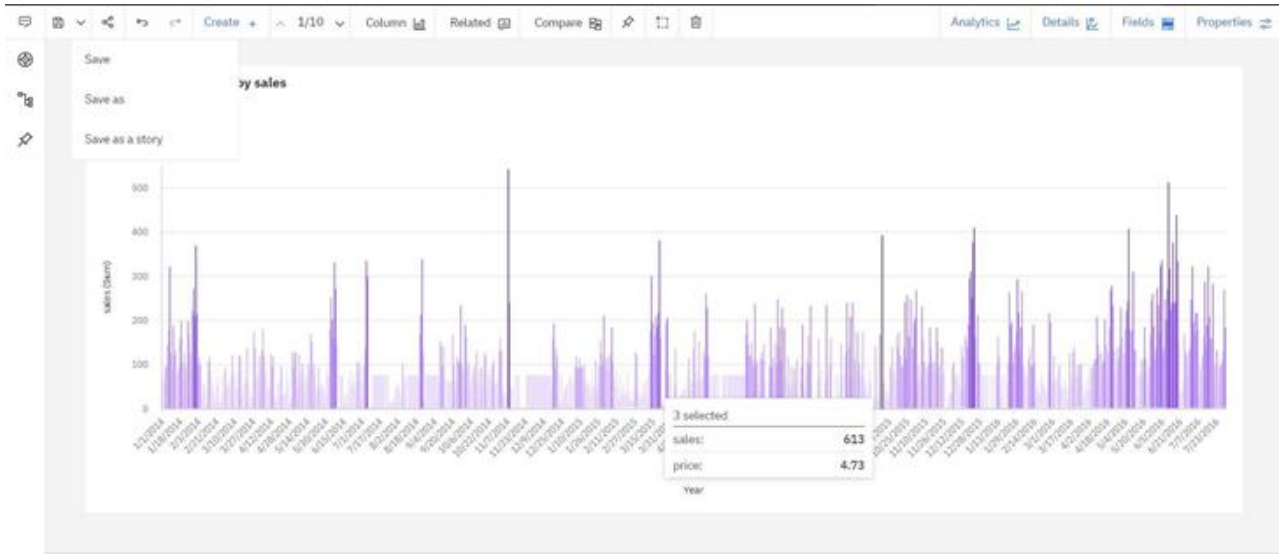
Dataset link - https://drive.google.com/drive/folders/1kiL5CHJmQvbk9VyFsuUs-myAupBZGNy

LOAD THE DATASET:

Tool used – IBM Cognos



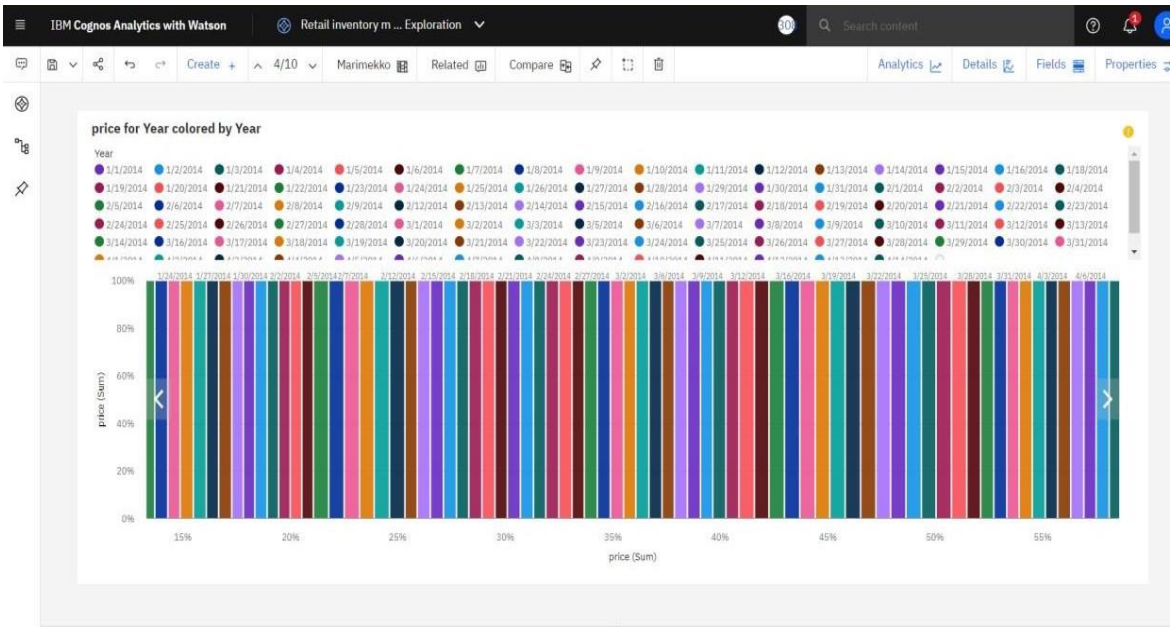
SALES ANALYSIS:



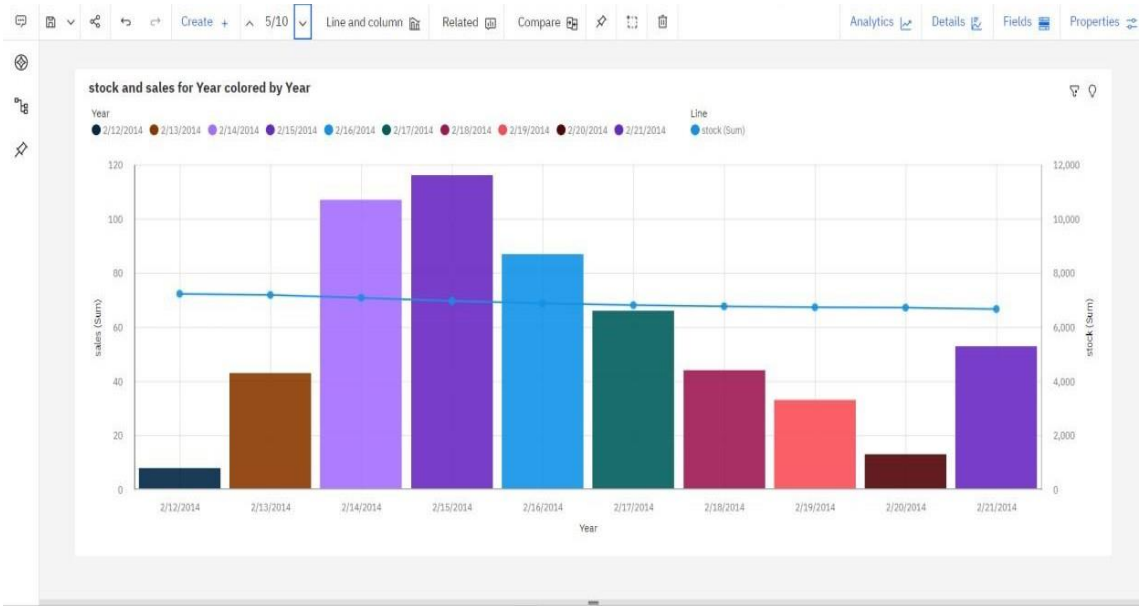
PRICE ANALYSIS:

STOCK AND PRICE FOR YEAR COLORED BY PRICE:

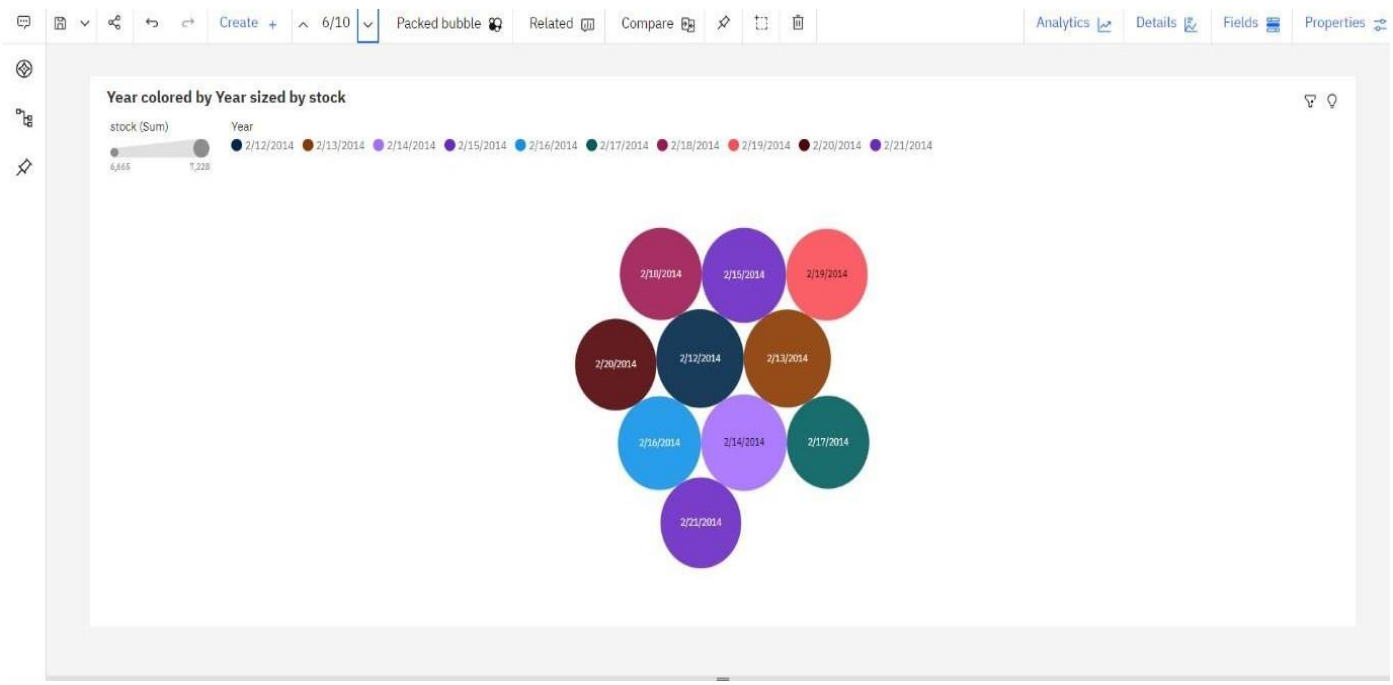
PRICE FOR YEAR COLORED BY YEAR:



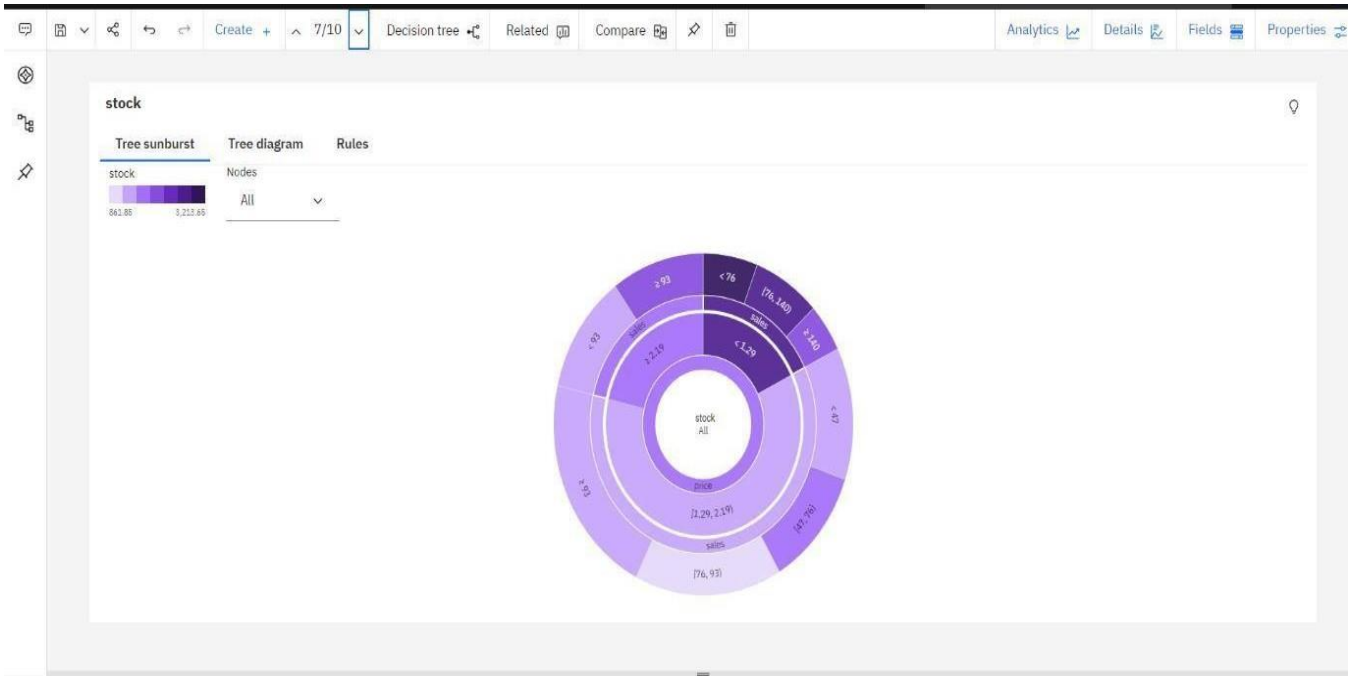
STOCK AND SALES FOR YEAR COLORED BY YEAR:



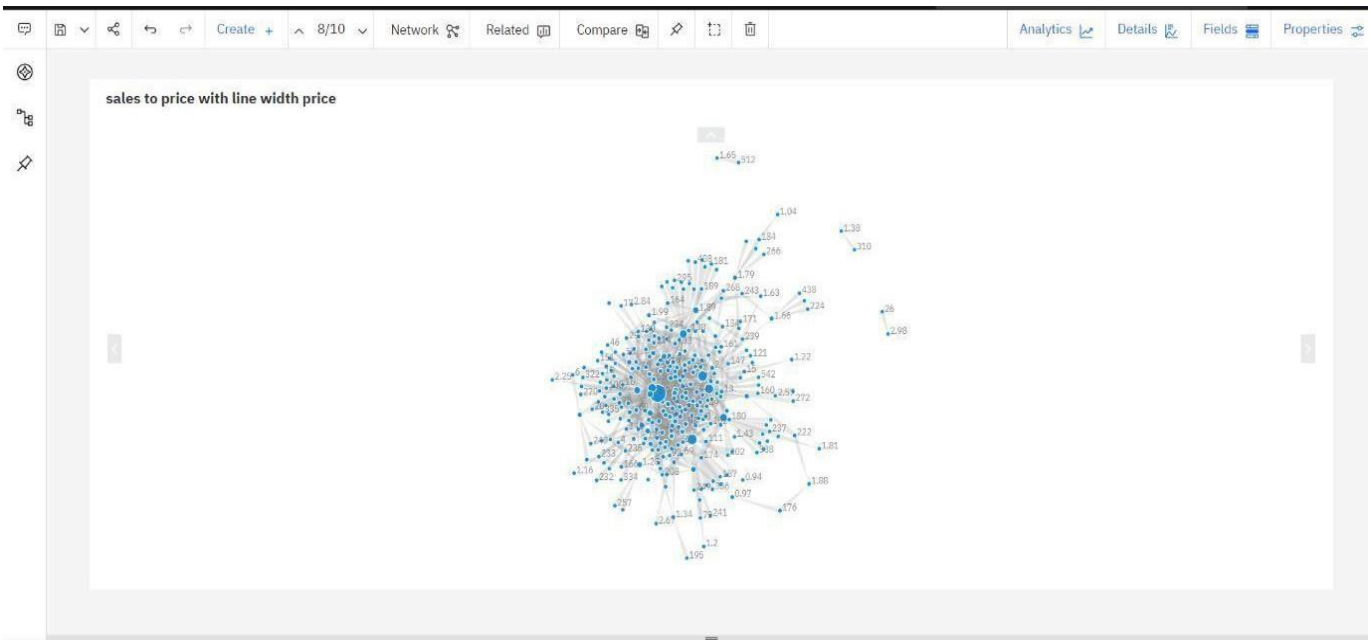
YEAR COLORED BY YEAR SIZED BY STOCK:



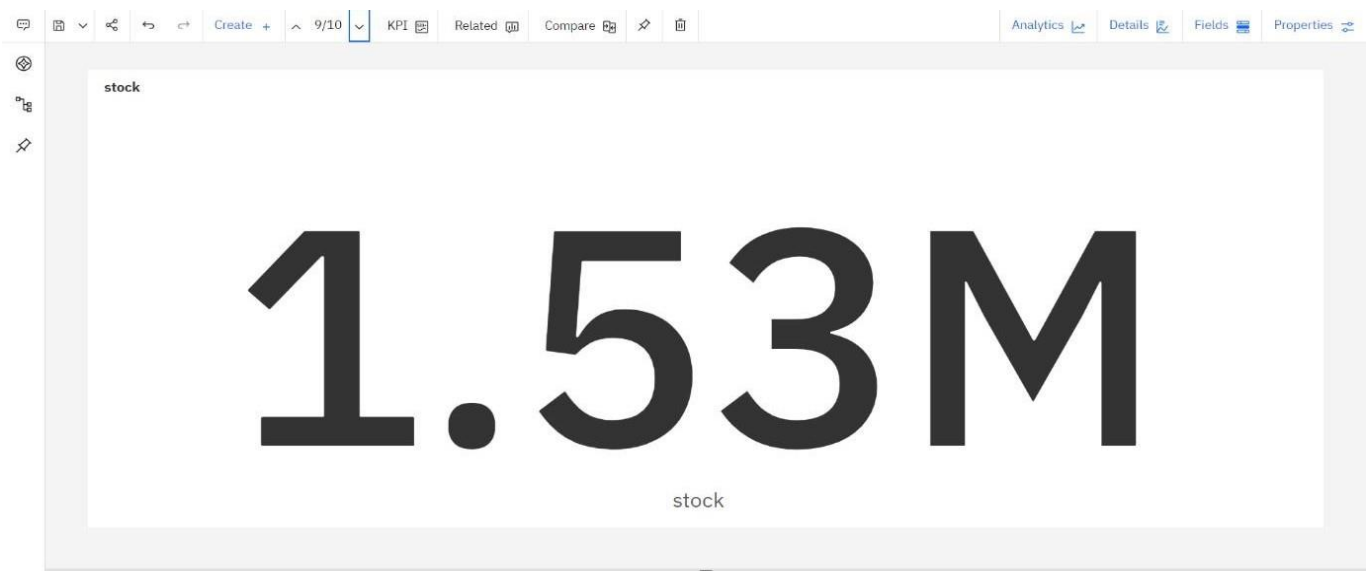
STOCK TREE SUNBURST:



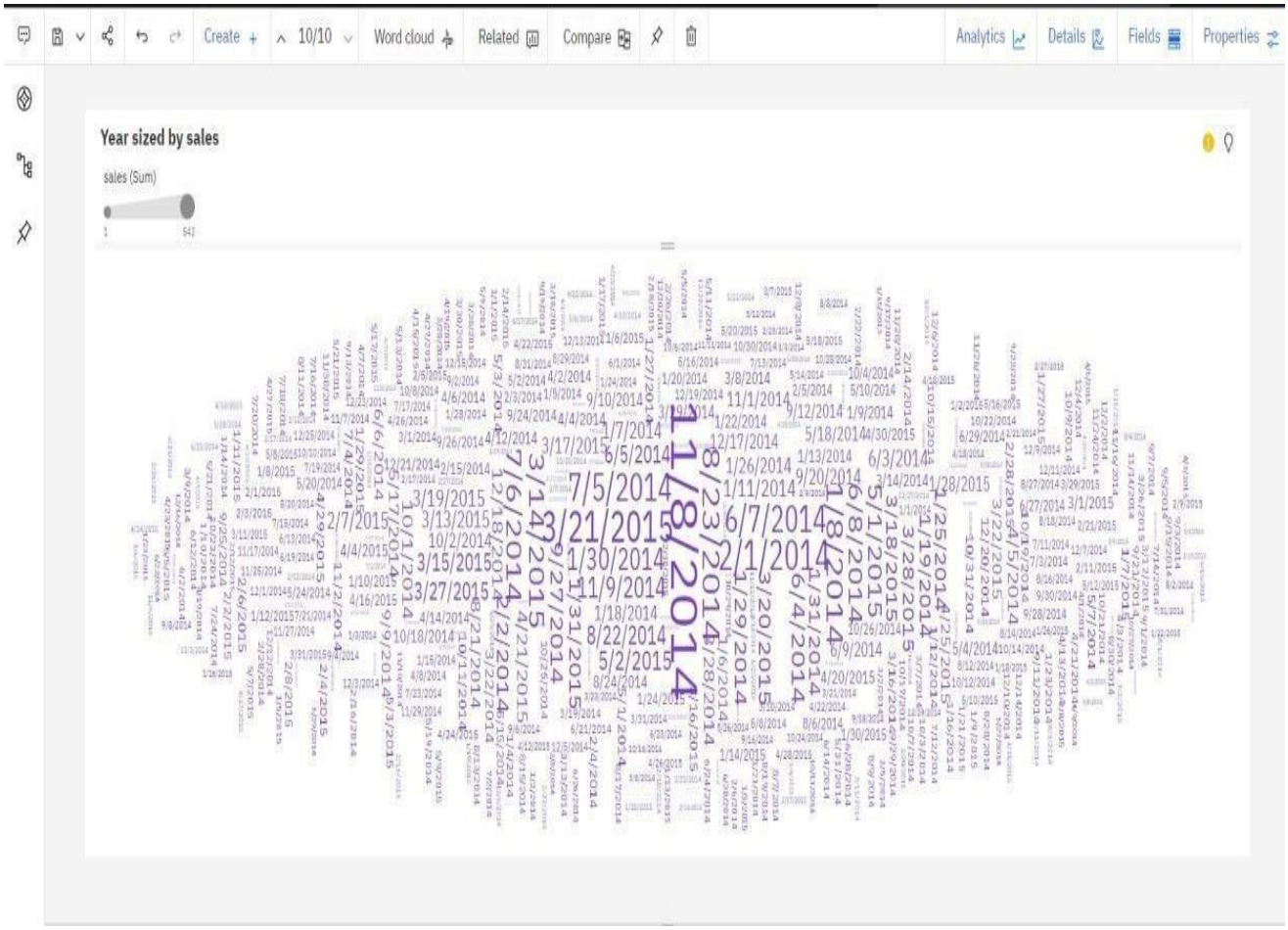
SALES TO PRICE WITH LINE WIDTH PRICE:



STOCK USERS:



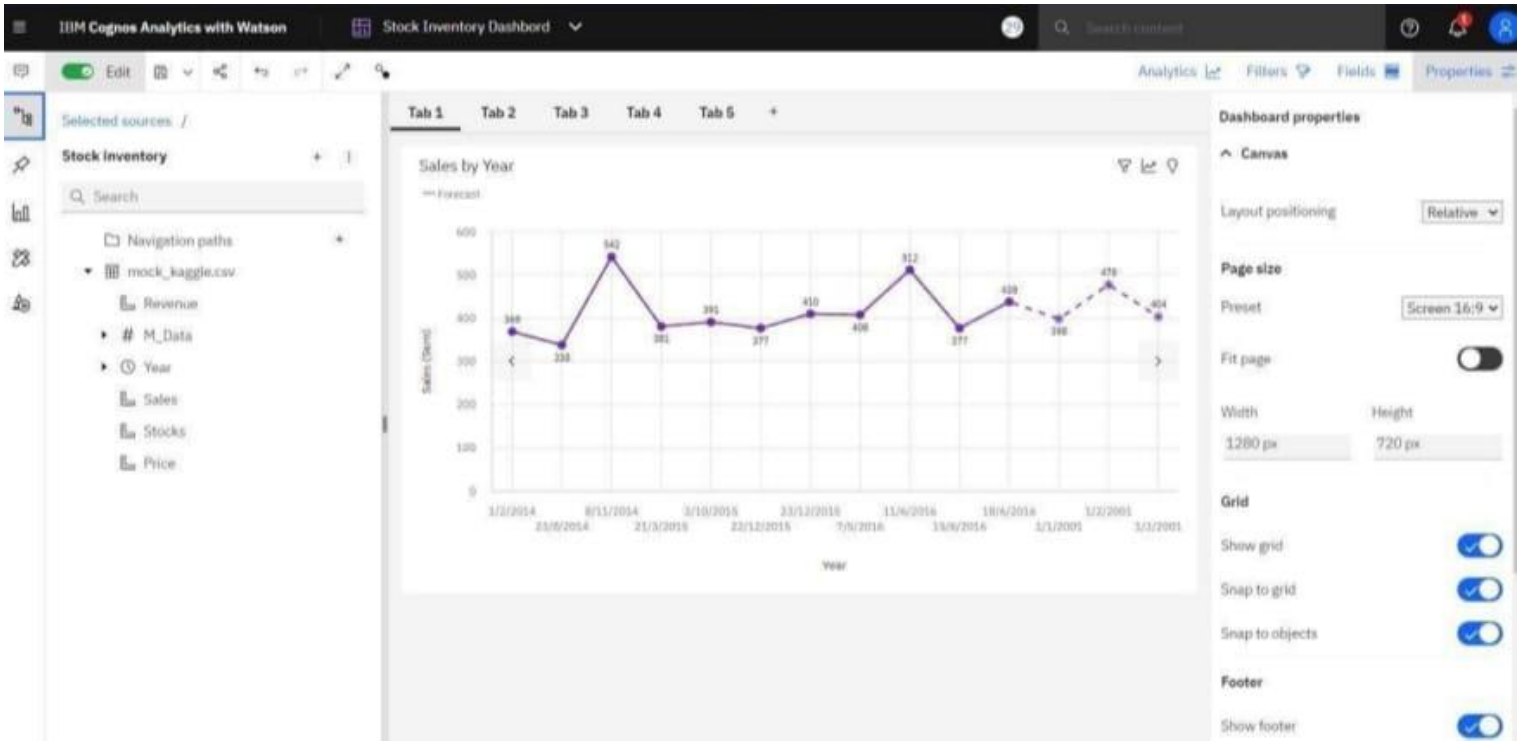
YEAR SIZED BY SALES:



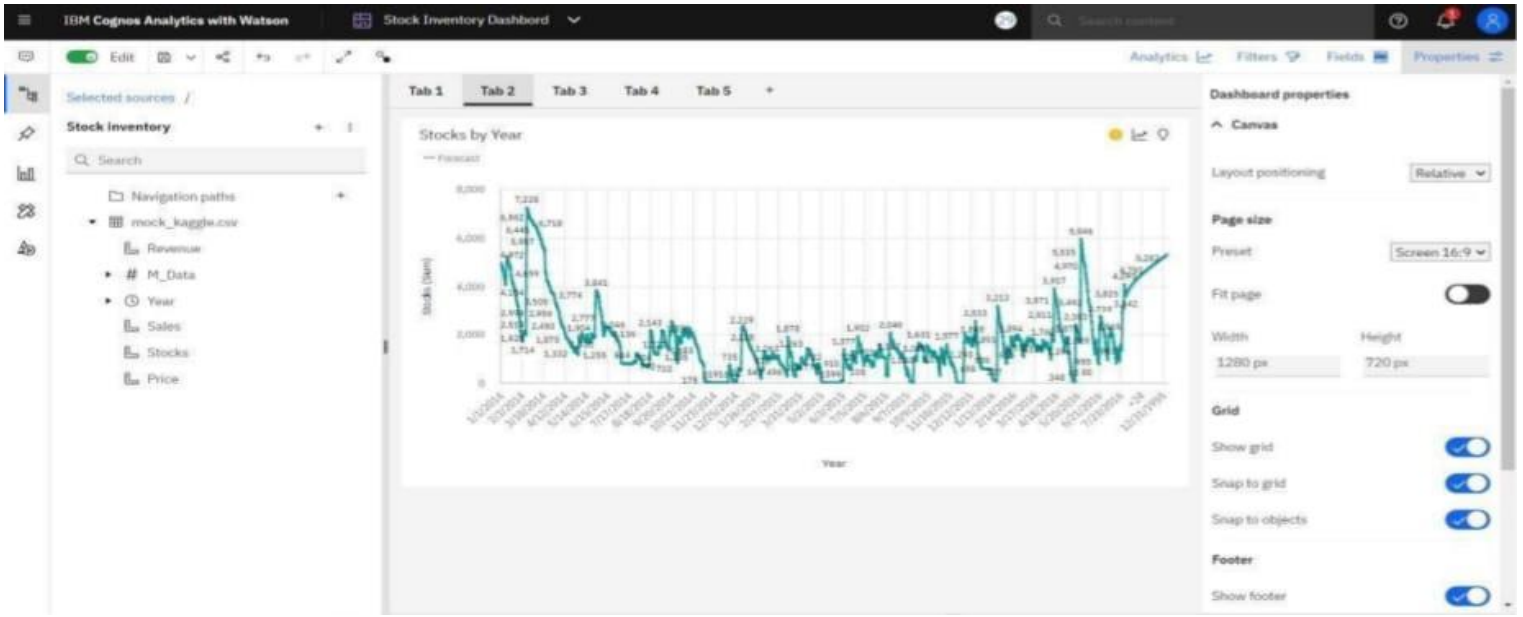
7.3 DELIVERY OF SPRINT 3

Dashboard Creation:

Sales by Year Line Chart

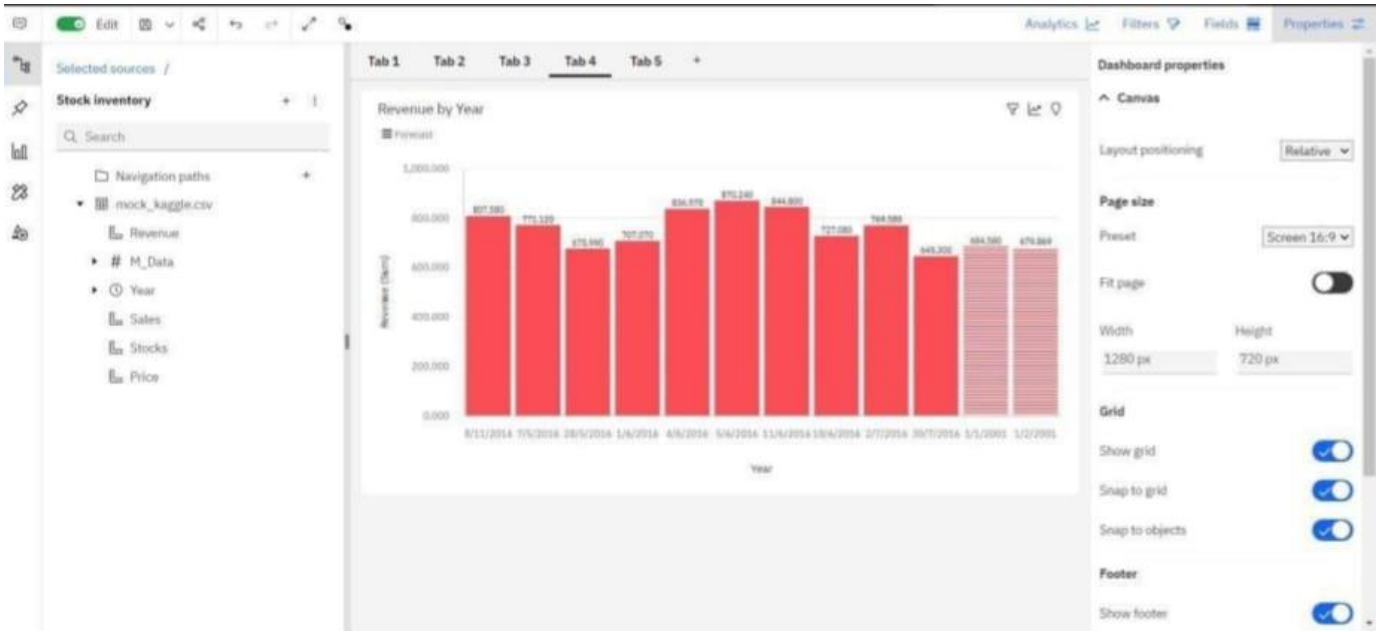


Stock by Year a Line Visual

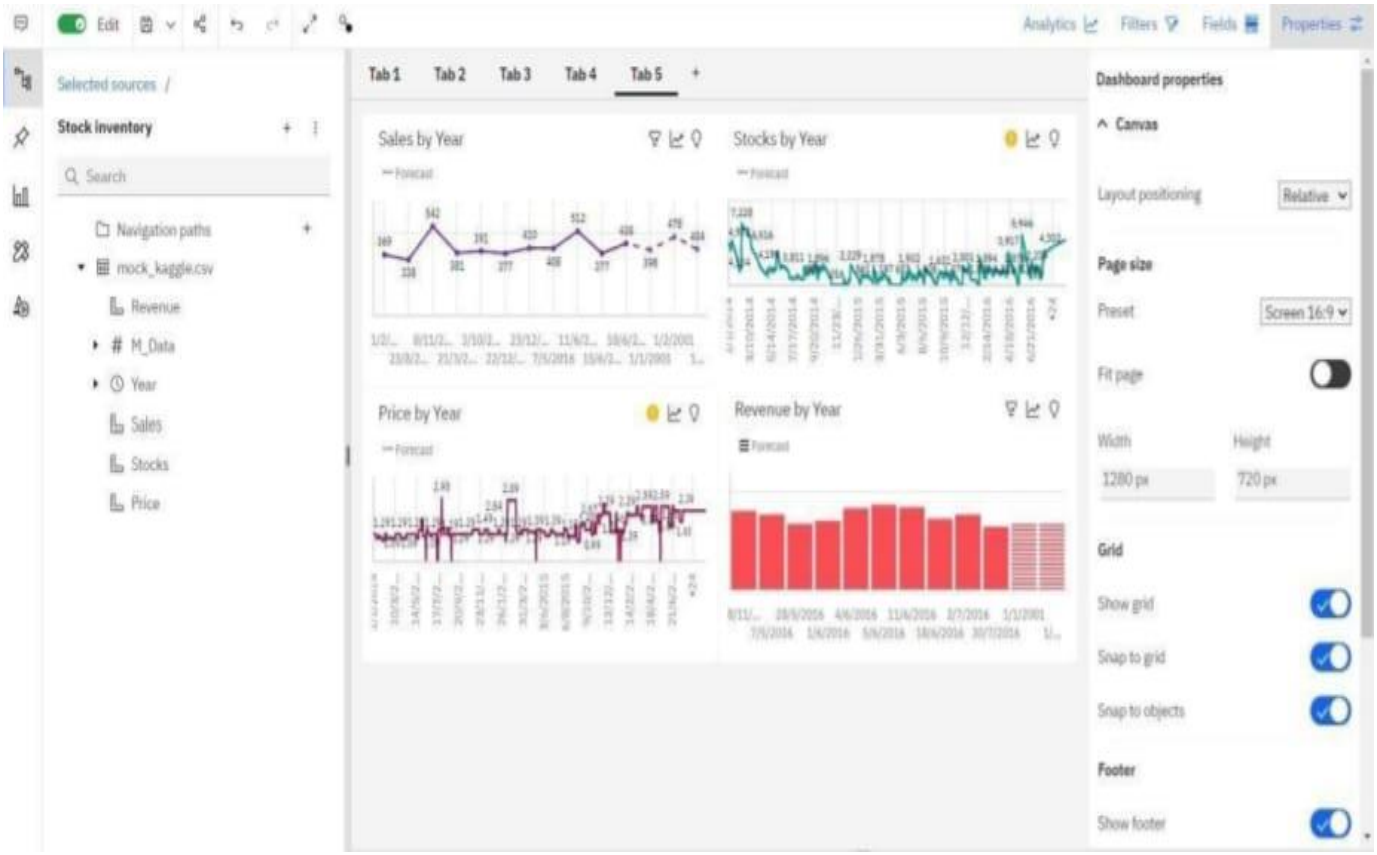


Price by Year Line visual

Revenue by Year Column Forecast visual.

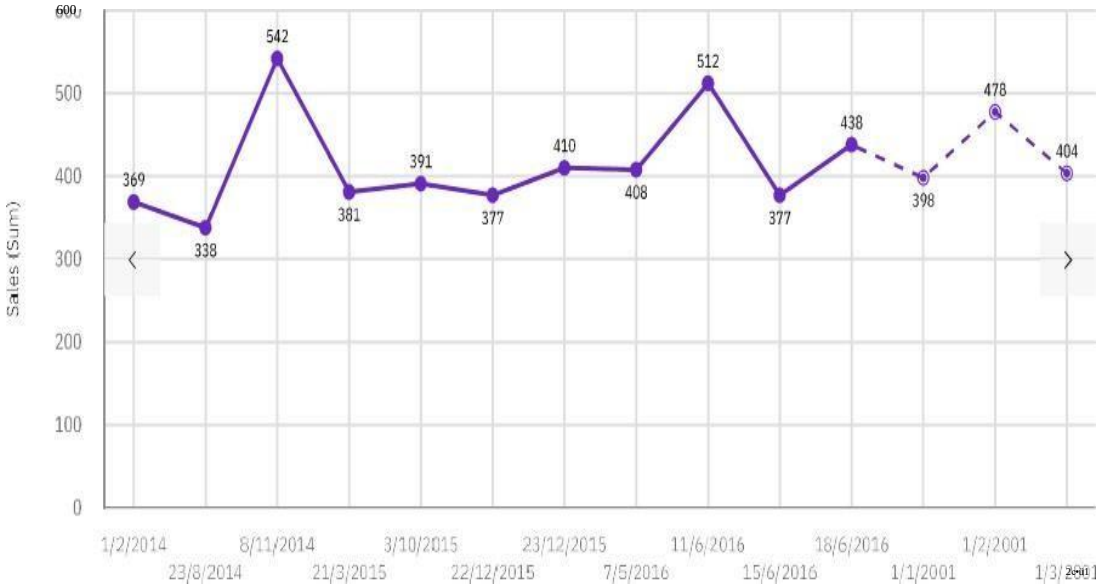


Dashboard creation.

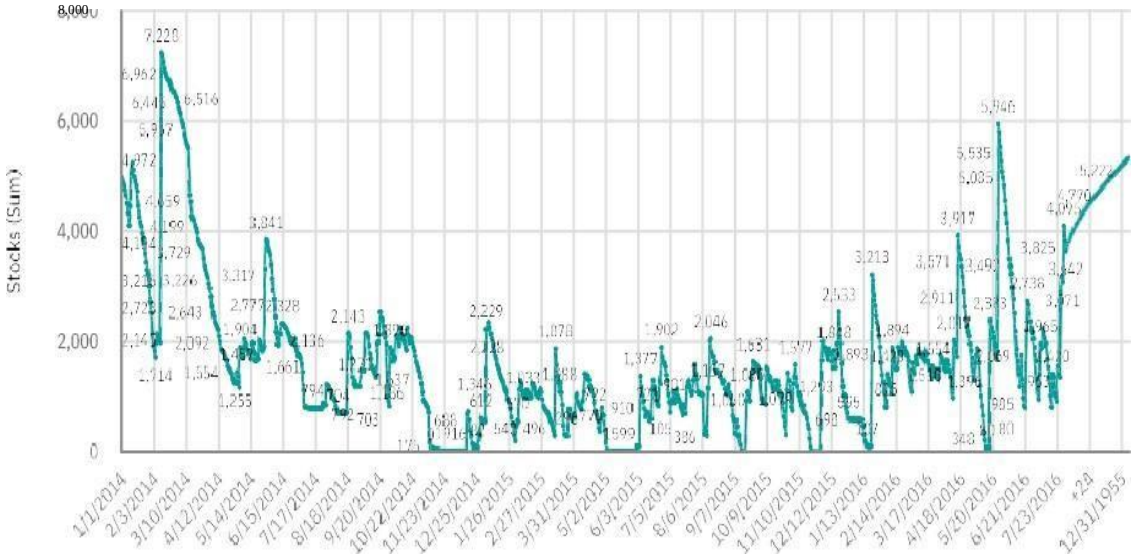


Dashboard:
Stock inventory dashboard

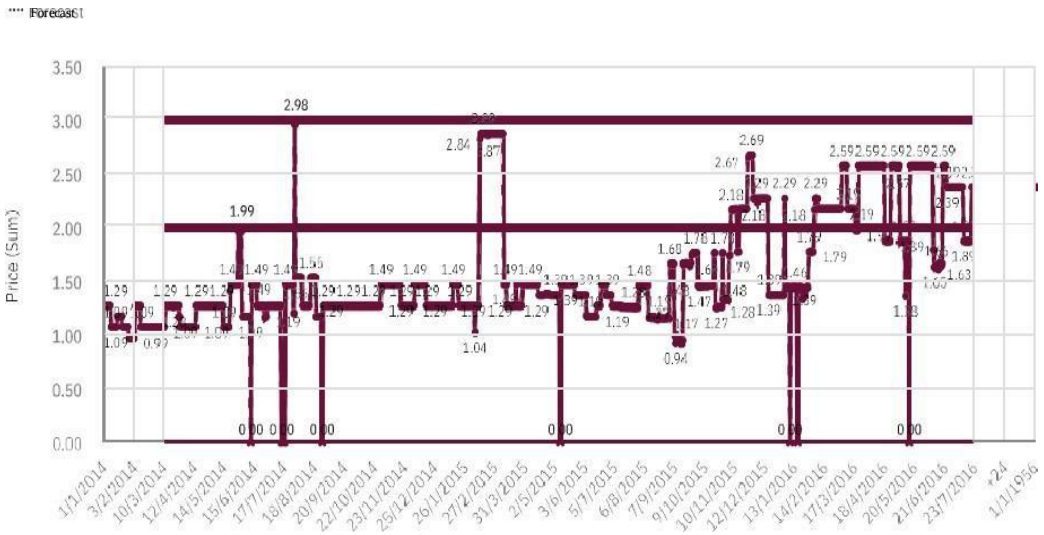
1) Forecast by years:



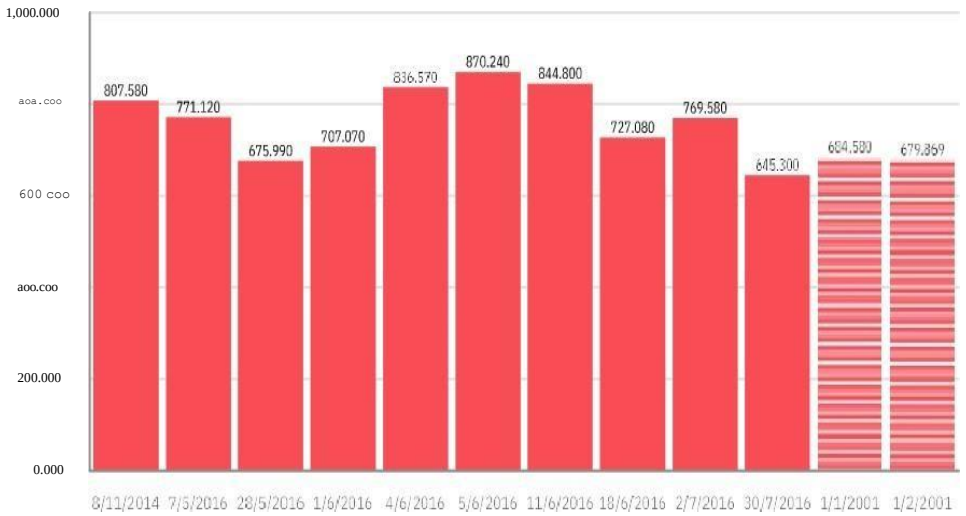
2) Stocks by years:



3) Price by years:

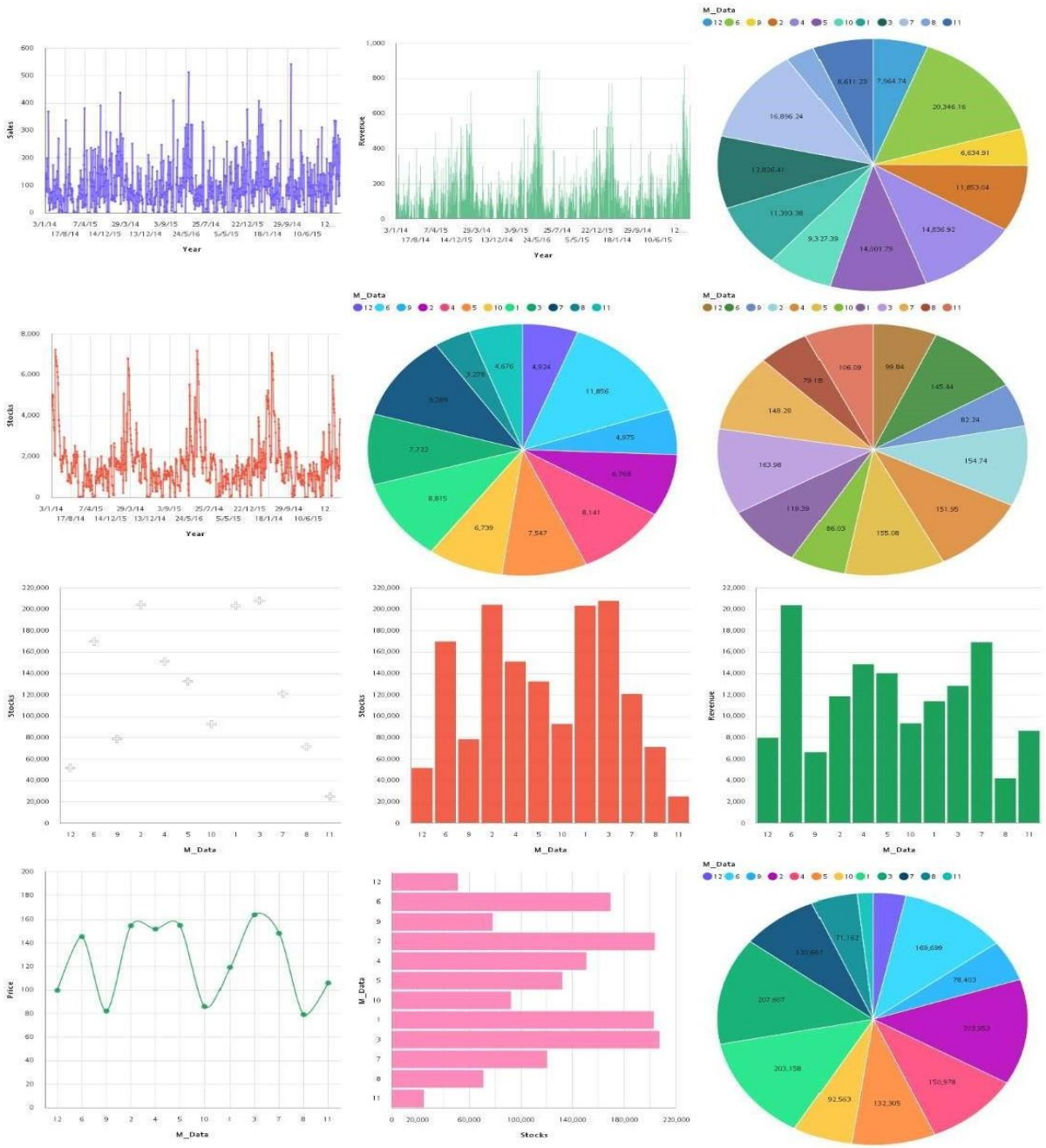


4)Revenue by year:



7.4 DELIVERY OF SPRINT 4

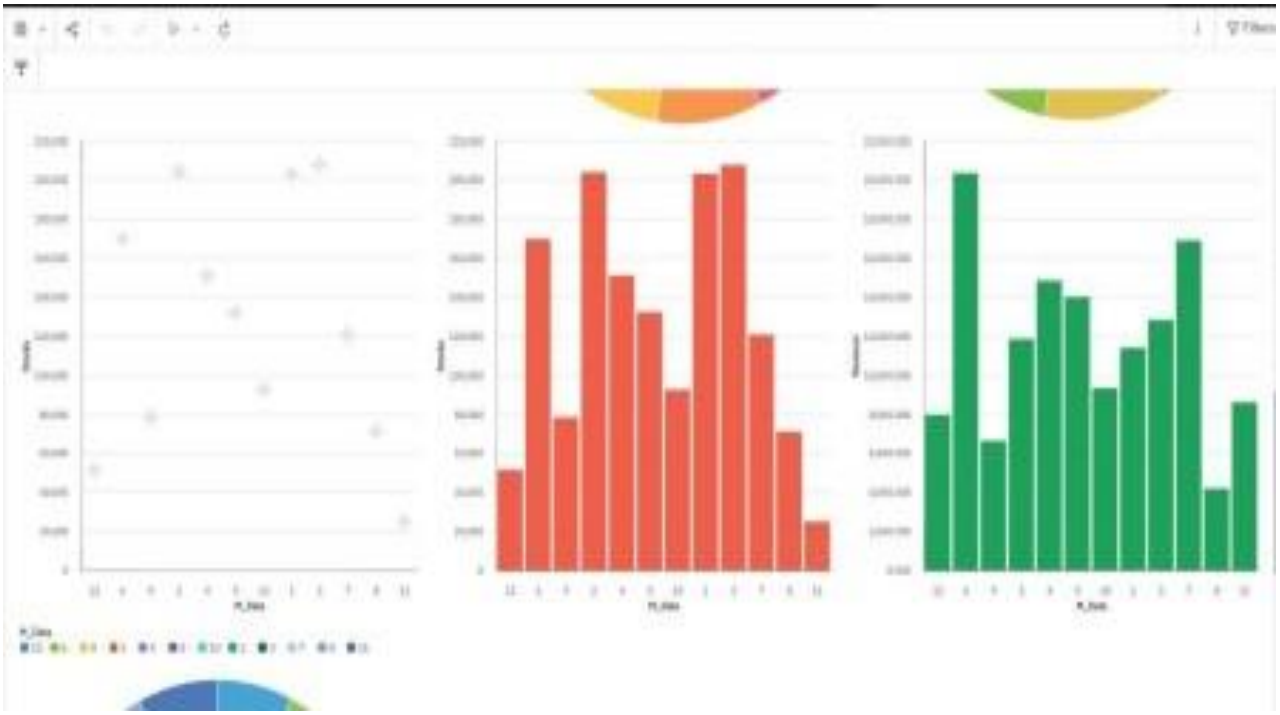
Retail store stock inventory analytics report



Report Creation:

1) SALES BY YEAR, MONTHLY REVENUE, REVENUE BY YEAR

2) MONTHLY SALES



3) MONTHLY STOCKS AND REVENUE

4) MONTHLY PRICE

CONCLUSION

As you can see the importance of inventory management is very serious, it is one of the most important aspects of any business. The aspect of this part of the business is whether or not you can satisfy the demand of your customers if you aren’t sure if you have all the materials availableto make the final product (Thibodeaux, 2014). Without Wheeled Coach©having the proper inventory management they would not be able to supply their customers with their ordered ambulance. And this product is what their entire business is based on, so it is of great importanceWhen they are choosing from the different types of programs or automated systems to help with keeping records accurate, Wheeled Coach©needs to keep in mind that the customer is not concerned with which materials are needed to complete the finished product

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3. Aggarwal, P.K., Moinzadeh, K.: Order expedition in multi-echelon production/distribution systems. IIE Transactions 26(2), 86–96 (1994)
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