

SARANATHAN COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Submitted by

Team ID	PNT2022TMID32631
Project Name	Project – Retail Store Stock Inventory Analytics

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BACHELOR OF ENGINEERING



IBM – Nalaiya Thiran : IBM PROJECT

DECEMBER-2022

PROJECT REPORT DOCUMENTATION

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CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

Retail Store Stock Inventory Analytics is used to analyze stocks, sales, revenue generated in terms of year and month wise. With the help of IBM Cognos tool we have prepared dashboard, report, story, These are helpful while taking business related decisions.

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.

1.2 PURPOSE

Inventory management analysis is used to manage how much inventory is required for selling the products based on which they can calculate the profits and losses.

Our dataset contains a lot of historical sales data of a Brazilian top Retailer.

Basic questions of every Retailer: How much inventory should I carry? Too much inventory means working capital costs, operational costs and a complex operation, lack of inventory leads to lost sales, unhappy customers and a damaged brand.

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

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEMS AND REFERENCES

S.NO	PAPER NAME	DESCRIPTION	AUTHOR	YEAR	REFERENCE
1.	Combination of Advanced Robotics and Computer vision for Shelf Analytics in a Retail Store	A Double Robot used to patrol the store in fixed path and capture images of retail shelves at real time. These images used to address challenges like stock out problem and misplaced products.	Gopichand Agnihotram, Navya Vepakomma, Suyog Trivedi, Sumanta Laha, Nick Isaac s, Srividya Khatravath, Pradeep Naik, Rajesh Kumar.	2017	https://ieeexplore.ieee.org/document/8423894
2.	Development of Smart Sensor Array Mat for Retail Inventory Management	A piezo-resistive sensor mat is used to track the base structure shape of the stock. The sensor mat was used to reduce the mismatching of items caused by human error.	Ruiqi Li m, Musafargani Sikkandhar, Ming-Yuan Cheng.	2022	https://ieeexplore.ieee.org/document/9816441
3.	Towards Intelligent Retail: Automated on-Shelf Availability Estimation Using a Depth Camera	A consumer-grade depth sensor was used to detect out-of-stock situation. The output of the system is used to generate alerts for store managers, as well as to update product availability continuously. No prior knowledge about the product is required.	Annalisa Milella Antonio Petitti , Roberto Marani Grazia Cicirelli, Tiziana D'orazio	2020	https://ieeexplore.ieee.org/document/8963979

4.	Exploiting Egocentric Vision on Shopping Cart for Out-Of-Stock Detection in Retail Environments	A deep learning approach for the detection of Out-Of-Stock (OOS) was developed. A Convolutional Neural Network (CNN) was trained to predict attention maps that are useful to find OOS areas and suggest the retail employers where to intervene. This result in both objective measures and subjective measures.	Dario Allegra, Mattia Litrico, Maria Ausilia Napoli Spatafora, Filippo Stanco, Giovanni Maria Farinella	2021	https://ieeexplore.ieee.org/document/9607839
5.	Store-sales Forecasting Model to Determine Inventory Stock Levels using Machine Learning	The prediction models Random Forest and XGBoost regressor are used to give better accuracy in predicting sales.	Akanksha Akanksha, Devesh Yadav, Deepak Jaiswal, Ashwani Ashwani, Ashutosh Mishra	2022	https://ieeexplore.ieee.org/document/9850468

2.2 NEED FOR THE APPLICATION:

Products are regarded as the company's business resources. This involves handling the product in a proper manner so that it may be reviewed as necessary. The existing method is manual, requiring users to keep ledgers, books, etc. to record data on suppliers, inward shipments, deliveries, and returns of goods. Historical data maintenance is quite challenging. Estimating the need for additional raw materials, dealing with the creation of purchase orders, purchase invoices, sales invoices, and debit notes are some of the crucial business procedures. A group of competent workers who are quick with financial computations and have a good memory do all of these tasks.

2.3 PROBLEM STATEMENT:

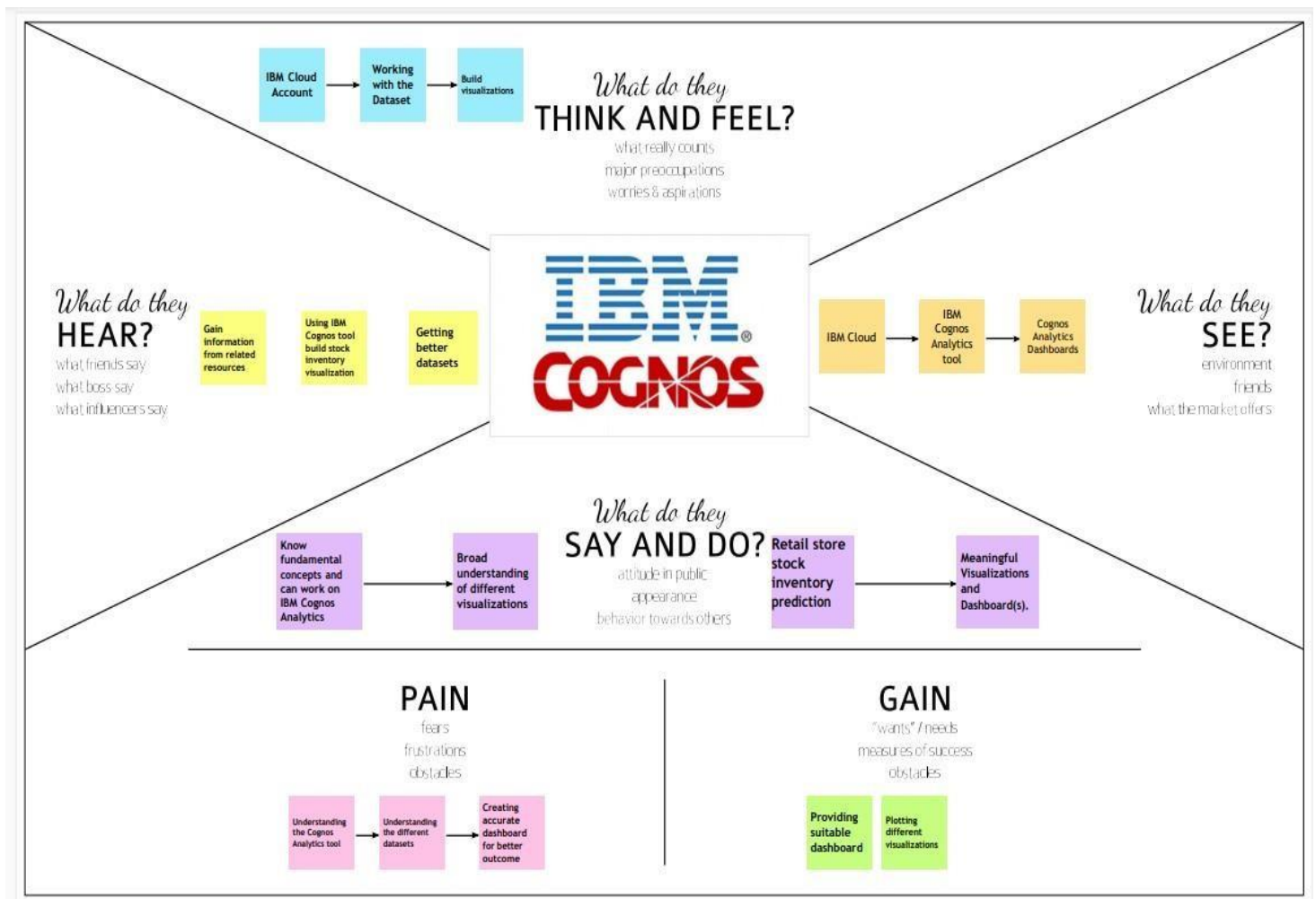
To create an inventory analysis system that will allow retailers to satisfy demand from customers without running out of inventory or holding too much on hand.

CHAPTER 3

IDEATION & PROPOSED SOLUTION


3.1 EMPATHY MAP CANVAS

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to help teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.



3.2 IDEATION & BRAINSTROMING


Template



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

🕒 10 minutes to prepare
🕒 1 hour to collaborate
👤 2-4 people recommended



Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

🕒 10 minutes

A

Team gathering
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.


B

Set the goal
Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools
Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →




Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

🕒 5 minutes


PROBLEM


Retailers who have difficulty in managing inventory always lead to short-term forecasting of the inventory. It leads to overstocking and affects capital, operational costs. By managing inventory, retailers meet customer demand without running out of stock or carrying excess supply. Inventory management is vital for retailers because they increase profits. By preparing various types of charts it is easy to analyse the business and we can make better business decisions.





Key rules of brainstorming

To run a smooth and productive session

 Stay in topic

 Encourage wild ideas

 Defer judgment

 Listen to others

5

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil (switch to pencil) icon to start drawing!

MAHESWARAN.M

Datasets should be uploaded regularly.

The parameters required for analyzing should be viewed updated regularly.

Proper platform, tools and user understandable result set should be used.

KARTHICK.T

The data uploaded by the user can be inaccurate.

The data given by the user can contain inaccuracies.

The equipments used for analytics can be faulty.

BRUNDHA.S

Required data sets for analytics must be provided.

Inaccuracies in the data set can cause issues in prediction.

The predictions can sometimes be inaccurate.

DHANALAKSHMI.M

Not all the details necessary for the analytics will be available on the user's side.

There can be variations in the parameters considered for analyzing day to day stock.

The model may face any issue in analyzing.

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mind.

CATEGORY-1

The data uploaded by the user can be inaccurate.

The data given by the user can contain inaccuracies.

Inaccuracies in the data set can cause issues in prediction.

The predictions can sometimes be inaccurate.

CATEGORY-2

There can be variations in the parameters considered for analyzing day to day stock.

Datasets should be uploaded regularly.

The parameters required for analyzing should be viewed updated regularly.

CATEGORY-3

Proper platform, tools and user understandable result set should be used.

The model may face any issue in analyzing.

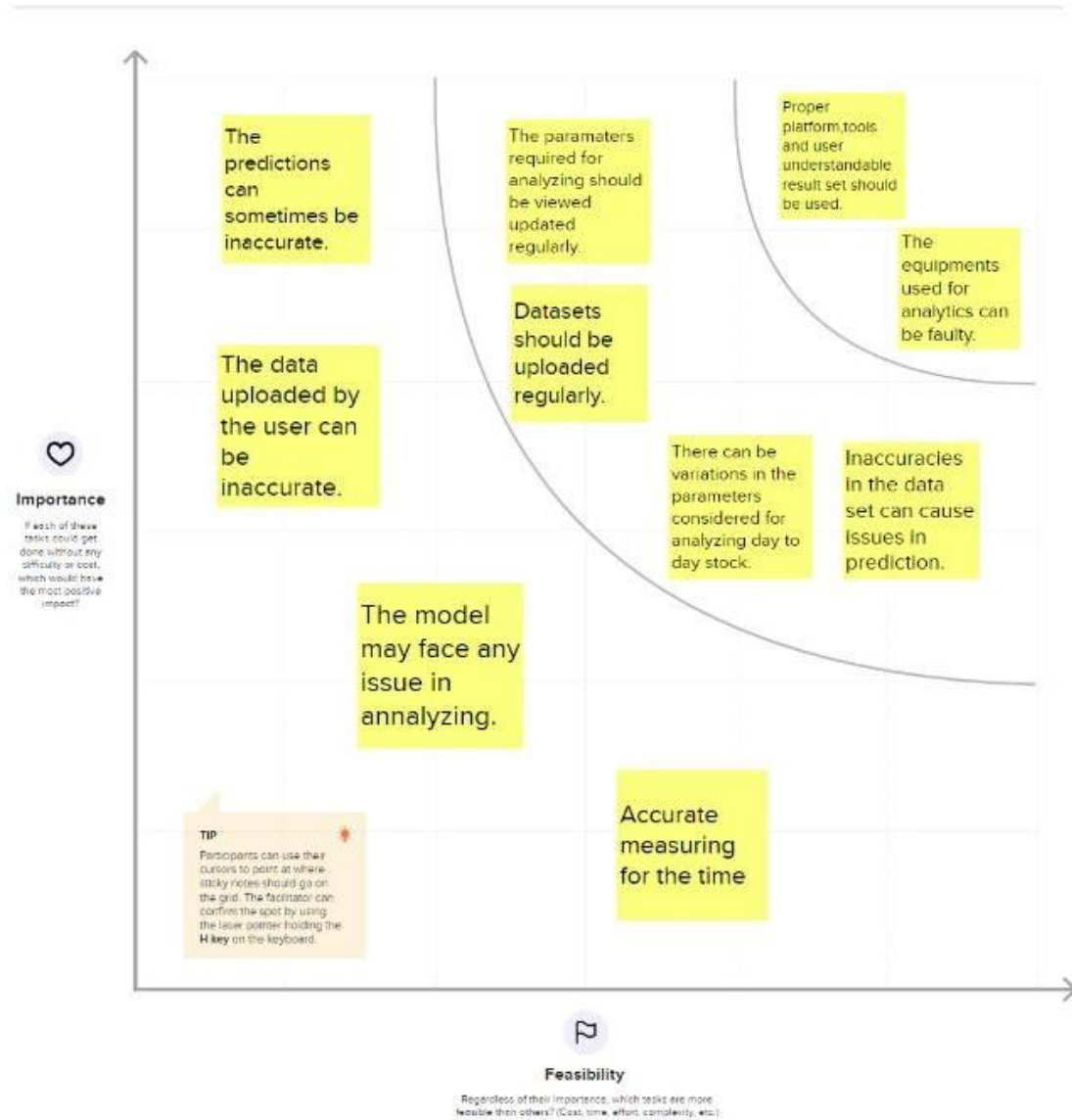
The equipments used for analytics can be faulty.

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



3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Inventory systems, demand is usually uncertain, and the lead-time can also vary. To avoid shortages, retailer often maintain a safety stock. In such situations, it is not clear what order quantities and reorder points will minimize expected total inventory cost.
2.	Idea / Solution description	The right inventory analysis platform can automate processes, improve inventory practices and enhance customer experiences
3.	Novelty / Uniqueness	Track inventory across multiple locations, automatically manage reorder points, forecast demand and plan production and distribution.
4.	Social Impact / Customer Satisfaction	Inventory analysis helps you manage the customer experience when it comes to product returns. An inventory analysis system can track important data concerning returned items and giving you the option to maintain additional inventory levels that mirror your return rates
5.	Business Model (Revenue Model)	Balance demand and supply, integrate financial and operational planning, and link high-level strategic plans

		with mid- and long-term business plans.
6.	Scalability of the Solution	To increase the scalability of your business, you should use an automated inventory analysis system for inventory tracking. This will make your business much more scalable so that you can continue building consistent growth and take advantage of increased sales. An automated inventory analysis system will give your business the structure and real-time metrics it needs to remain competitive and achieve growth goals.

3.4 PROBLEM SOLUTION FIT

<p>1. CUSTOMER SEGMENT(S) CS</p> <p>Retailers who have difficulty in managing inventory always lead to short term forecasting of the inventory. It leads to overstocking and affects capital, operational costs. By managing inventory, retailers meet customer demand without running out of stock or carrying excess supply. Inventory management is vital for retailers because they increase profits.</p>	<p>6. CUSTOMER LIMITATIONS <small>EG. BUDGET, DEVICES</small> CL</p> <p>The analytical projects help in analyzing or managing inventory. Once it is analyzed and the data sets are provided it will perform its work to the fullest. Retailers will feel more comfortable in forecasting inventory without relying on others.</p>	<p>5. AVAILABLE SOLUTIONS <small>PLUSES & MINUSES</small> AS</p> <p>Even though there are more various ways and methods to manage the inventory system, this analysis is more useful. Because the analysis is done on various categories.</p>
<p>2. PROBLEMS / PAINS <small>+ ITS FREQUENCY</small> PR</p> <p>The analytics provides datasets which consist of the details about how much stock is available? Whether it has to be updated is it overstocking? etc. Once the data sets are provided it is easy to make a report of the inventory. The short-term forecasting of the inventory is made simple.</p>	<p>9. PROBLEM ROOT / CAUSE RC</p> <p>The main root cause of this stock inventory management is to maintain stock and to have a clear view in forecasting the inventory. This analytical project surely reduces the percentage of unawareness of the stocks and it helps in forecasting.</p>	<p>7. BEHAVIOR <small>+ ITS INTENSITY</small> BE</p> <p>It tries to make a record of stocks available. It Helps in managing inventory. It is user friendly.</p>
<p>3. TRIGGERS TO ACT TR</p> <p>There are many retailers in different types of retail business industry. Everyone wants to make profits. So, they are triggered to use this type of analysis so they can make better decisions regarding stock inventory system.</p> <p>4. EMOTIONS <small>BEFORE / AFTER</small> EM</p> <p>BEFORE: The shopkeepers with either too little nor too much stock on hand leads to working of capital costs, operational costs, and a complex operation.</p> <p>AFTER: Based on the inventory management analysis we can manage how much inventory is required and we can calculate the profit & losses.</p>	<p>10. YOUR SOLUTION SL</p> <p>By preparing various graphs it is easy to analyze the business and we can make better business decisions. The main objective is to manage the inventory system that is there must not be any excess stock and lack of stock. It can be done very efficiently and effectively.</p>	<p>8. CHANNELS of BEHAVIOR CH</p> <p>OFFLINE: In offline mode it is possible to analyze the inventory system to make sure stocks don't remain excess.</p> <p>ONLINE: It can neither be used in online or either in offline too. It is a double mode operating system which is designed to be user friendly.</p>

CHAPTER 4

REQUIREMENT ANALYSIS

4.1 FUNTIONAL REQUIREMENTS

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration via IBM Cognos Analytics Platform
FR-2	User Confirmation	Confirmation via Email or OTP
FR-3	User Login	Using the registered email ID and password as login credentials
FR-4	Profile	View the profile and change their credentials
FR-5	Dashboard	Output of data based on the chosen different types of visualization
FR-6	Searching	Searching for results and information by stock and profits
FR-7	Visualization	Visualization of data based on stock inventory system available
FR-8	Analysis	Analyzing the charts to make better business decisions
FR-9	Report	User can prepare reports based on the visualization that has been made

4.2 NON-FUNTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Simple user interface where user can navigate through different menu.
NFR-2	Security	User details and login credentials should be safe and secure by suggesting a strong password
NFR-3	Reliability	Portable and cross platform independent Easy to use and flexible
NFR-4	Performance	Response time will be faster. Accuracy of the data and calculation depends on the dataset
NFR-5	Availability	Available 24/7
NFR-6	Scalability	In future we can add additional features related to stock data

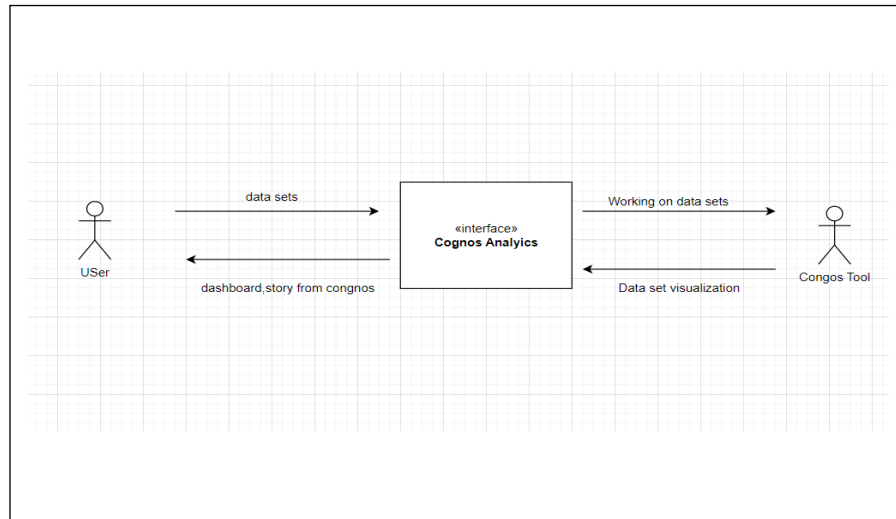
CHAPTER 5

PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION & TECHNICAL ARCHITECTURE



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (PC user)	Registration	USN-1	As a user, I can register for the Cognos by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through IBM id	I can register & access the dashboard with IBM id Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN-6	As a user, I can upload the dataset for visualization	Dataset gets uploaded in Cognos analytics	Medium	Sprint-2
		USN-8	User can choose various types of visualizations from the available options		High	Sprint-2
		USN-9	User can analyze the charts to make better		High	Sprint-3

			business decisions			
		USN-10	User can make use of the visualizations to make reports		Medium	Sprint-3
		USN-11	User can send feedback regarding the platform	Cognos accepts the feedback given by the user	Low	Sprint-4

CHAPTER 6

PROJECT PLANNING & SCHEDULING

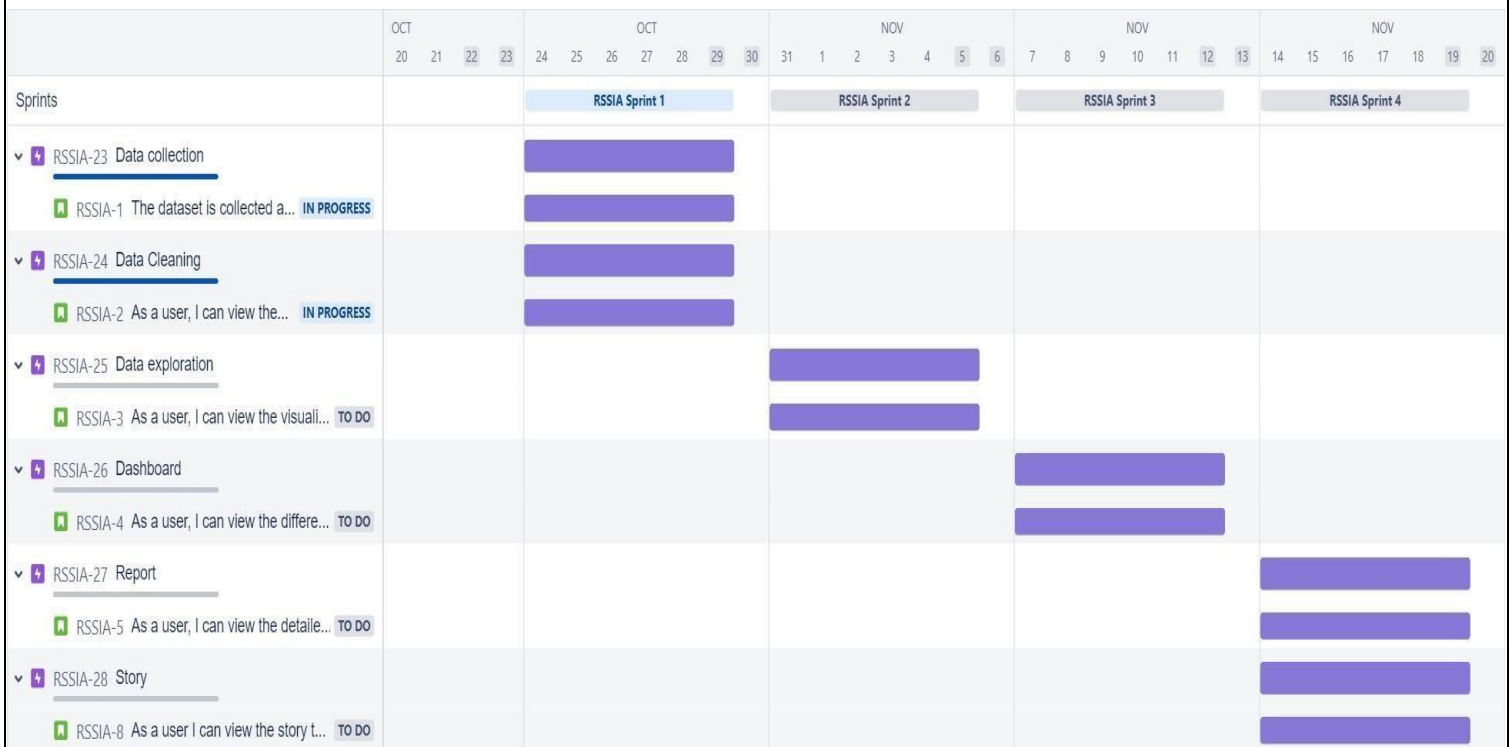
6.1 SPRINT PLANNING & ESTIMATION

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	Maheswaran M Karthick T Brundha S Dhanalakshmi M
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	Maheswaran M Karthick T Brundha S Dhanalakshmi M
Sprint-1	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	Maheswaran M Karthick T Brundha S Dhanalakshmi M
Sprint-2	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	Maheswaran M Karthick T Brundha S Dhanalakshmi M
Sprint-3	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	Maheswaran M Karthick T Brundha S Dhanalakshmi M
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	Maheswaran M Karthick T Brundha S Dhanalakshmi M

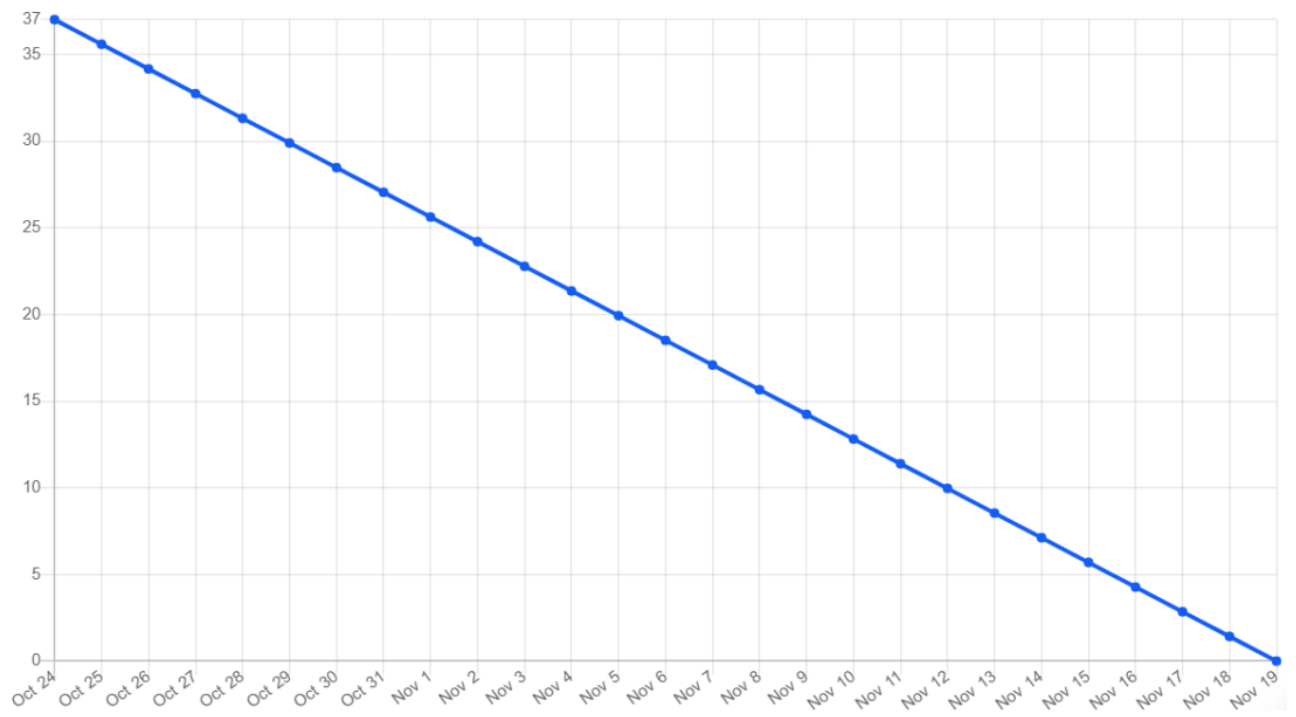
6.2 SPRINT DELIVERY SCHEDULE

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

6.3 REPORTS FROM JIRA



Burndown Chart:



CHAPTER 7

CODING & SOLUTIONS

7.1 FEATURE-1

Web application for Retail Store Stock Inventory Analytics using HTML, CSS, BOOTSTRAP frameworks.

Index.html

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>Retail Store Stock Inventory Analytics</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="assets/img/favicon.png" rel="icon">
  <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Roboto:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="assets/vendor/aos/aos.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
  <link href="assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
  <link href="assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="assets/css/style.css" rel="stylesheet">
```

```

</head>

<body>

  <!-- ===== Header ===== -->
  <header id="header" class="fixed-top ">
    <div class="container d-flex align-items-center justify-content-between">

      <h1 class="logo"><a href="index.html">Retail Store</a></h1>
      <!-- Uncomment below if you prefer to use an image logo -->
      <!-- <a href="index.html" class="logo"></a>-->

      <nav id="navbar" class="navbar">
        <ul>
          <li><a class="nav-link scrollto active" href="#hero">Home</a></li>
          <li><a class="nav-link scrollto" href="#about">About</a></li>
          <li><a class="nav-link scrollto" href="#services">Dashboard</a></li>
          <li><a class="nav-link scrollto " href="#portfolio">Report</a></li>
          <li><a class="nav-link scrollto " href="#pricing">Story</a></li>

        </ul>
        <i class="bi bi-list mobile-nav-toggle"></i>
      </nav><!-- .navbar -->

    </div>
  </header><!-- End Header -->

  <!-- ===== Hero Section ===== -->
  <section id="hero" class="d-flex align-items-center">

    <div class="container-fluid" data-aos="fade-up">
      <div class="row justify-content-center">
        <div class="col-xl-5 col-lg-6 pt-3 pt-lg-0 order-2 order-lg-1 d-flex flex-
column justify-content-center">
          <h1>Better Business Decisions</h1>

          <div><a href="#about" class="btn-get-started scrollto">Get Started</a></div>
        </div>
        <div class="col-xl-4 col-lg-6 order-1 order-lg-2 hero-img" data-aos="zoom-in"
data-aos-delay="150">
          
        </div>
      </div>
    </div>
  </section>

```

```

</div>

</section><!-- End Hero -->

<main id="main">

  <!-- ===== About Section ===== -->
  <section id="about" class="about">
    <div class="container">

      <div class="row">
        <div class="col-lg-6 order-1 order-lg-2" data-aos="zoom-in" data-aos-
delay="150">
          
        </div>
        <div class="col-lg-6 pt-4 pt-lg-0 order-2 order-lg-1 content" data-
aos="fade-right">
          <h3>Retail Store Stock Inventory Analytics</h3>
          <p class="fst-italic">
            By using this tool meaningful insights can be obtained and better
business decisions can be taken.
          </p>
          <ul>
            <li><i class="bi bi-check-circle"></i> This dataset contains a lot of
historical sales data of a Brazilian top retailer</li>
            <li><i class="bi bi-check-circle"></i> 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.</li>
            <li><i class="bi bi-check-circle"></i> This is why short-term
forecasting is so important in the retail and consumer goods industry.</li>
          </ul>
          <a href="#" class="read-more">Read More <i class="bi bi-long-arrow-
right"></i></a>
        </div>
      </div>
    </div>

  </div>
</section><!-- End About Section -->

  <!-- ===== Services Section ===== -->
  <section id="services" class="services section-bg">
    <div class="container" data-aos="fade-up">

      <div class="section-title">

```

```

        <h2>Dashboard</h2>
        <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.public_folders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FRetail%2BDashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model000001848621759a_00000002"
width="1300" height="1000" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
        </div>

    </div>

</div>
</section><!-- End Services Section -->


<!-- ===== Portfolio Section ===== -->
<section id="portfolio" class="portfolio">
    <div class="container" data-aos="fade-up">

        <div class="section-title">
            <h2>Report</h2>
            <iframe
src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.public_folders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FRetail%2BReport&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="1300" height="1000" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
            </div>

        </div>

    </div>
</section><!-- End Portfolio Section -->


<!-- ===== Pricing Section ===== -->
<section id="pricing" class="pricing section-bg">
    <div class="container" data-aos="fade-up">

        <div class="section-title">

```

```

        <h2>Story</h2>
        <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.public_folders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FStory%253A%2BRetail&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=-1&sceneTime=0" width="1300" height="1000" frameborder="0"
gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
    </div>

</div>

</div>
</section><!-- End Pricing Section -->

<!-- ===== Frequently Asked Questions Section ===== -->
<section id="faq" class="faq">
    <div class="container" data-aos="fade-up">

        <div class="section-title">
            <h2>Frequently Asked Questions</h2>
        </div>

        <div class="faq-list">
            <ul>
                <li data-aos="fade-up" data-aos-delay="100">
                    <i class="bx bx-help-circle icon-help"></i> <a data-bs-toggle="collapse" class="collapse" data-bs-target="#faq-list-1">Is the web application free?<i class="bx bx-chevron-down icon-show"></i><i class="bx bx-chevron-up icon-close"></i></a>
                    <div id="faq-list-1" class="collapse show" data-bs-parent=".faq-list">
                        <p>
                            As of now we use IBM Cognos Analytics Students Free trial version.
                            So, it is free to use.
                        </p>
                    </div>
                </li>

                <li data-aos="fade-up" data-aos-delay="200">
                    <i class="bx bx-help-circle icon-help"></i> <a data-bs-toggle="collapse" data-bs-target="#faq-list-2" class="collapsed">Which database has been used? <i class="bx bx-chevron-down icon-show"></i><i class="bx bx-chevron-up icon-close"></i></a>
                    <div id="faq-list-2" class="collapse" data-bs-parent=".faq-list">
                        <p>

```



```

        IBM DB2 has been used to fetch data for Dashboard, Report, Story.
    </p>
</div>
</li>

<li data-aos="fade-up" data-aos-delay="300">
    <i class="bx bx-help-circle icon-help"></i> <a data-bs-toggle="collapse"
data-bs-target="#faq-list-3" class="collapsed">Does the Cognos tool available 24*7? <i
class="bx bx-chevron-down icon-show"></i><i class="bx bx-chevron-up icon-
close"></i></a>
    <div id="faq-list-3" class="collapse" data-bs-parent=".faq-list">
        <p>
            Yes. The Cognos tool is available 24*7.
        </p>
    </div>
</li>

</ul>
</div>

</div>
</section><!-- End Frequently Asked Questions Section -->

</main><!-- End #main -->

<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i
class="bi bi-arrow-up-short"></i></a>
<div id="preloader"></div>

<!-- Vendor JS Files -->
<script src="assets/vendor/purecounter/purecounter_vanilla.js"></script>
<script src="assets/vendor/aos/aos.js"></script>
<script src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
<script src="assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
<script src="assets/vendor/php-email-form/validate.js"></script>

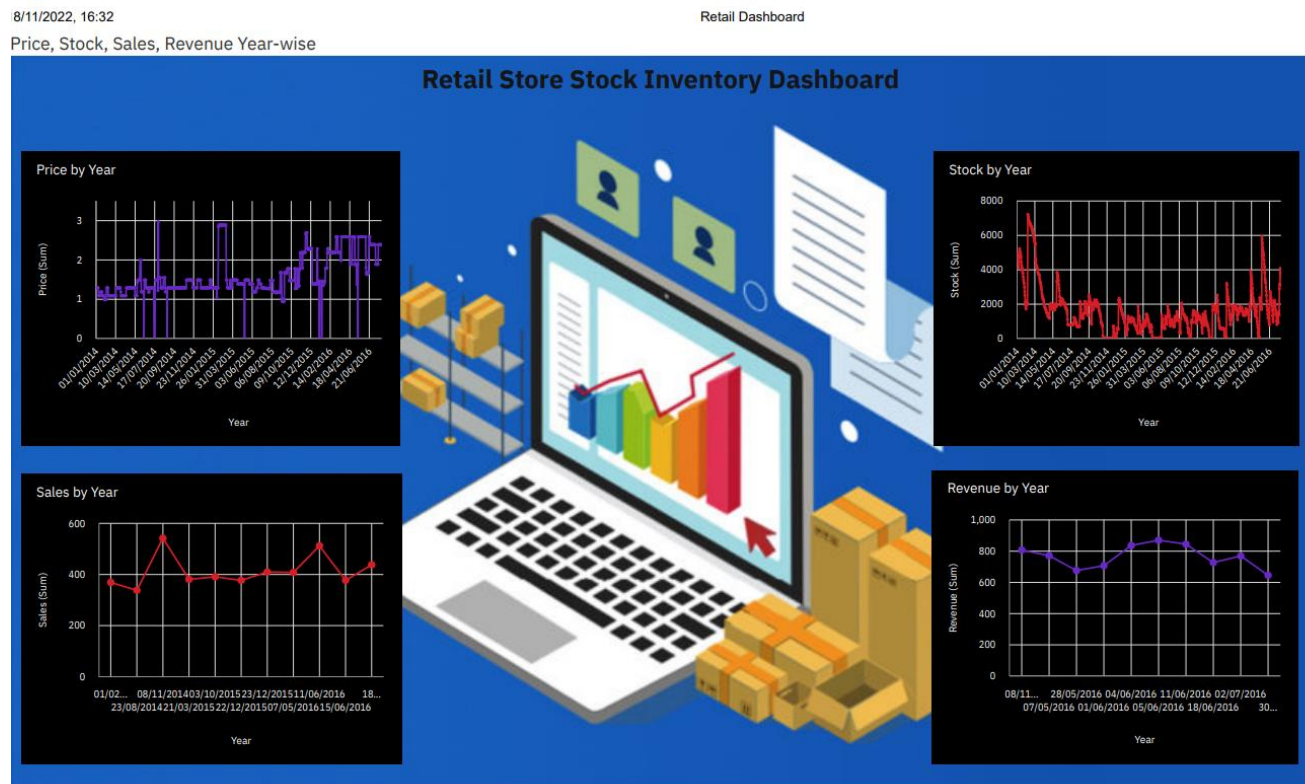
<!-- Template Main JS File -->
<script src="assets/js/main.js"></script></body></html>

```

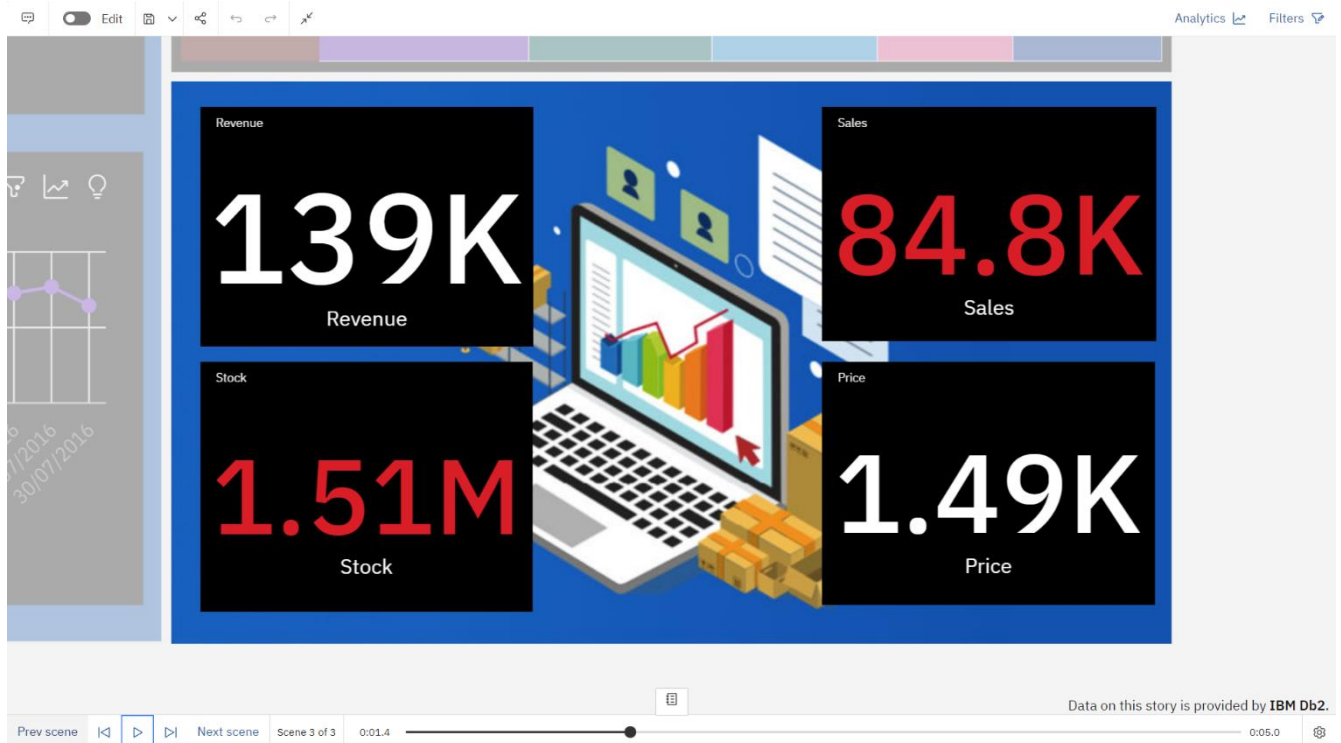
7.2 FEATURE 2

IBM Cognos Tool is used to make dashboards, reports, stories. With the help of them effective business decisions can be made.

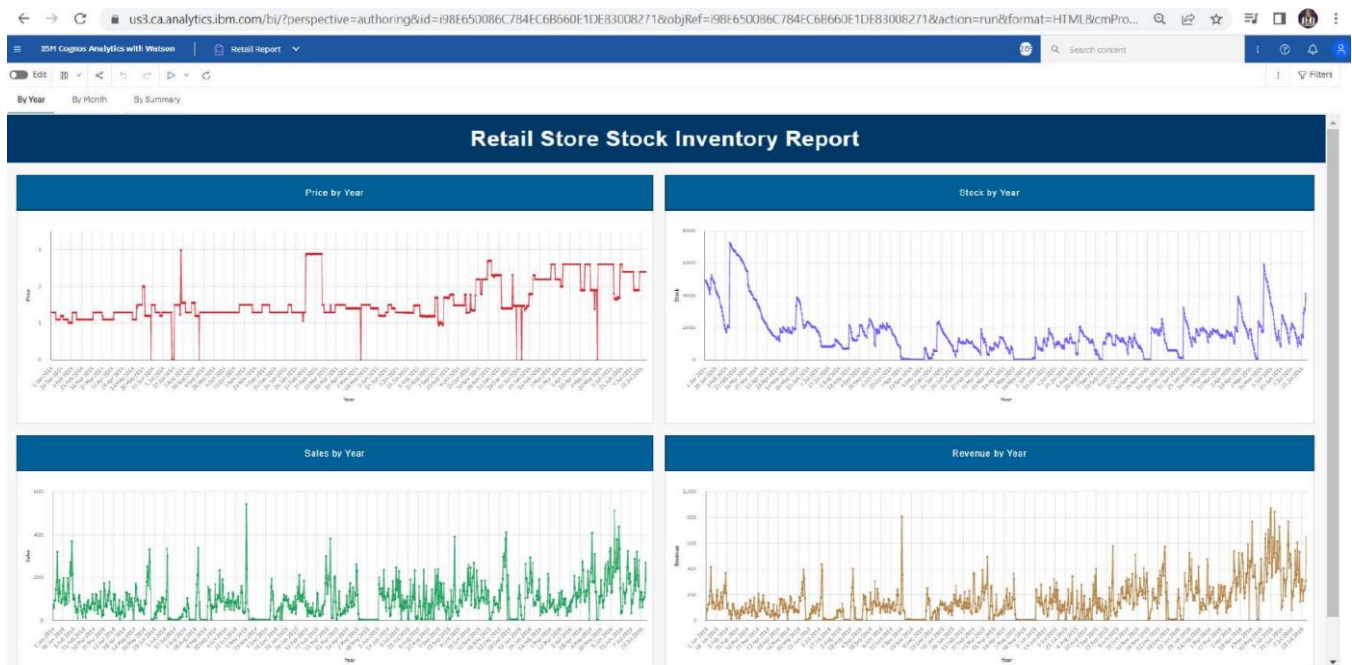
DASHBOARD-



STORY-



REPORT-



7.3 DATABASE

← → ↻ bpe61bfd0365e9u4psdglite.db2.cloud.ibm.com/crn%3Av1%3Abluemix%3Apublic%3Adashdb-for-transactions%3Aus-south%3Aa%2F057572df1b90430384fb8700730967e2%3A217dc4e1-7541-41... ⌵ ⭐ 🏠 👤

IBM Db2 on Cloud 🔔 👤

⌵ Load Data Load History **Tables** Views Indexes Aliases MQTs Sequences Application objects

🔍 Find schemas or tables Refresh ↻

SQL

🔗

📄

🔗

📄

💡

Schemas

<input checked="" type="checkbox"/>	Name	Type	Tables ▲
<input checked="" type="checkbox"/>	QNJ48093	User	1

Total: 1, selected: 1

Tables

New table + 🔍 ⌵ ⌵ ×

<input type="checkbox"/>	Name ▼	Schema	Properties
<input type="checkbox"/>	RETAIL	QNJ48093	...

Total: 1, selected: 0

← → ↻ bpe61bfd0365e9u4psdglite.db2.cloud.ibm.com/crn%3Av1%3Abluemix%3Apublic%3Adashdb-for-transactions%3Aus-south%3Aa%2F057572df1b90430384fb8700730967e2%3A217dc4e1-7541-41... ⌵ ⭐ 🏠 👤

IBM Db2 on Cloud 🔔 👤

⌵ Load Data Load History **Tables** Views Indexes Aliases MQTs Sequences Application objects

🔍 Find schemas or tables Refresh ↻

SQL

🔗

📄

🔗

📄

💡

Schemas

Tables

New table + 🔍 ⌵ ⌵ ×

<input type="checkbox"/>	Name ▼	Schema	Properties
<input type="checkbox"/>	RETAIL	QNJ48093	...

Total: 1, selected: 0

Table definition

⌵ ×

RETAIL

No statistics available

Name	Data type	Nullable	Length	Scale	
DATA	DATE	Y	4	0	👁
VENDA	SMALLINT	Y		0	👁
ESTOQUE	SMALLINT	Y		0	👁
PRECO	DECIMAL	Y	5	2	👁

View data

CHAPTER 8

TESTING

8.1 TEST CASES

S.No	Input	Expected output	Actual Output
1	Verify User's IBM Cognos Credentials and if they are correct.	Logged in.	Logged in.
2	Verify User's IBM Cognos Credentials and if they are not correct.	Not logged in.	Not logged in.
3	Display Visualizations for uploaded dataset.	Visualizations provided.	Visualizations provided.

8.2 USER ACCEPTANCE TESTING

1. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	8	4	2	1	15
Duplicate	0	0	0	0	0
External	3	2	0	1	6
Fixed	4	0	1	1	6
Not Reproduced	0	0	1	0	1
Skipped	0	0	0	1	1
Won't Fix	0	0	1	0	1
Totals	15	6	5	4	30

2. Test Case Analysis - This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	6	0	0	6
Client Application	25	0	0	25
Security	4	0	0	4
Outsource Shipping	5	0	0	4
Exception Reporting	6	0	0	6
Final Report Output	8	0	0	8
Version Control	4	0	0	4

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICS

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	Dashboard consist of 8 graphs in 3 different tabs.
2.	Data Responsiveness	Data was responsive for creating dashboard, story and report.
3.	Amount Data to Rendered (DB2 Metrics)	Inventory management dataset which consists of 937 data in it.
4.	Utilization of DataFilters	Data filters was used to find the top most of the data in formof visualization.
5.	Effective User Story	Story consists of 3 scenes and 8 graphs.
6.	Descriptive Reports	Created 3 reports with 8 graphs.

CHAPTER 10

ADVANTAGES & DISADVANTAGES

ADVANTAGES-

- It reduces manual labor.
- It helps to predict the demands.
- The correct prediction of demand leads to avoidance of dead stock and helps with the shortages of the stock.

DISADVANTAGES-

- If there occurs any error in prediction it causes losses.
- Higher storage and insurance costs.
- Overstocking on products runs the risk of the product becoming obsolete.

CHAPTER 11

CONCLUSION

The project “Retail Store Stock Inventory Analytics” was developed to satisfy the retailer or ecommerce customer and in order to maintain the stock at the demand level. It helps to overcome the crisis like overflow of stock or dead stock or with nearly expiring items. This analytics helps in prediction, so using prediction the shortage of the stock can’t be happen. Since the project is done as web app, it helps to meet with the need of labor for maintaining the inventory. Hence in Retail store stock analysis it helps shop holder to manage stock, sale and price and maintain the necessary stock without reaching to demand, by maintaining the stock it gains the trust for the customer to buy product on a regular basis which also provide gain to to shop holder by increasing the profit.

CHAPTER 12

FUTURE SCOPE

Inventory management systems have become more real-time, giving retailers more data about demographics, spending habits, shopping preferences, etc. Stock control for omni channel retailing. Stores doing omni channel retailing are at the top of their game; they attract the 90% of consumers who switch between at least three applications per day to complete specific tasks. Inventories that power experiential retail.

As of now the web application created has only front-end part and we will be extending it with back-end. The app doesn't have login and registration page. It will also be created soon.

CHAPTER 13

APPENDIX

SOURCE CODE-

Index.html

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>Retail Store Stock Inventory Analytics</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="assets/img/favicon.png" rel="icon">
  <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Roboto:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="assets/vendor/aos/aos.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
  <link href="assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
  <link href="assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="assets/css/style.css" rel="stylesheet">

</head>

<body>

  <!-- ===== Header ===== -->
  <header id="header" class="fixed-top ">
```

```

<div class="container d-flex align-items-center justify-content-between">

<h1 class="logo"><a href="index.html">Retail Store</a></h1>
  <!-- Uncomment below if you prefer to use an image logo -->
  <!-- <a href="index.html" class="logo"></a>-->

  <nav id="navbar" class="navbar">
    <ul>
      <li><a class="nav-link scrollto active" href="#hero">Home</a></li>
      <li><a class="nav-link scrollto" href="#about">About</a></li>
      <li><a class="nav-link scrollto" href="#services">Dashboard</a></li>
      <li><a class="nav-link scrollto" href="#portfolio">Report</a></li>
      <li><a class="nav-link scrollto" href="#pricing">Story</a></li>

    </ul>
    <i class="bi bi-list mobile-nav-toggle"></i>
  </nav><!-- .navbar -->

</div>
</header><!-- End Header -->

<!-- ===== Hero Section ===== -->
<section id="hero" class="d-flex align-items-center">

  <div class="container-fluid" data-aos="fade-up">
    <div class="row justify-content-center">
      <div class="col-xl-5 col-lg-6 pt-3 pt-lg-0 order-2 order-lg-1 d-flex flex-
column justify-content-center">
        <h1>Bettter Business Decisions</h1>

        <div><a href="#about" class="btn-get-started scrollto">Get Started</a></div>
      </div>
      <div class="col-xl-4 col-lg-6 order-1 order-lg-2 hero-img" data-aos="zoom-in"
data-aos-delay="150">
        
      </div>
    </div>
  </div>

</section><!-- End Hero -->

<main id="main">

```

```

<!-- ===== About Section ===== -->
<section id="about" class="about">
  <div class="container">

    <div class="row">
      <div class="col-lg-6 order-1 order-lg-2" data-aos="zoom-in" data-aos-
delay="150">
        
      </div>
      <div class="col-lg-6 pt-4 pt-lg-0 order-2 order-lg-1 content" data-
aos="fade-right">
        <h3>Retail Store Stock Inventory Analytics</h3>
        <p class="fst-italic">
          By using this tool meaningful insights can be obtained and better
business decisions can be taken.
        </p>
        <ul>
          <li><i class="bi bi-check-circle"></i> This dataset contains a lot of
historical sales data of a Brazilian top retailer</li>
          <li><i class="bi bi-check-circle"></i> 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.</li>
          <li><i class="bi bi-check-circle"></i> This is why short-term
forecasting is so important in the retail and consumer goods industry.</li>
        </ul>
        <a href="#" class="read-more">Read More <i class="bi bi-long-arrow-
right"></i></a>
      </div>
    </div>
  </section><!-- End About Section -->

  <!-- ===== Services Section ===== -->
  <section id="services" class="services section-bg">
    <div class="container" data-aos="fade-up">

      <div class="section-title">
        <h2>Dashboard</h2>
        <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.public_fo
lders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FRetail%2BDashboard&closeW
indowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&am
p;action=view&mode=dashboard&subView=model000001848621759a_00000002"

```

```

width="1300" height="1000" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
    </div>

</div>

</div>
</section><!-- End Services Section -->


<!-- ===== Portfolio Section ===== -->
<section id="portfolio" class="portfolio">
    <div class="container" data-aos="fade-up">

        <div class="section-title">
            <h2>Report</h2>
            <iframe
src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.public_folders%2FRetail%2BStore%2BS
tock%2BInventory%2BAnalytics%2FRetail%2BReport&amp;closeWindowOnLastView=true&amp;ui_a
ppbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=run&amp;format=HTML&
&amp;prompt=false" width="1300" height="1000" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>
        </div>

    </div>

</div>

</section><!-- End Portfolio Section -->


<!-- ===== Pricing Section ===== -->
<section id="pricing" class="pricing section-bg">
    <div class="container" data-aos="fade-up">

        <div class="section-title">
            <h2>Story</h2>
            <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&amp;pathRef=.public_folder
s%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FStory%253A%2BRetail&amp;closeWind
owOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;a

```

```

ction=view&sceneId=-1&sceneTime=0" width="1300" height="1000" frameborder="0"
gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
</div>

</div>

</div>
</section><!-- End Pricing Section -->

<!-- ===== Frequently Asked Questions Section ===== -->
<section id="faq" class="faq">
  <div class="container" data-aos="fade-up">

    <div class="section-title">
      <h2>Frequently Asked Questions</h2>

    </div>

    <div class="faq-list">
      <ul>
        <li data-aos="fade-up" data-aos-delay="100">
          <i class="bx bx-help-circle icon-help"></i> <a data-bs-toggle="collapse"
class="collapse" data-bs-target="#faq-list-1">Is the web application free?<i class="bx
bx-chevron-down icon-show"></i><i class="bx bx-chevron-up icon-close"></i></a>
          <div id="faq-list-1" class="collapse show" data-bs-parent=".faq-list">
            <p>
              As of now we use IBM Cognos Analytics Students Free trial version.
              So, it is free to use.
            </p>
          </div>
        </li>

        <li data-aos="fade-up" data-aos-delay="200">
          <i class="bx bx-help-circle icon-help"></i> <a data-bs-toggle="collapse"
data-bs-target="#faq-list-2" class="collapsed">Which database has been used? <i
class="bx bx-chevron-down icon-show"></i><i class="bx bx-chevron-up icon-
close"></i></a>
          <div id="faq-list-2" class="collapse" data-bs-parent=".faq-list">
            <p>
              IBM DB2 has been used to fetch data for Dashboard, Report, Story.
            </p>
          </div>
        </li>
      </ul>
    </div>
  </div>

```

```

        <li data-aos="fade-up" data-aos-delay="300">
            <i class="bx bx-help-circle icon-help"></i> <a data-bs-toggle="collapse"
data-bs-target="#faq-list-3" class="collapsed">Does the Cognos tool available 24*7? <i
class="bx bx-chevron-down icon-show"></i><i class="bx bx-chevron-up icon-
close"></i></a>
            <div id="faq-list-3" class="collapse" data-bs-parent=".faq-list">
                <p>
                    Yes. The Cognos tool is available 24*7.
                </p>
            </div>
        </li>

    </ul>
</div>

</div>
</section><!-- End Frequently Asked Questions Section -->

</main><!-- End #main -->

<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i
class="bi bi-arrow-up-short"></i></a>
<div id="preloader"></div>

<!-- Vendor JS Files -->
<script src="assets/vendor/purecounter/purecounter_vanilla.js"></script>
<script src="assets/vendor/aos/aos.js"></script>
<script src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
<script src="assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
<script src="assets/vendor/php-email-form/validate.js"></script>

<!-- Template Main JS File -->
<script src="assets/js/main.js"></script>

</body>

</html>

```


DASHBOARD LINK-

https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.public_folders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FRetail%2BDashboard&action=view&mode=dashboard&subView=model000001848621759a_00000002

REPORT LINK-

https://us3.ca.analytics.ibm.com/bi/?pathRef=.public_folders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FRetail%2BReport&action=run&format=HTML&prompt=false

STORY LINK-

https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.public_folders%2FRetail%2BStore%2BStock%2BInventory%2BAnalytics%2FStory%253A%2BRetail&action=view&sceneId=-1&sceneTime=0

GITHUB LINK-

<https://github.com/IBM-EPBL/IBM-Project-15740-1659603856>

DEMO LINK-

https://drive.google.com/file/d/1CiP2dARigKC_3l5yVFg-SfqqFYojNGmV/view?usp=sharing