**PROJECT REPORT**

# INVENTORY MANAGEMENT SYSTEM FOR RETAILERS


**submitted by**

**PNT2022TMID04841**

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Pradeev S - 737819ITR060

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# CHAPTER 1
# INTRODUCTION

## a. PROJECT OVERVIEW

More specifically, a cloud application is software that runs its processing logic and data storage between 2 different systems: client-side and server-side. Some processing takes place on an end user's local hardware, such as a desktop or mobile device, and some takes place on a remote server.

Retail inventory management is the process of ensuring you carry merchandise 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.

## b. PURPOSE

In practice, effective retail inventory management results in lower costs and a better understanding of sales patterns. Retail inventory management tools and methods give retailers more information on which to run their businesses. Applications have been developed to help retailers track and manage stocks related to their own products. The System will ask retailers to create their accounts by providing essential details. Retailers can access their accounts by logging into the application.

# CHAPTER 2

# LITERATURE SURVEY

## a. EXISTING PROBLEM

The problem statement intends to create a desktop application for retailers that will track all aspects of IMS such as purchase details, sales details, and stock management. The application provides the retailer with detailed information about the products in their inventory, and the ability to manage them more effectively.

The inventory management system operates by connecting the Point - of – sale system's database and the application's database. When a specific product is purchased, the product's availability in the database decreases accordingly. When the quality of a product falls below a certain threshold value, the application automatically contacts the supplier for a new order. The user must specify the threshold value. The application also informs the user of the products' expiration date. The user also receives an indication of the products ordered, which they can track, and the application can make automatic payments for each supply purchase.

## b. REFERENCES

**1)**

**PAPER :** Inventory management for retail companies: A literature review and current trends

**AUTHOR :** Cinthya Vanessa Munoz Macas,

Jorge Andres Espinoza Aguirre,

Rodrigo Arcentales-Carrion,

Mario Pena

**YEAR :** 2021

**DESCRIPTION :**

To analyze and present an extensive literature concerning inventory management, containing multiple definitions and fundamental concepts for the retail sector. The primary outcomes of this study are the leading inventory management systems and models, the

Key Performance Indicators (KPIs) for their correct management, and the benefits and challenges for choosing or adopting an efficient inventory control and management system.

**FUTURE WORK AND ANALYSIS :**

To reduce the cost and maintenance and make available for all the companies.The need to analyze their KPIs becomes highly significant, as well as their different systems, methodologies, and tools used within inventory management and optimization.

**2)PAPER :** Retail inventory management with stock-out based dynamic demand substitution

**AUTHOR :** Baris Tan

Selcuk Karabati

**YEAR :** 2013

**DESCRIPTION :** To study an inventory management problem in a retail setting with stock-out based substitutions and multiple items in a product category and propose an approximate solution to determine the order-up-to levels to maximize the expected profit subject to service level constraints. The method uses demand parameters including the substitution probabilities estimated from the point-of-sales data. The method provides a practical tool for retailers to manage their inventory.

**FUTURE WORK AND ANALYSIS :**Through a computational study, by explicitly accounting for substitutions, the performance of the inventory system can be improved. The amount of improvement depends on the minimum direct service level requirement as well as the correlation between the market share and the profit margin of the products. By combining the method we presented in an earlier study to estimate the demand and customer choice parameters, the method we presented in this study can be used to manage inventory in a better way in retailing.

**3)PAPER :** Robust inventory management with stock-out substitution

**AUTHOR :** Zhaolin Li

Grace Fu

**YEAR :** 2017

**DESCRIPTION :** Stock-out substitution is a well-documented phenomenon that occurs

when customers seek a different product as a substitute for their first-choice item if it runs out of stock. We consider a single-period inventory model with limited information regarding the external demands (i.e., mean, variance, and covariance) and focus on identifying the inventory levels that maximize the worst-case expected profit. We formulate a two-stage optimization model: the second stage characterizes the worst-case joint demand distribution by treating the inventory levels as input parameters, and the first stage identifies the optimal inventory levels based on the results of the second stage.

**FUTURE WORK AND ANALYSIS :** Our approach makes use of the limited information on product demands and is suitable for the circumstance in which exact demand distributions can not be accurately estimated. After formulating the optimization model as a two-stage model, we find that the closed-form solution of the second stage is intractable except for two special cases. We develop a heuristic solution based on these two special cases. An extensive numerical study indicates that the performance of the heuristic solution is nearly optimal over a wide range of parameters. Investigating the effects of robust decision rule changes could offer interesting future research

**4)PAPER :** Managing demand uncertainty:Probabilistic selling versus inventory substitution

**AUTHOR :** Yi Zhang

Guowei Hua

Shoyang Wang

Juliang Zhang

Vicenc Fernandez

**YEAR :** 2018

**DESCRIPTION :** To combat demand uncertainty, both strategies of inventory substitution and probabilistic selling can be used. Although the two strategies differ in operation, we believe that they share a common feature in combating demand uncertainty by encouraging some customers to give up some specific demand for the product to enable demand substitution. It is interesting to explore which strategy is more advantageous to the retailer.

**FUTURE WORK AND ANALYSIS :** inventory substitution is the better choice for the retailer when the product similarity is higher.The price of the probabilistic product is an exogenous variable. Future research may extend our work by combining the pricing and inventory decisions. It is also worth considering PS in a supply chain setting. For example, it

is interesting to explore the conditions under which a retailer's probabilistic selling will benefit the supplier, the retailer, and both.

**5)PAPER :** A joint model for cash and inventory management for a retailer under delay in payments

**AUTHOR :** Lama Moussawi-Haidar

Mohamad Y. Jaber

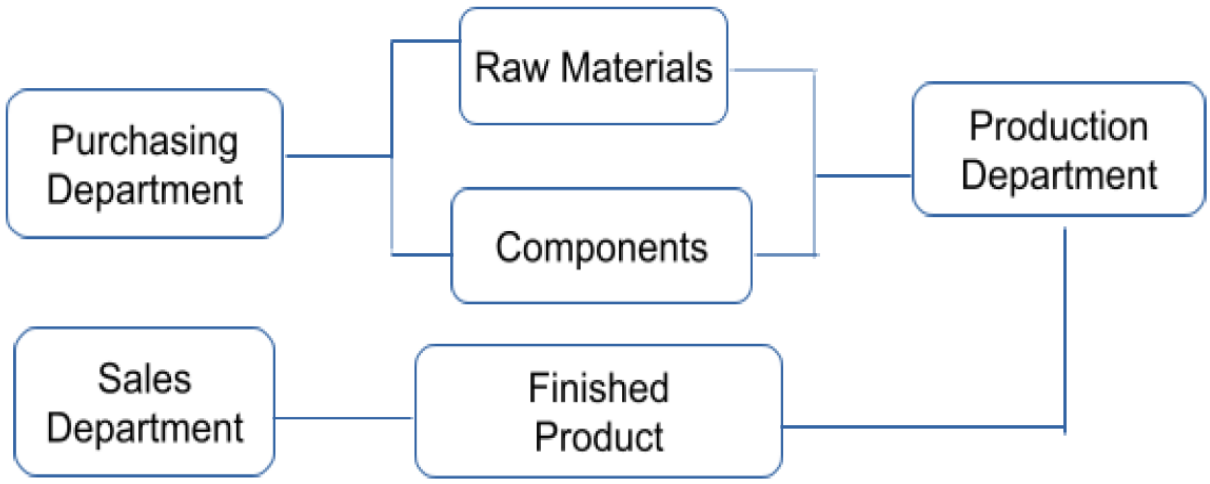
**YEAR :** 2013

**DESCRIPTION :** The problem of finding the optimal operational (how much to order and when to pay the supplier) and financial decisions (maximum cash level and loan amount) by integrating the cash management and inventory lot sizing problems.As retail companies continue to navigate through the economy downturn, it becomes critical to find innovative cost reduction methods. Cash management is a cost-intensive process for retailers, who are currently focusing on effective cash management, such as deciding on the maximum cash level to keep in their business accounts and how much to borrow to finance inventories and pay suppliers.

**FUTURE WORK AND ANALYSIS :**Results indicate that as the percentage margin increases, the order quantity and maximum cash level increase for a given credit period, and that they both increase with the credit period. Increasing the holding and storage cost, the order quantity and cash level decrease given the retailer’s return on cash. Further research should be done in the credit period to show that the cash management model reduces the retailer’s cost.

## C. PROBLEM STATEMENT DEFINITION

Retail inventory management is the process of ensuring you carry merchandise 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. The problem statement intends to create a desktop application for retailers that will track all aspects of IMS such as purchase details, sales details, and stock management. The application provides the retailer with detailed information about the products in their inventory, and the ability to manage them more effectively.




The inventory management system operates by connecting the Point - of – sale system's database and the application's database. When a specific product ispurchased, the product's availability in the database decreases accordingly. When the quality of a product falls below a certain threshold value, the application automatically contacts the supplier for a new order. The user must specify the threshold value. The application also informs the user of the products' expiration date. The user also receives an indication of the products ordered, which they can track, and the application can make automatic payments for each supply purchase.

# CHAPTER 3

## IDEATION AND PROPOSEDSOLUTION

### a. EMPATHY MAP CANVAS


### b. IDEATION & BRAINSTORMING

## 2 Brainstorm

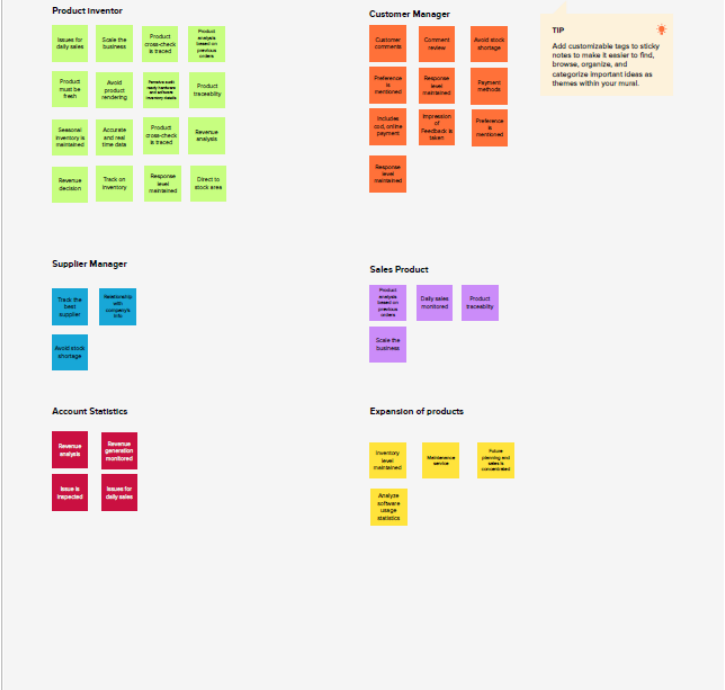
Write down any ideas that come to mind that address your problem statement.

10 minutes


## 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 and break it up into smaller sub-groups.

20 minutes

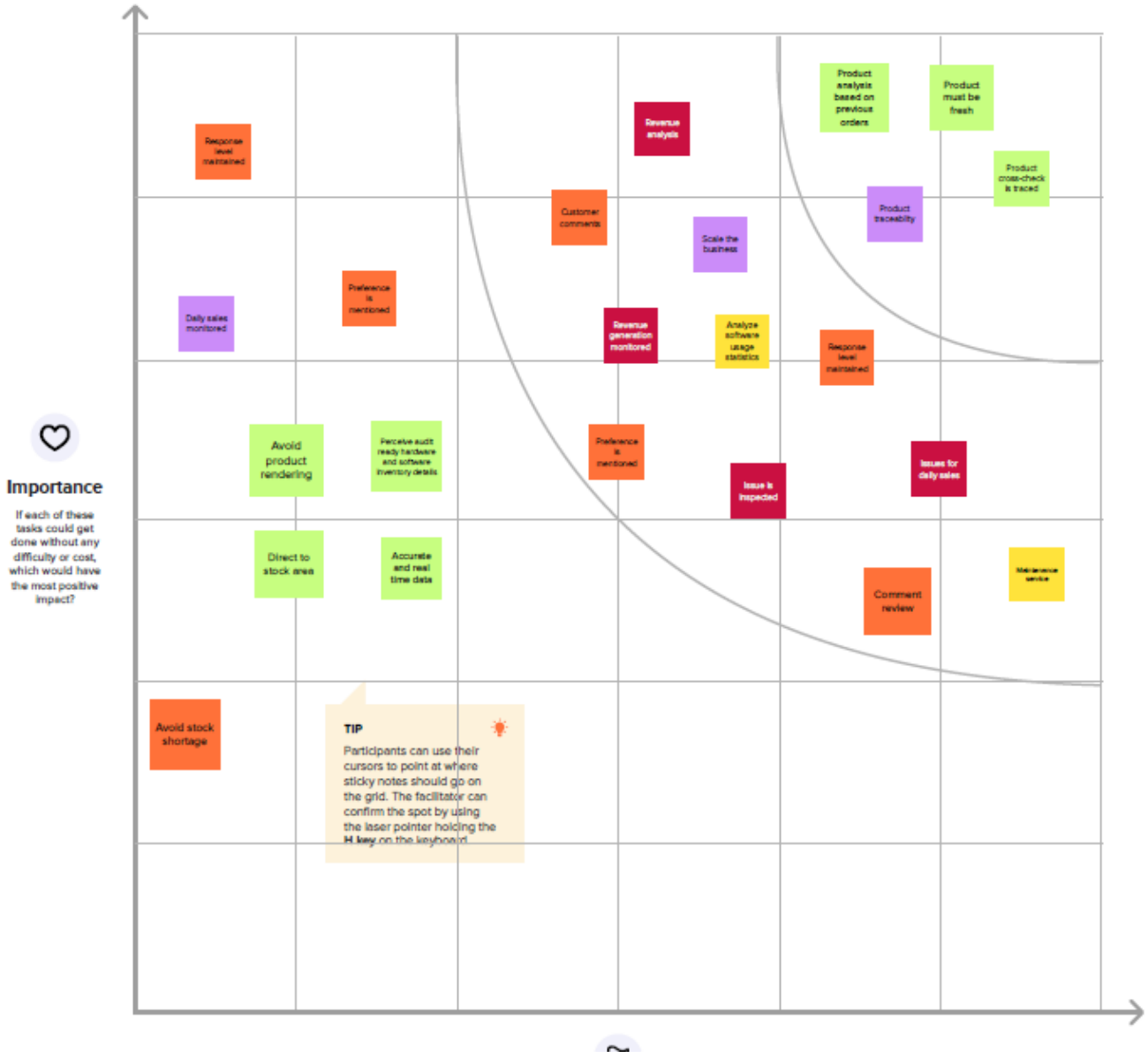


4

## 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

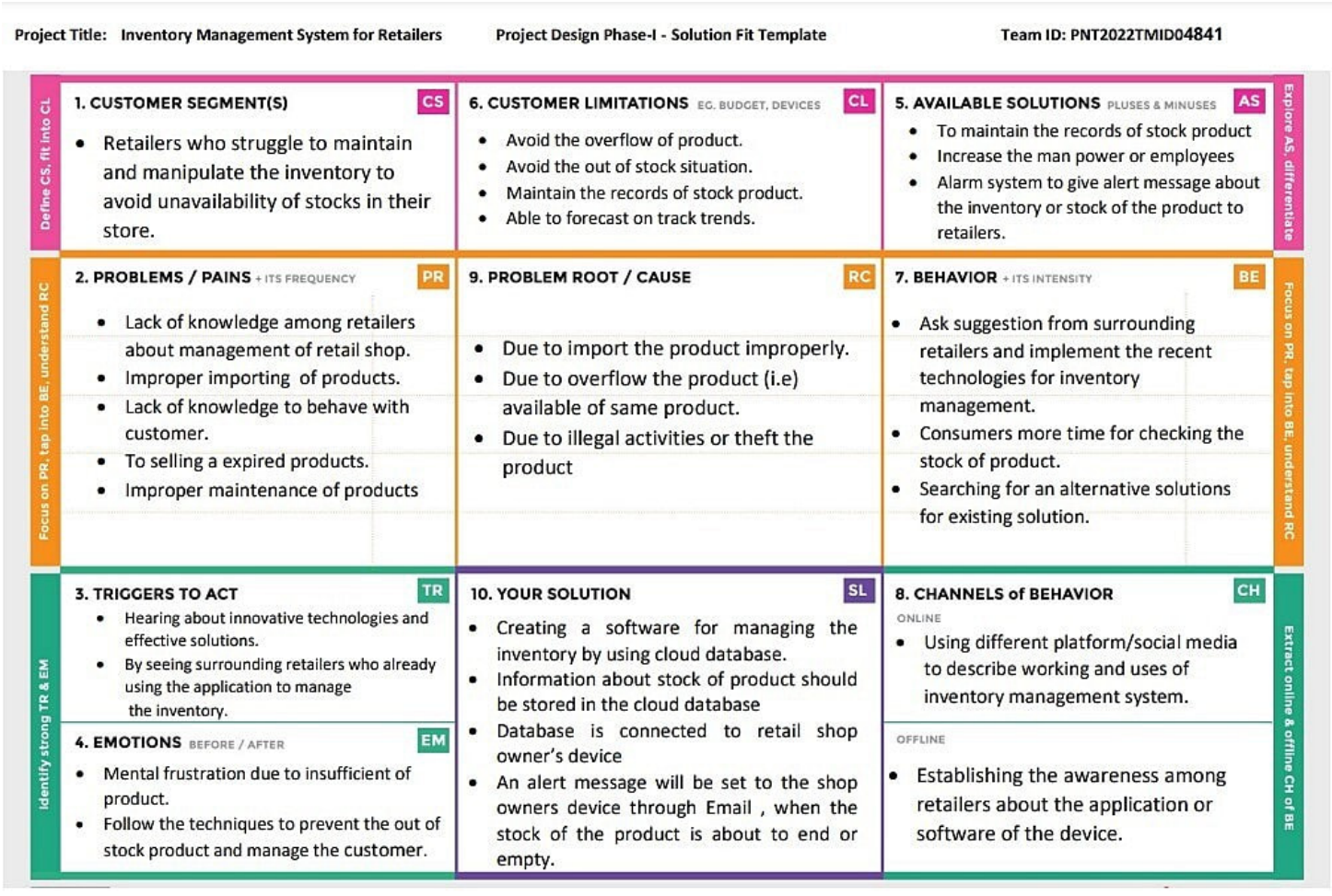
| S. NO | PARAMETER | DESCRIPTION |
|---|---|---|
| 1 | Problem Statement | To create an application that manages the inventory of an retailer |
| 2 | Idea / Solution Description | The application takes the stock count and maintain the stock availability and intimate requirements |
| 3 | Novelty / Uniqueness | Instead of checking the stock availability manually this application sends an email about the atock |
| 4 | ɔcial Impact / CustomerSatisfaction | This application reduces the manual tasks that need to be performed. This improves productivity in the workplace. |
| 5 | Business Model | This application can be used in every shops, effective for retailers<br><br>This application can also be integrated with billing system in shops |
| 6 | Scalability of the Solution | The application can easily be scaled to accept multiple inputs and process them parallelly to further increaseefficiency |

## 3.4 PROBLEM SOLUTION FIT

Problem-solution fit is a term used to describe the point validating that the base problem resulting in a business idea really exists and the proposed solution actually solves that problem.

**Purpose**:

1. **Validate that the problem exists:** When you validate your problem hypothesis using real-world data and feedback. That is, you gather information from real users to determine whether or not they care about the pain point you're trying to solve.
2. **Validate that your solution solves the problem:** When you validate that the target audience appreciates the value your solution delivers to them.



# CHAPTER 4

# REQUIREMENT ANALYSIS

## a. FUNCTIONAL REQUIREMENTS

Functional requirements may involve calculations, technical details, data manipulation and processing, and other specific functionality that define what a system is supposed to accomplish. The following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Registration | Registration through Form<br>Registration through Gmail |
| FR-2 | User Confirmation | Confirmation via Email<br>Confirmation via OTP |
| FR-3 | User Login | Login with username<br>Login with password |
| FR-4 | Product record | Product name<br>Stock count<br>Product category<br>Vendor details |
| FR-5 | Email Notification | Email through SendGrid<br>Reduced stock quantity<br>Email to both retailer and seller |
| FR-6 | Audit Monitoring | Monitor incoming and outgoing stock |

## 4.2 NON FUNCTIONAL REQUIREMENTS

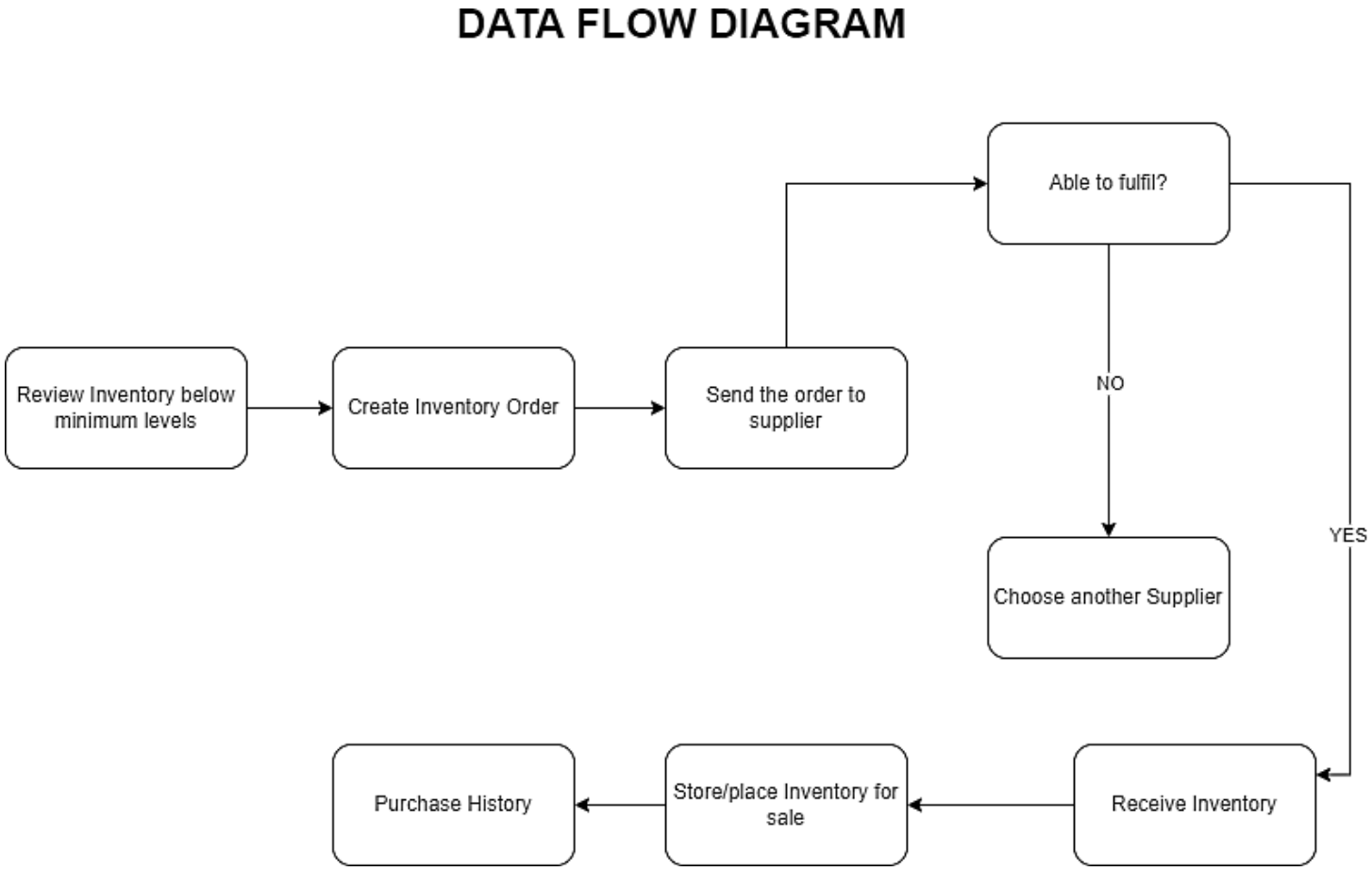
Non-functional requirement (NFR) is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviours. The following are the non-functional requirements of the proposed solution.

| NFR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | Highly portable, User-friendly and highly responsive UI for easy access |
| NFR-2 | **Security** | Access Control, User privileges, Password management features |
| NFR-3 | **Reliability** | Secure server for reliable and fault tolerant connection |
| NFR-4 | **Performance** | Reliable performance with high-end servers |
| NFR-5 | **Availability** | Service hosting server downtime should be negligible during upgradation |

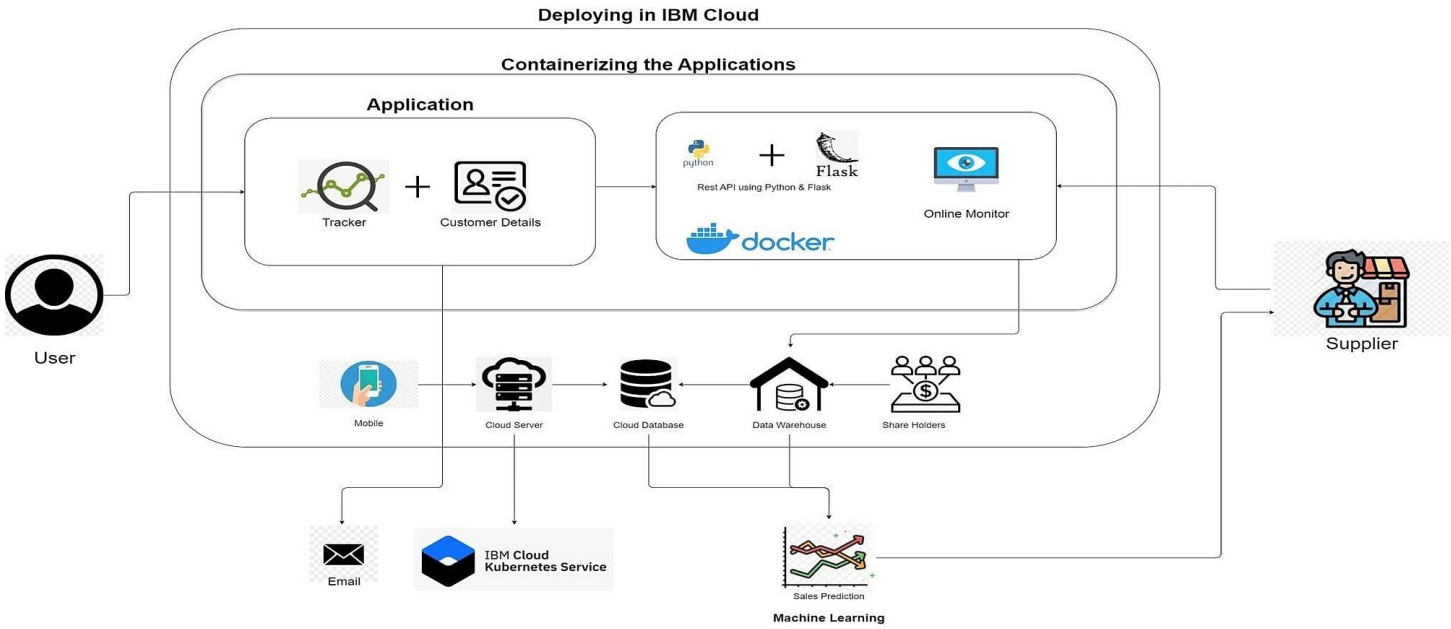
# CHAPTER 5

## PROJECT DESIGN

### a. DATA FLOW DIAGRAM




### b. SOLUTION & TECHNICAL ARCHITECTURE




## Table-1 : Components & Technologies

| S. No | Component | Description | Technology |
|---|---|---|---|
| 1. | User Interface | How user interacts with application e.g. Web UI, Mobile App, Chatbot, etc. | HTML, CSS, JavaScript, IBM Cloud Object Storage, Python-Flask, Kubernetes, Docker, IBM DB2, IBM Container Registry. |
| 2. | Application Logic | The logic for a process in the application | Python-Flask. |
| 3. | Database | Data Type Configuration etc. | MySQL, etc. |
| 4. | ChatBox | Chatbox for users to access help from a virtual assistant on the application. | IBM Watson Assistant |
| 5. | Cloud Database | Database Service on Cloud | IBM DB2 |
| 6. | File Storage | File storage requirements | IBM Cloud Object Storage |
| 7. | App Container | Contain the whole application in a single container. | Docker Container, IBM Container Registry |
| 8. | Infrastructure (Server / Cloud) | Application Deployment on Local System / Cloud<br>Local Server Configuration: port 5000<br>Cloud Server Configuration : | Local, Cloud Foundry, Kubernetes. |
| 9. | Send Mail | To send emails when low stock is present in the inventory to retailers. | IBM SendGrid |

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## Table-2: Application and characteristics

| S. No | Characteristics | Description | Technology |
|---|---|---|---|
| 1. | Open-Source Frameworks | We use HTML, CSS, Bootstrap and Flask as the open source for our application | HTML, CSS, JavaScript, Bootstrap, Python-Flask. |
| 2. | Security Implementations | User log in and authentication are done to provide secure access to their account. | IBM Cloud Security, Cookies.. |
| 3. | Scalable Architecture | The system can be scalable easily by using these technologies as to optimize, improve and add new features, allocate sufficient bandwidth to allow more users at a time, etc. | Docker, Kubernetes Cluster |
| 4. | Availability | System availability is high as we make sure the unwanted database access is minimized through SQL and code optimization. | IBM Db2, IBM Container Registry |
| 5. | Performance | Deployment is easy and fast by containerizing the application. Providing fast access time and responsiveness by deploying the application in cloud. | Flask, Docker, IBM Db2. |

## a. USER STORIES

| | 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 application 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 Facebook | I can register & access the dashboard with Facebook Login | Low | Sprint-3 |
| | | USN-4 | As a user, I can register for the application through Gmail | I can register for the application through Gmail | Medium | Sprint-2 |
| | Login | USN-5 | As a user, I can log into the application by entering email & password | I can log in by entering Gmail & password | High | Sprint-1 |
| | Dashboard | USN-6 | As a user, I can track data of sales of products and inventory levels | I can track data of sales of products and inventory levels. | High | Sprint-1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Customer (Web user) | Registration | USN-7 | 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-8 | 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-9 | As a user, I can register for the application through Facebook | I can register & access the dashboard with Facebook Login | Low | Sprint-3 |
| | | USN-10 | As a user, I can register for the application through Gmail | I can register for the application through Gmail | Medium | Sprint-2 |
| | Dashboard | USN-12 | As a user, I can track data of sales of products and inventory levels | I can track data of sales of products and inventory levels. | High | Sprint-1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Administrator | Manage the Stocks | USN-14 | As a administrator, I manage the stocks by adding, shipping and storing the stocks in the storage units | I manage the stocks by adding, shipping and storing the stocks in the storage units. | High | Sprint-1 |
| | Control all the users | USN-15 | As a administrator, I can control all the users by performing basic CRUD operations. | I can control all the users by performing basic CRUD operations | High | Sprint-1 |
| | Access the database | USN-16 | As a administrator, I can control and access the database | I can control and access the database. | High | Sprint-1 |

# CHAPTER 6

# PROJECT PLANNING AND SCHEDULING

## a. SPRINT PLANNING AND ESTIMATION

| TITLE | DESCRIPTION | DATE |
|---|---|---|
| **Literature Survey & Information Gathering** | Literature survey on selected project and gathering information by referring the project's related technical papers, research publications, etc. | 18 SEPTEMBER 2022 |
| **Prepare Empathy Map** | Prepare empathy map canvas to capture the user's pains & gains and prepare the list of problem statements. | 22 SEPTEMBER 2022 |
| **Ideation** | To list by the organizing brainstorm sessions and prioritize the top three ideas based on the feasibility and importance. | 23 SEPTEMBER 2022 |
| **Proposed Solution** | To prepare the proposed solution documents, which includes the novelty, feasibility of ideas, business model, social impact, scalability of the solution, etc. | 23 SEPTEMBER 2022 |
| **Problem Solution Fit** | Preparing the problem solution fit document. | 27 SEPTEMBER 2022 |

| | | |
|---|---|---|
| **Solution Architecture** | To prepare the solution architecture document | 27 SEPTEMBER 2022 |
| **Customer Journey** | Prepare the customers journey map help the customers understand the user interaction and experiences with the application from the beginning to the end. | 19 OCTOBER 2022 |
| **Functional Requirement** | Prepare the functional requirement document. | 28 OCTOBER 2022 |
| **Data Flow Diagrams** | Draw the data flow diagrams and submit for the review. | 29 OCTOBER 2022 |
| **Technology Architecture** | Prepare technical architecture diagram. | 28 OCTOBER 2022 |
| **Prepare Milestone & Activity List** | Prepare the milestones and activity of the project. | 28 OCTOBER 2022 |
| **Project Development – Delivery of Sprint-1, 2, 3 & 4** | Develop and submit the developed code by testing it and having no errors. | IN PROGRESS... |

## b. SPRINT DELIVERY SCHEDULE

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

Use the below template to create product backlog and sprint schedule

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my Password or by entering phone number and confirming by otp | 2 | High | Paulson, Pradeev |
| Sprint-1 | | USN-2 | As a user, I can register for the application through E-mail or phone number | 1 | Medium | Ponnazhagan, Poorvaja |
| Sprint-1 | Confirmation | USN-3 | As a user, I will receive confirmation email or otp once I have registered for the application | 1 | Medium | Pradeev, Poorvaja |

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Login | USN-4 | As a user, I can log into the application by entering email & password or using phone number and otp. | 2 | High | Ponnazhagan, Paulson |
| Sprint-2 | Dashboard | USN-5 | As a user, I can view the products which are available | 4 | High | Ponnazhagan, Pradeev |
| Sprint-3 | Stock Update | USN-7 | Once the product reaches the threshold level as a user ,I will be getting the notification to reorder the stock. | 5 | High | Paulson, Poorvaja |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sprint-4 | Expiry update | USN-8 | As a user, I will be notified about the expiry date of the products | 5 | High | Paulson, Pradeev |

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

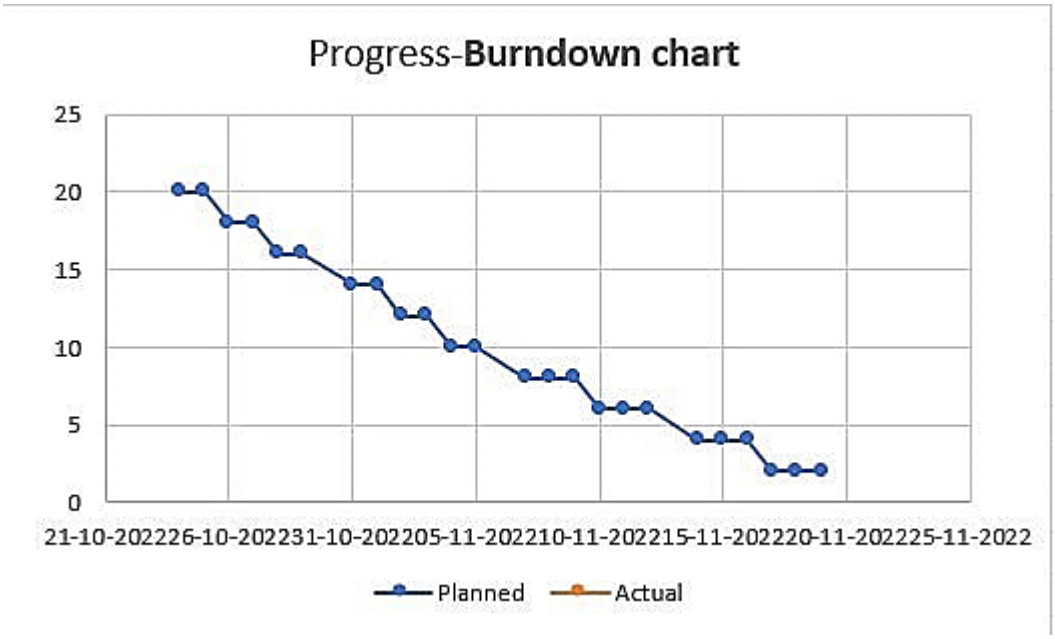
| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|---|---|---|---|---|---|---|
| Sprint-1 | 6 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 20 | 29 Oct 2022 |
| Sprint-2 | 4 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | | 05 Nov 2022 |
| Sprint-3 | 5 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | | 12 Nov 2022 |
| Sprint-4 | 5 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | | 19 Nov 2022 |

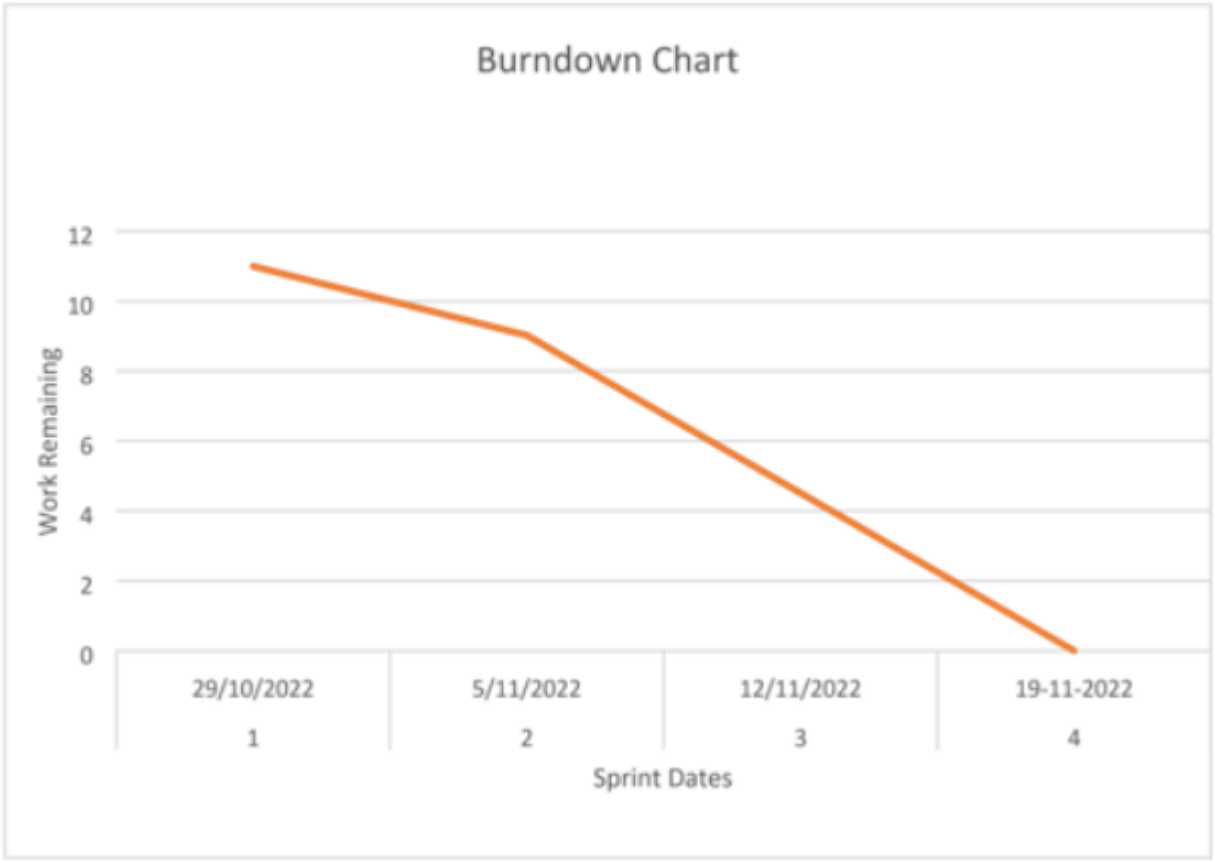
**Velocity:**

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)

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

**AV=20/6 =3.33**


Progress-Burndown chart
25
20
15
10
5
0
21-10-2022
26-10-2022
31-10-2022
05-11-2022
10-11-2022
15-11-2022
20-11-2022
25-11-2022
Planned
Actual


Burndown Chart
Work Remaining
12
10
8
6
4
2
0
29/10/2022
1
5/11/2022
2
12/11/2022
3
19-11-2022
4
Sprint Dates

# CHAPTER 7

# CODING & SOLUTIONING

## 7.1 Feature 1

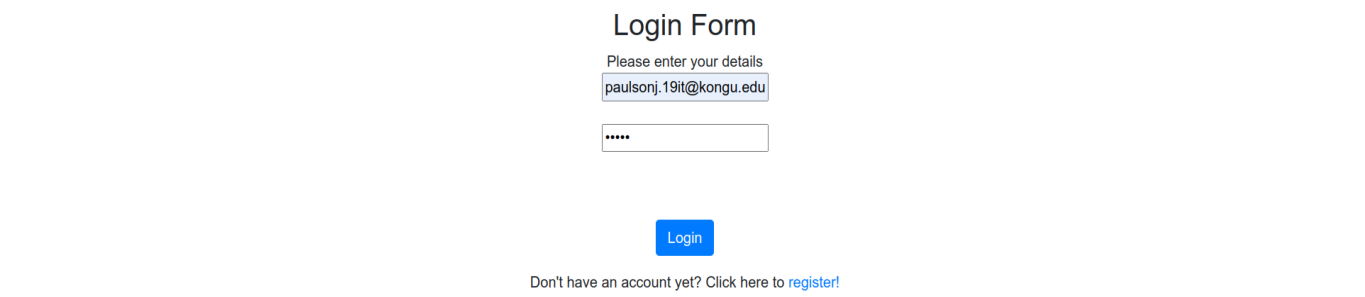
The main features of our project are to track product and details and users information. The project details includes product name, product id, quantity and price.

### Home Page

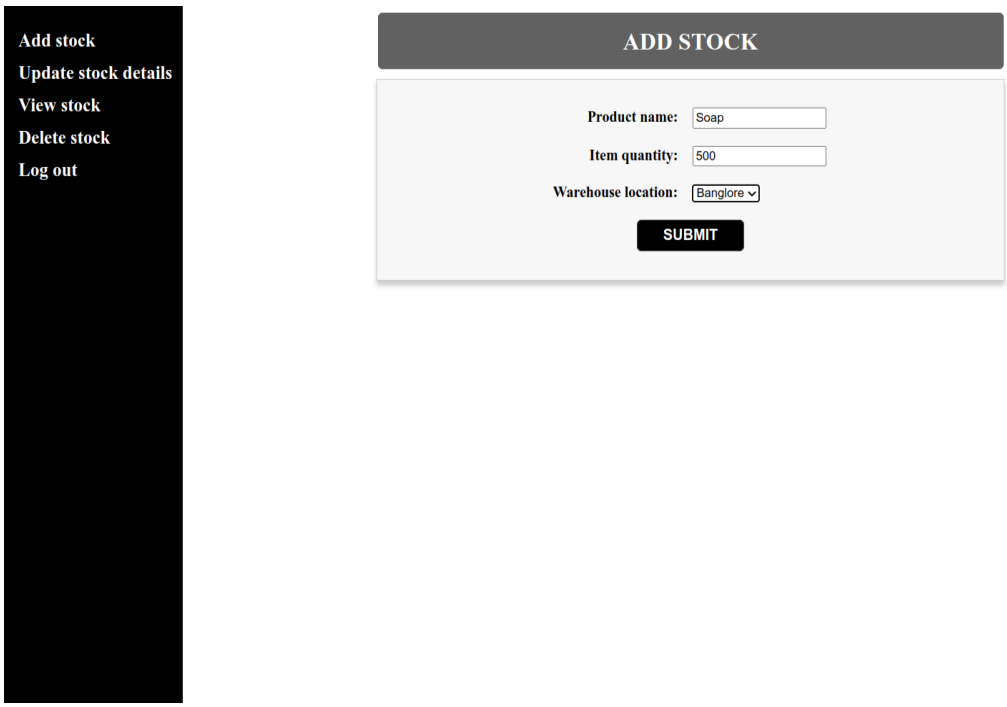

### Register page


Done by TMID PNT2022TMID04841

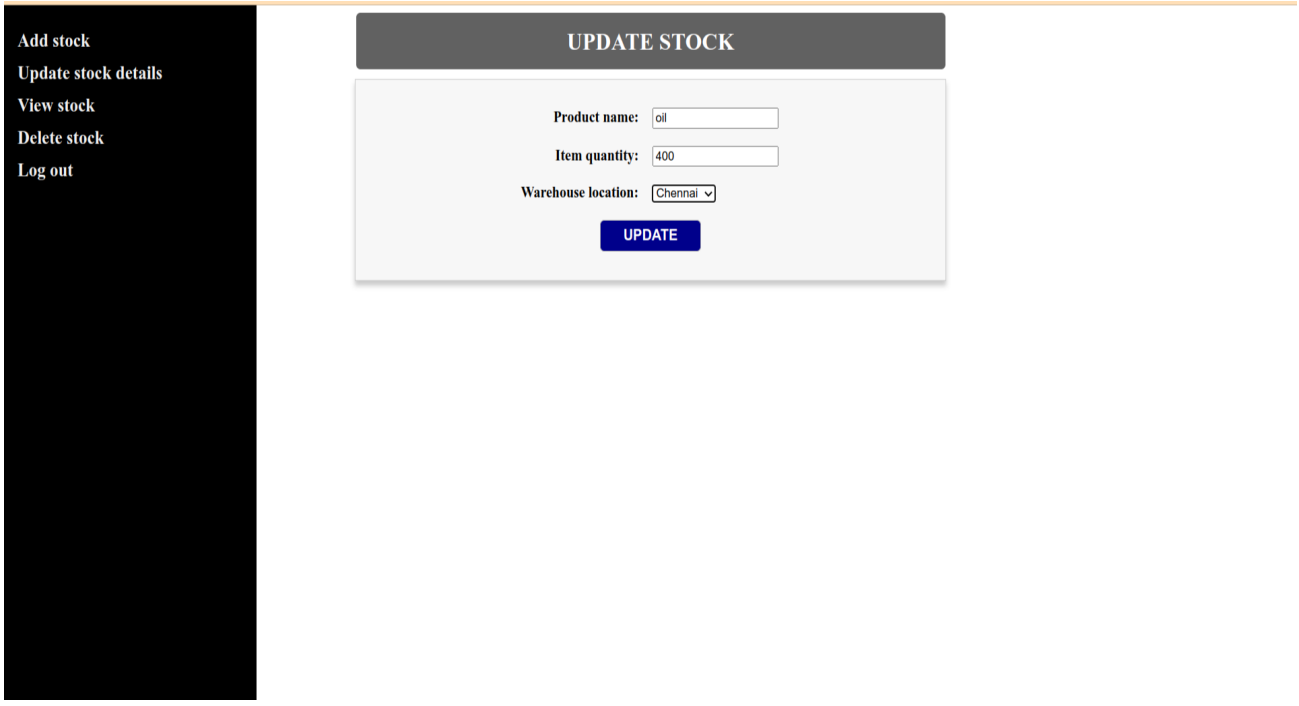
# Login page




# Product adding page



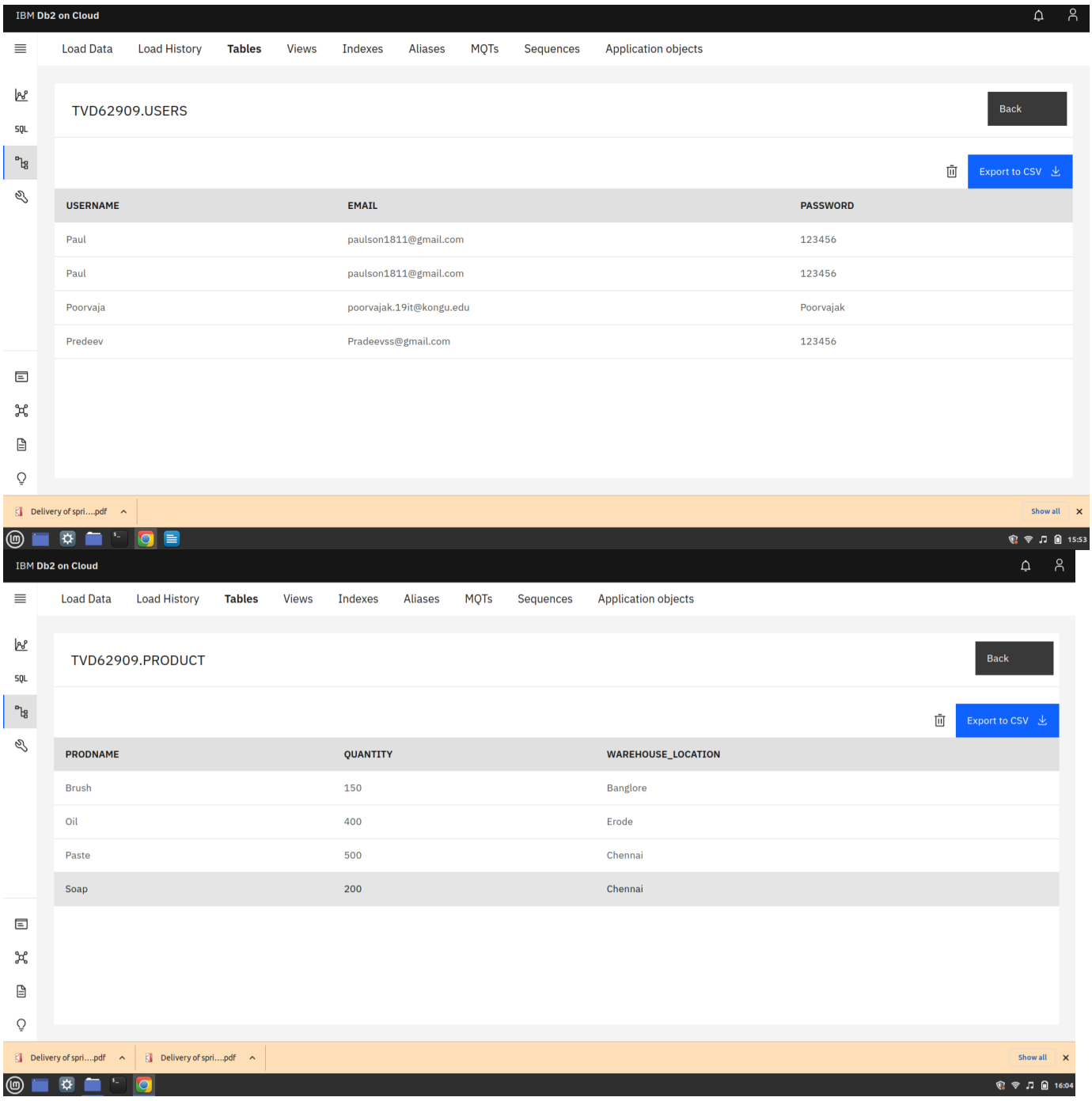

## Update page



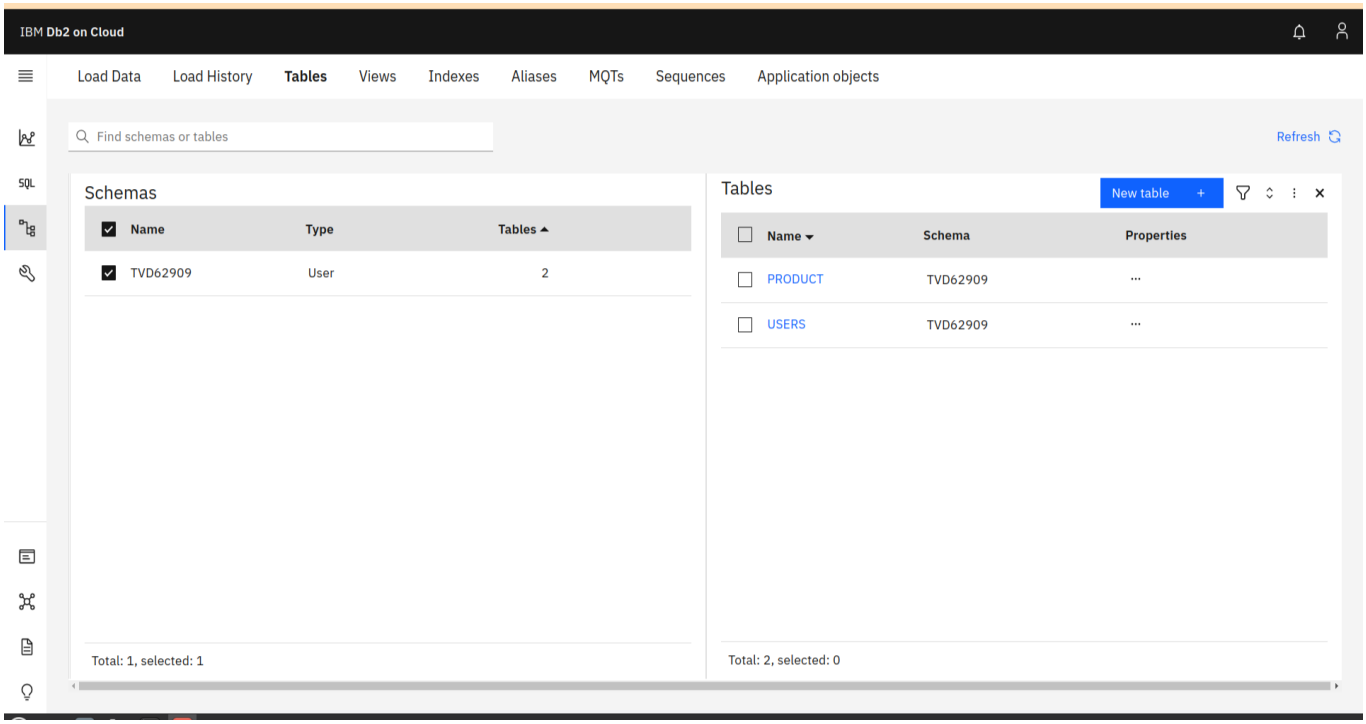

## 7.2 Feature 2

For the user information consist of user name, user id, gmail, password**.** If the stoct gets below desired limit, the warning to increase stock will be sent to user through email service.

**User and product cloud details**




# 7.3 Database Schema


IBM Db2 on Cloud
Load Data
Load History
Tables
Views
Indexes
Aliases
MQTs
Sequences
Application objects
Find schemas or tables
Refresh
Schemas
Name
Type
Tables
TVD62909
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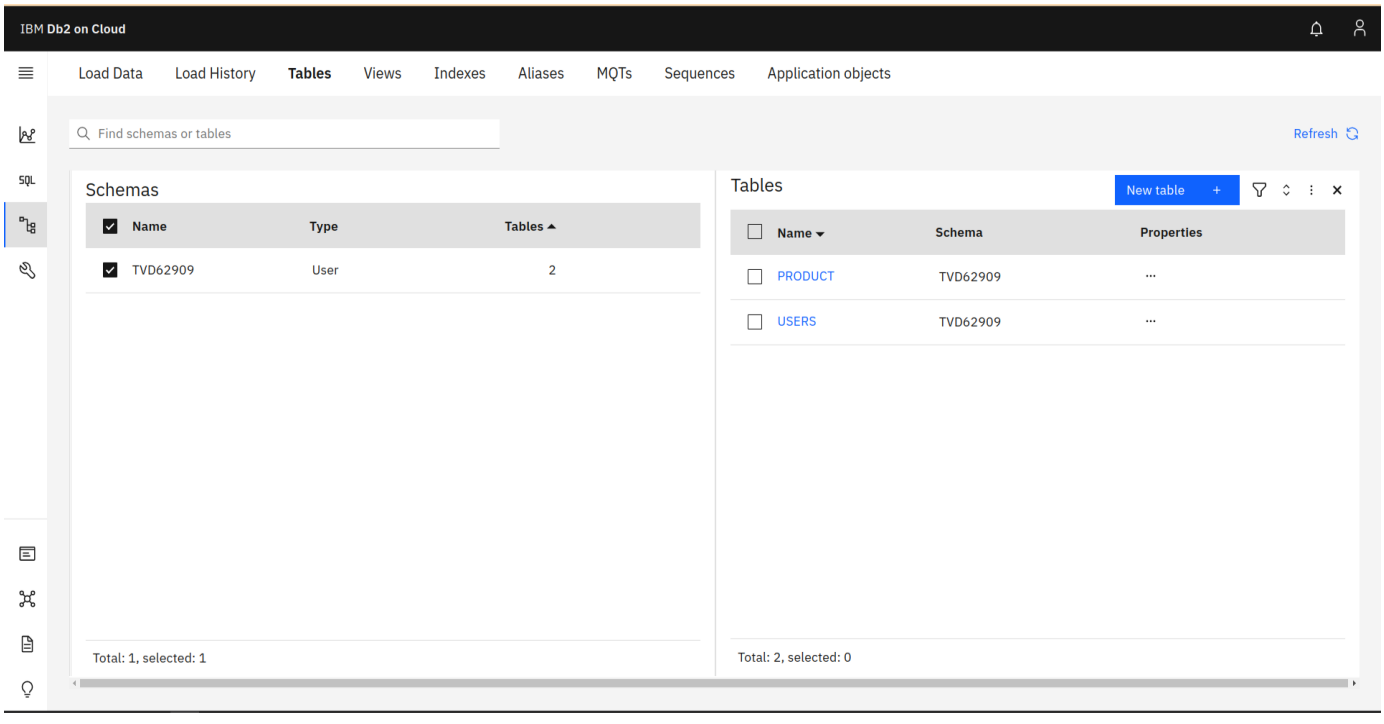
Tables
New table
Name
Schema
Properties
PRODUCT
TVD62909
USERS
TVD62909
Total: 2, selected: 0


IBM Db2 on Cloud
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Indexes
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Schemas
Name
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Tables
TVD62909
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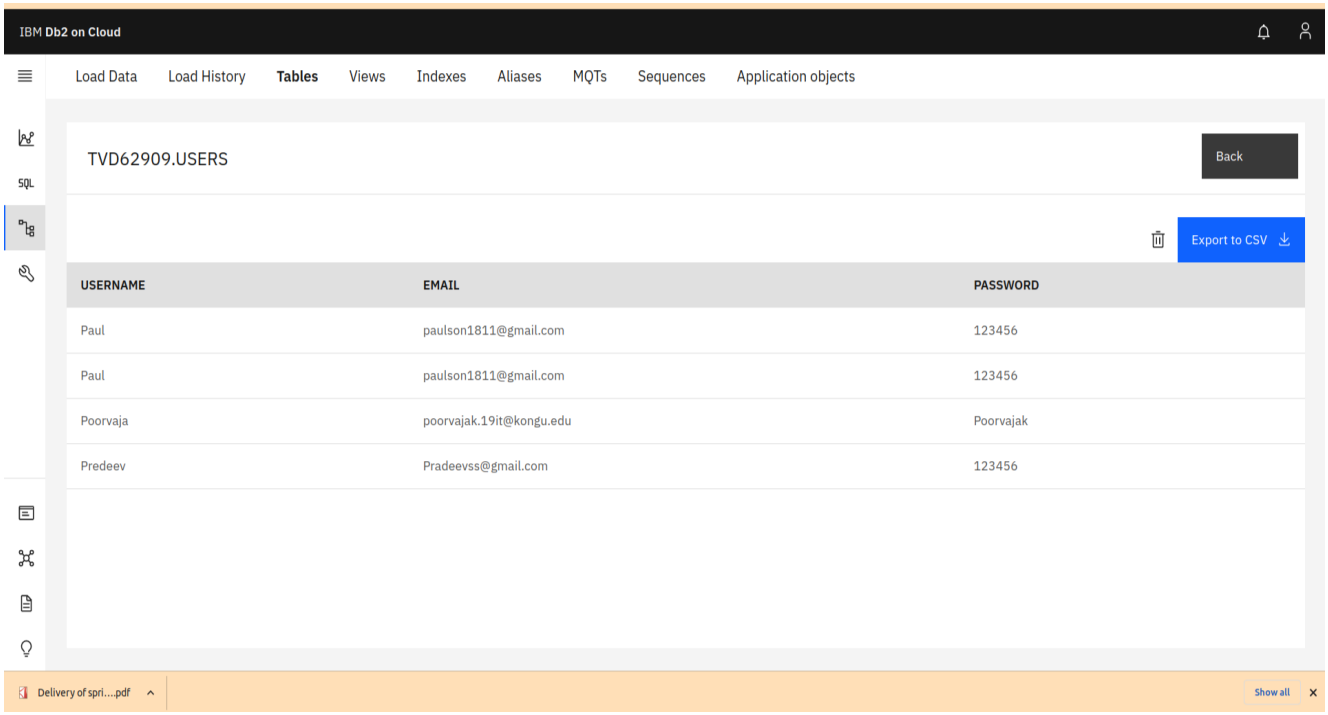
Name
Schema
Properties
PRODUCT
TVD62909
USERS
TVD62909
Total: 2, selected: 0




# CHAPTER 8

# TESTING

## 8. TESTING

### 8.1 Test Cases

**Login**

1. Verify user is able to see login page
2. Verify user is able to loginto application or not?
3. Verify login page elements

**Register**

1. Verify if user is able to enter all the details and register
2. Verify if user is redirected to login page once registered.

**Add products**

1. Verify user is able to add products in ad product page
2. Verify whether added products are correctly added in the table

**View products**

1. Verify whether products can be viewed in view page
2. Verify whether products can be retrieved correctly from database

**Update Products**

1. Verify user is able to update products in update page
2. Verify whether updated product details are correctly updated in the table
3. Verify if the product quantity is less than 5
4. Verify if an alert email has been sent to retailer if the product quantity is less

**Delete Products**

1. Verify user is able to delete product movements
2. Verify whether deleted product gets deleted from the table

**8.2 User Acceptance Testing**

| Test case ID | Feature Type | Component | Test Scenario | Pre-Requisite | Steps To Execute | Test Data |
|---|---|---|---|---|---|---|
| LoginPage_TC_001 | Functional | Home Page | Verify user is able to see the Login/Signup popup when user clicked on My account button | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Verify login/Singup popup displayed or not | Inventorymanagement localhost |
| LoginPage_TC_002 | UI | Home Page | Verify the UI elements in Login/Signup popup | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Verify login/Singup popup with below UI elements:<br>a.email text box<br>b.password text box<br>c.Login button<br>d.New customer? Create account link<br>e.Last password? Recovery password link | Inventorymanagement localhost |
| LoginPage_TC_003 | Functional | Home page | Verify user is able to log into application with Valid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter Valid username/email in Email text box<br>4.Enter valid password in password text box<br>5.Click on login button | Username: abisheklr66@gmail.com<br>password: abi123 |
| LoginPage_TC_004 | Functional | Login page | Verify user is able to log into application with InValid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter InValid username/email in Email text box<br>4.Enter valid password in password text box<br>5.Click on login button | Username: abisheklr66@gmail.com<br>password: abi123 |
| LoginPage_TC_004 | Functional | Login page | Verify user is able to log into application with InValid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter Valid username/email in Email text box<br>4.Enter Invalid password in password text box<br>5.Click on login button | Username: abisheklr66@gmail.com<br>password: abi1233ha82 |
| LoginPage_TC_005 | Functional | Login page | Verify user is able to log into application with InValid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter InValid username/email in Email text box<br>4.Enter Invalid password in password text box<br>5.Click on login button | Username: abisheklr<br>password: abi1233ha82 |


| Test case ID | Feature Type | Component | Test Scenario | Pre-Requisite | Steps To Execute | Test Data |
|---|---|---|---|---|---|---|
| LoginPage_TC_001 | Functional | Home Page | Verify user is able to see the Login/Signup popup when user clicked on My account button | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Verify login/Singup popup displayed or not | Inventorymanagement localhost |
| LoginPage_TC_002 | UI | Home Page | Verify the UI elements in Login/Signup popup | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Verify login/Singup popup with below UI elements:<br>a.email text box<br>b.password text box<br>c.Login button<br>d.New customer? Create account link<br>e.Last password? Recovery password link | Inventorymanagement localhost |
| LoginPage_TC_003 | Functional | Home page | Verify user is able to log into application with Valid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter Valid username/email in Email text box<br>4.Enter valid password in password text box<br>5.Click on login button | Username: abisheklr66@gmail.com<br>password: abi123 |
| LoginPage_TC_004 | Functional | Login page | Verify user is able to log into application with InValid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter InValid username/email in Email text box<br>4.Enter valid password in password text box<br>5.Click on login button | Username: abisheklr66@gmail.com<br>password: abi123 |
| LoginPage_TC_004 | Functional | Login page | Verify user is able to log into application with InValid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter Valid username/email in Email text box<br>4.Enter Invalid password in password text box<br>5.Click on login button | Username: abisheklr66@gmail.com<br>password: abi1233ha82 |
| LoginPage_TC_005 | Functional | Login page | Verify user is able to log into application with InValid credentials | | 1.Enter URL and click go<br>2.Click on My Account dropdown button<br>3.Enter InValid username/email in Email text box<br>4.Enter Invalid password in password text box<br>5.Click on login button | Username: abisheklr<br>password: abi1233ha82 |


# CHAPTER 9

## RESULTS

FInally we obtained a web application for inventary system for retailers it gives the major outcome of this application is stock managing features and intimation of retailers

about the stock availability. All the requirements for inventary system is obtained as mucha s possible.

# CHAPTER 10

## ADVANTAGES & DISADVANTAGES

### 10.1 ADVANTAGES:

1. **It helps to maintain the right amount of stocks:**

   Contrary to popular assumption, inventory management tries to maintain a balance where your inventory is operating at optimal efficiency and you do not need to have too many or too few inventories on hand at any given time. This helps you keep the proper quantity of stock on hand.

1. **It leads to a more organized warehouse**

   It results in a more organised warehouse since you can easily organise your warehouse with the help of an effective inventory management system. It will be quite challenging to maintain your inventory if your warehouse is disorganised

2. **It saves money and time:**

   A successful inventory management system can result in time and money

savings for the company. You can avoid the inconveniences of having to do an inventory recount in order to verify the accuracy of your records by keeping track of the merchandise you already have on hand.

3. **Increases productivity and efficiency:**

Inventory management tools like bar code scanners and inventory management software can significantly boost a company's productivity and efficiency.

## 10.2 DISADVANTAGES:

1. **Lack of a human touch:**

This is another drawback of inventory management. The availability of products across the globe is facilitated by large supply chain management systems, and the majority of them offer customer service support in the event of a problem, but the increase in infrastructure can frequently mean a loss of the personal touch that makes a company stand out from the competition.

1. **Increased room is required to hold the inventory:**

Unless the products you trade in are extremely small in size, a warehouse will be required to store your inventory. In addition, you will require workers, forklifts to transport the stock, and shelves and racks to store your products.

1. **Complexity:**

Some inventory management techniques and strategies might be challenging for personnel to comprehend and relatively sophisticated. Employee training may be required as a result so they can understand how the system operates.

1. **High implementation costs:**

Because the business must install specialised systems and software in order to use them, some inventory management systems can be expensive to implement.

# 11. CONCLUSION

Thus, the projected using IBM CLOUD is tested,verified and executed successfully.

## 12. FUTURE SCOPE

In feature, we planned using implemented this project in large scale which will be helpful and used by all the people.

## 13. APPENDIX

### 13.1 Scurce Code

#### HOME.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css"
rel="stylesheet" integrity="sha384-
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi"
crossorigin="anonymous">
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.bundle.min.js"
integrity="sha384-
OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+mo//f6V8Qbsw3"
crossorigin="anonymous"></script>
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>IMS | HOME</title>
    <meta charset="UTF-8">
        <!-- favicon-->
        <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico"
type="image/x-icon"> -->
        <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->
        <link rel="icon" type="image/png" sizes="16x16" href="#">
        <!-- bootstrap css cdn -->
        <link rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.c
ss"integrity="sha384-
JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z"
```

```
crossorigin="anonymous">
        <link rel="stylesheet"
    href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
    awesome.css">
        <!-- css stylesheet -->
        <link rel="stylesheet" href="static/css/style.css">
        <!-- font styles cdn -->
        <link rel="preconnect" href="https://fonts.gstatic.com">
        <link
    href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap"
    rel="stylesheet">
        <link
    href="httrdinglyps://fonts.googleapis.com/css2?family=Alegreya:wght@600&di
    splay=swap" rel="stylesheet">
    </head>
    <body>
        <!-- bootstrapnavbar -->
        <nav class="navbar sticky-top navbar-expand-lg navbar-dark">
            <div class="container-fluid">
                <a class="main-logo-img mt-3" href="#"><img
    src="/static/img/imsicon.png" alt="sheep-logo" height="50px" width="180px">
                    <!-- <a class="navbar-brand"
                    href="index.html">JobPortal</a>
    -->
                </a>

                <div class="row donate-sponsor">
                    <a type="button" class="btn btn-success mr-1"
    id="donate"href="login">LOGIN</a>
                    <a type="button" class="btn btn-warning mr-1"
    id="sponsor"href="register">REGISTER</a>
                    <a type="button" class="btn btn-primary mr-1"
    id="sponsor"href="contact.html">CONTACT US</a>
                </div>
            </div>
        </nav>
        <!-- navbarends -->
        <!-- what wefocus on -->
        <section class="our-focus">
            <div class="container">
```

<h2 class="text-center mt-3">ABOUT US</h2>

<!-- <img src="assets/img/home kids.jpg" class="card-img-top" alt="..."> -->

<h5 class="card-title">PURPOSE</h5>
An inventory management system isthe process by which you track your goods throughout your entire supplychain, from purchasing to production to end sales. It governs how you approachinventory management for your business.

<!-- <img src="assets/img/friendship day.JPG"class="card-img-top" alt="..."> -->

<h5 class="card-title">VISION</h5>
The primary goal of inventory management is to ensure that all kinds of materials are accessible wheneverthe production department needs them, ensuring that production is not stopped or slowed down due to a lack of resources.

<!-- <img src="assets/img/health camp.jpg" class="card-img-top" alt="..."> -->

<h5 class="card-title">OBJECTIVE</h5>
 The main aim of an inventorymanagement system is to keep the stock in such a way that it is neither overstock nor understock. The overstock condition will reduce the other production processes and understock will lead to stoppage of work. Theobjectives of inventorymanagement are

```
operational and financial.</p>
                                    </div>
                                </div>
                            </div>
                        </div>
                    </d
                    iv>
                    </s
                    ecti
                      o
                     n>
                <!-- focus sectionends -->
<!-- footer starts-->
  <!-- Site footer-->
                    <footer class="footer">

                      <div class="container mt-5">
                        <div class="row">
                            <h3>INVENTORY MANAGEMENT SYSTEM FOR
                            RETAILERS</h3>
                            <p class="text-justify">Inventory Management
System is aprocess of ordering, storing, and using inventories. This stock
managementincludes generating the lead on raw materials, components,
and finished products, along-side warehousing, and processing of such
items in your company. The available stock of inventories must be
physically counted before it is put on the balancesheet.</p>
 </div></div><hr> </div></div></footer> </body></html>
```

## Register.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css"
rel="stylesheet" integrity="sha384-
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi"
crossorigin="anonymous">

                <script
```

```
src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.bundle.min.js" integrity="sha384-OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+mo//f6V8Qbsw3" crossorigin="anonymous"></script>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>IMS | LOGIN</title>
        <!-- favicon-->
        <!-- <link rel="shortcut icon" href="/assets/img/favicon.ico"type="image/x-icon"> -->
        <!-- <link rel="icon" href="/assets/img/favicon.ico" type="image/x-icon"> -->
        <link rel="icon" type="image/png" sizes="16x16"href="/assets/img/favicon-32x32.png">
        <!-- bootstrap css cdn -->
        <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" integrity="sha384-JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDGMN5t9UJ0Z" crossorigin="anonymous">
        <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.css">
        <!-- css stylesheet -->
        <link rel="stylesheet" href="static/css/style.css">
        <!-- font styles cdn -->
        <link rel="preconnect" href="https://fonts.gstatic.com">
        <link href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap" rel="stylesheet">
        <link href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&display=swap"rel="stylesheet">
</head>
<body>
    <!-- bootstrap navbar -->
    <div class="logo mt-3 text-center">
        <a class="main-logo-img mt-5" href="#"><img src="static/img/imsicon.png" alt="sheep-logo" height="50px" width="180px">
```

```
                    <!-- <a class="navbar-brand" href="index.html">JobPortal</a> --
                    >
                </a>
            </div>
            <!-- navbarends -->
            <!-- Login form -->
            <div class="login text-center mt-5">
                <h2> RegisterForm </h2>
                <form action="/register" method="post">
                <div class="msg">{{ msg }}</div>
                    <!-- <inputtype="text" placeholder="fullname" id="fullname">
</br></br> -->
                    <input type="text" name="username"
placeholder="Enter YourUsername"   id="username"
required></br></br>
                        <input type="email" name="email"
placeholder="EnterYour Email ID"   id="email" required></br></br>
                        <input type="password" name="password"
placeholder="Enter Your Password" id="password"
required></br></br>
                    </br></br>
                <button type="submit" id="button" class="btn btn-primary"> Register
</button>
                </form>
            </div>

            <div class="note mt-3 text-center"> <!--Register form -->
            <p> alreadyhave an account ? pleaselogin   <a href="/login">login! </a>
</p>
            </div>
</body>
</html>
```

## Login.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css"
rel="stylesheet" integrity="sha384-
```

```
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi"
crossorigin="anonymous">
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.bundle.min.js"
integrity="sha384-
OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+mo//f6V8Qbsw3"
crossorigin="anonymous"></script>
        <meta http-equiv="X-UA-Compatible" content="IE=edge">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
        <title>IMS | LOGIN</title>
            <!-- favicon-->
            <!-- <link rel="shortcut icon"
    href="/assets/img/favicon.ico"type="image/x-icon"> -->
            <!-- <link rel="icon" href="/assets/img/favicon.ico"
    type="image/x-icon"> -->
            <link rel="icon" type="image/png"
    sizes="16x16"href="/assets/img/favicon-
    32x32.png">
            <!-- bootstrap css cdn -->
            <link rel="stylesheet"
    href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.c
    ss" integrity="sha384-
    JcKb8q3iqJ61gNV9KGb8thSsNjpSL0n8PARn9HuZOnIxN0hoP+VmmDG
    MN5t9UJ0Z" crossorigin="anonymous">
            <link rel="stylesheet"
    href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-
    awesome.css">
            <!-- css stylesheet -->
            <link rel="stylesheet" href="static/css/style.css">
            <!-- font styles cdn -->
            <link rel="preconnect" href="https://fonts.gstatic.com">
            <link
    href="https://fonts.googleapis.com/css2?family=Alegreya&display=swap"
    rel="stylesheet">
            <link
    href="https://fonts.googleapis.com/css2?family=Alegreya:wght@600&displ
    ay=swap"rel="stylesheet">
    </head>
    <body>
        <!-- bootstrap navbar -->
        <div class="logo mt-3 text-center">
```

```
            <a class="main-logo-img mt-5" href="#"><img
src="static/img/imsicon.png" alt="sheep-logo" height="50px"
width="180px">
                <!-- <a class="navbar-brand" href="index.html">JobPortal</a> --
                >
              </a>
      </div>
        <!-- navbarends -->
      <!-- Login form -->
      <div class="login text-center mt-5">
            <h2> Login Form </h2>
            <form action="/login" method="post">
            <div class="msg">{{ msg }}</div>
                <input type="text" name="username"
placeholder="Enter YourUsername"   id="username"
required></br></br>

                            <input type="password" name="password"
placeholder="Enter Your Password" id="password"
required></br></br>
                </br>
                </br>
            <button type="submit" id="button" class="btn btn-primary"> Login
</button>
            </form>
      </div>
      <div class="note mt-3 text-center"> <!--Register form -->
      <p> Don't have an account yet? Click
here to <ahref="register">register! </a> </p>
      </div>
</body>
</html>
```

Source Code

**GitHub Link**

## git@github.com:IBM-EPBL/IBM-Project-23454-1659883591.git

## Project demo link

https://drive.google.com/file/d/1JgbMarG64gwU6kfUS2laLukBTU8YwGQV/view?usp=drivesdk