PROJECT REPORT FORMAT

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

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.

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.

Once retailers successfully log in to the application they can update their inventory details, also users will be able to add new stock by submitting essential details related to the stock. They can view details of the current inventory. The System will automatically send an email alert to the retailers if there is no stock found in their accounts. So that they can order new stock.

1.2 PURPOSE

To Measure and report warehouse performance metrics like inventory turnover, customer satisfaction, and order processing speed to overcome warehouse inefficiencies. Share this data with employees and suppliers.

For frequent stock auditing processes, like daily cycle counting, reduce human error and provide more accurate, up-to-date inventory data for managing cash flow. Organize audits by category and cycle count smaller inventory samples on a predictable schedule for more accurate financial data

To integrate with accounting and sales data to help you predict demand and schedule orders based on shifting customer preferences, material availability or seasonal trends.

To Add images with product descriptions in your inventory database to improve purchasing and receiving processes, enhance accuracy and prevent misplaced inventory.

To Monitor and track supplier data, such as shipment errors, damaged or defective products, and missed delivery appointments. Measure your supplier’s performance tofind and fix supply chain disruptions, reduce complexity and streamline logistics.

To manage changing trends, such as packaging initiatives to reduce plastic waste. Categorize stock by packaging type, dimensions and product. Use this information to control shipping costs and storage location better

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

S.NO.	PAPER TITLE	AUTHOR NAME	PUBLICATION YEAR	RESULTS
1.	Research on the optimization of retailer inventory strategy based on system dynamics simulation	Lin Yang, Kaihu Hou, Jinyuan Zhong	2012	Supply chain inventory management system is an integrated system, and the operation process of the supply chain is much more complex in reality than a simulation model. This paper focused on a two-stage supply chain inventory management system and it was simplified rationally.
2.	A Study on Supermarket Chains of Multi-category Inventory Management Strategy	Lu Qing	2010	We can get the demand of goods by using smooth exponential model. Kinds of goods in the supermarket can be classified by a retailer-oriented category partition method. Category classification indicators are the average gross rate and category sales volume. To quantify indicators, we use industry average gross rate distinguish 1 a and a2 and ABC method distinguish 1 b , 2 b and 3 b .

3.	Inventory Management Challenges for B2C E-commerce Retailers	HarishPatila Brig.RajivDivekar	2014	To analyze whether the consumer seeks any values and benefits in educating their children. To explore the opportunities to bridge the gap between the supply and demand. The outcome would provide stepping stone for entrepreneurs and education organizations. This would help them in clearly designing and defining their products and services.
4.	Inventory Management and Its Effects on Customer Satisfaction	Scott Grant Eckert	2007	This study examines inventory management and the role it plays in improving customer satisfaction. It looks at how food companies have been under pressure to streamline their inventory systems, and the consequences of such actions. It also examines how many retailers are trying to implement a “perfect order” system and how suppliers are constantly under pressure to meet the demands of these retailers.. The paper also outlines the methodology used in the research and concludes by pointing out the limitations of the research as well as suggestions for further research.

5	Forecasting intermittent demand for inventory management by retailers	XinTian HaoqingWang ErjiangE	2021	This study proposes a Markov- combined method (MCM) for forecasting intermittent demand, which takes into account the inventory status and historical sales of products. We divide the prediction process into two stages. In the first stage, the transition probabilities of the four basic states of demand and inventory are calculated. In the second stage, the corresponding and appropriate prediction method is selected according to the predicted state. Further, using two large datasets from the two biggest e-commerce companies in China, we verify our results and show that the MCM forecasts more accurately than the Single Exponential Smoothing (SES), Syntetos-Boylan Approximation (SBA), and Croston (CR) methods. The MCM can be as an alternative method for forecasting intermittent demand because it is easy to compute and typically more accurate than the classical forecasting methods.

2.2 REFERENCES

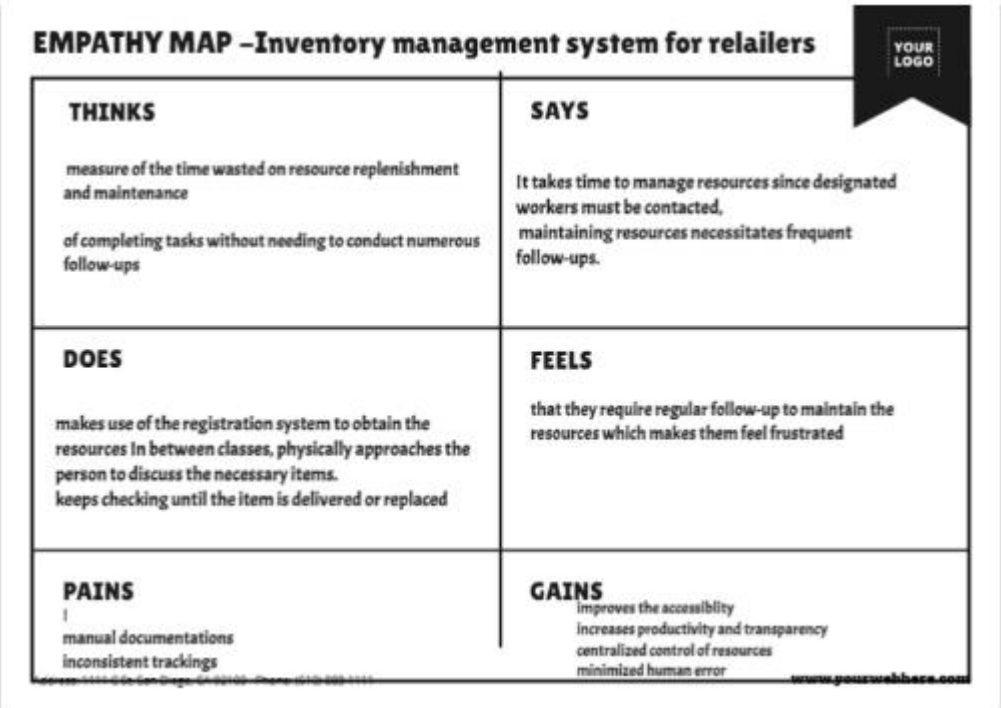
https://ieeexplore.ieee.org/document/6252235/
https://ieeexplore.ieee.org/abstract/document/5591386
https://www.sciencedirect.com/science/article/pii/S2212567114002214
https://www.researchgate.net/publication/254410703_Inventory_Management_and_Its_Effects_on_Customer_Satisfaction
https://www.sciencedirect.com/science/article/abs/pii/S0969698921002289#:~:text=In%20the%20retail%20industry%2C%20there,and%20historical%20sales%20of%20products.

2.3 PROBLEM STATEMENT DEFINITION

To create a web application for retailers to help them track and manage stocks for their products. The application will have seperate accounts for retailers where they can update their inventory details and be able to add new stock by submitting essential details related to stock. If stock is unavailable emails will be sent so that they can order new stock.

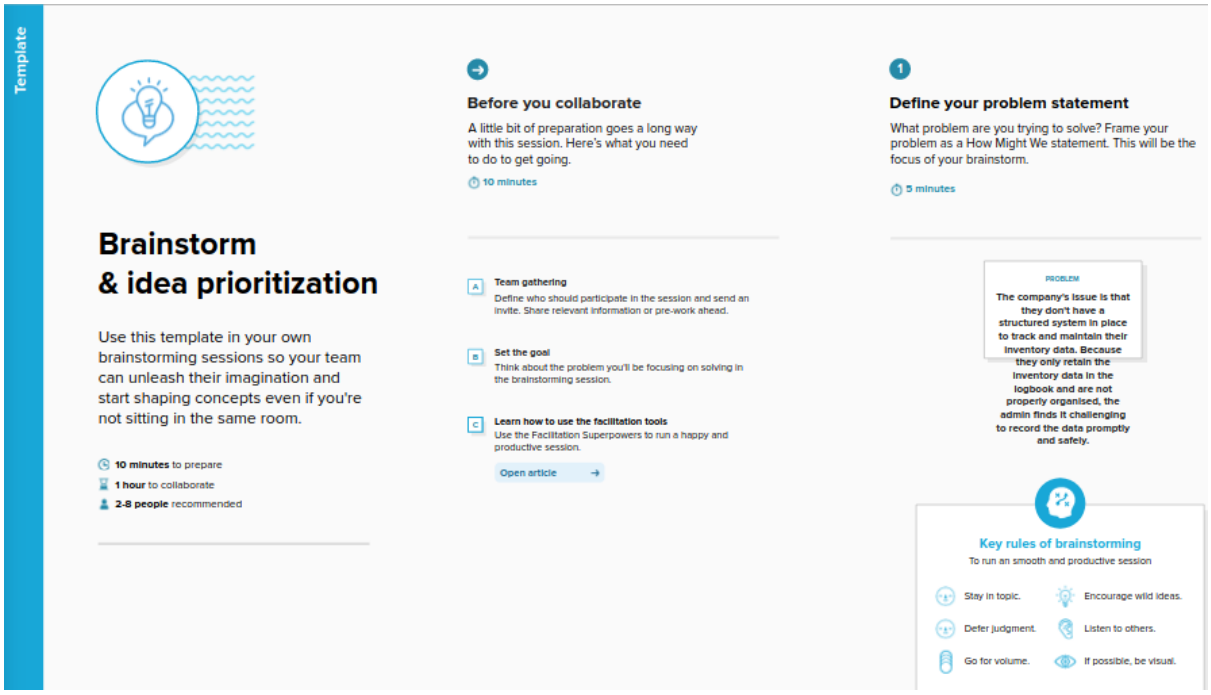
3. IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

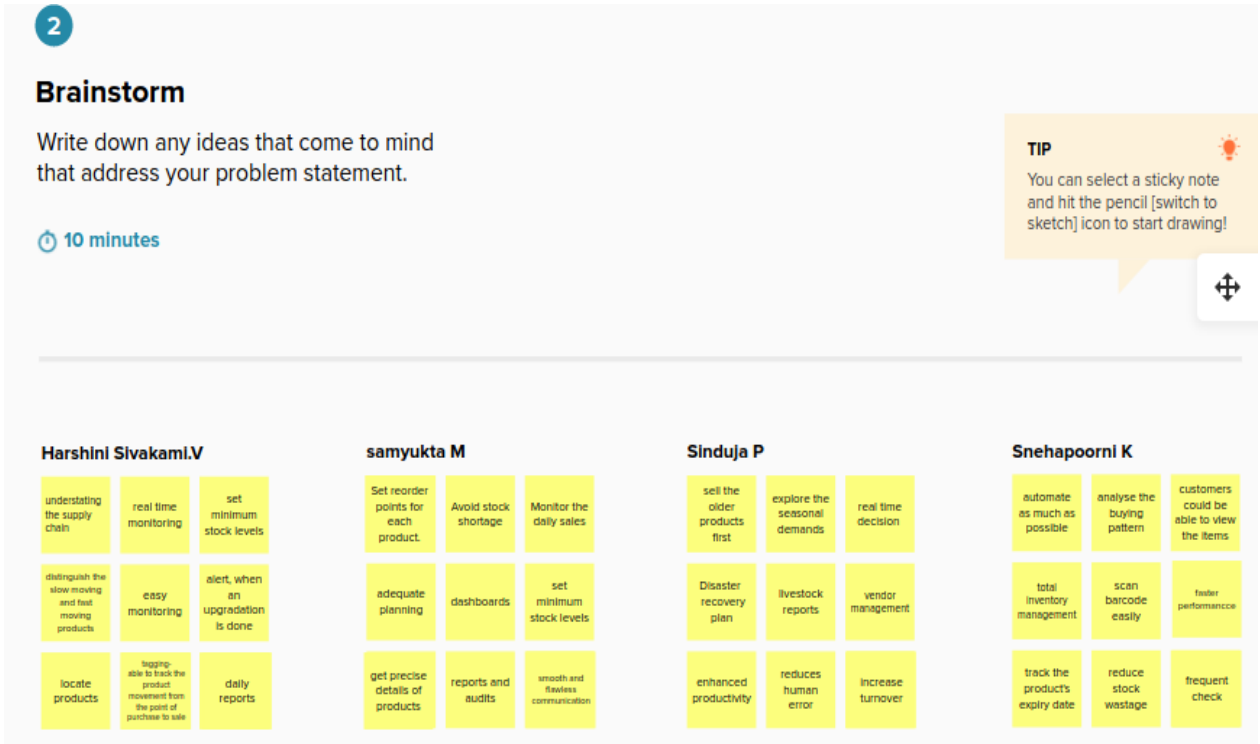


3.2 IDEATION AND BRAINSTORMING

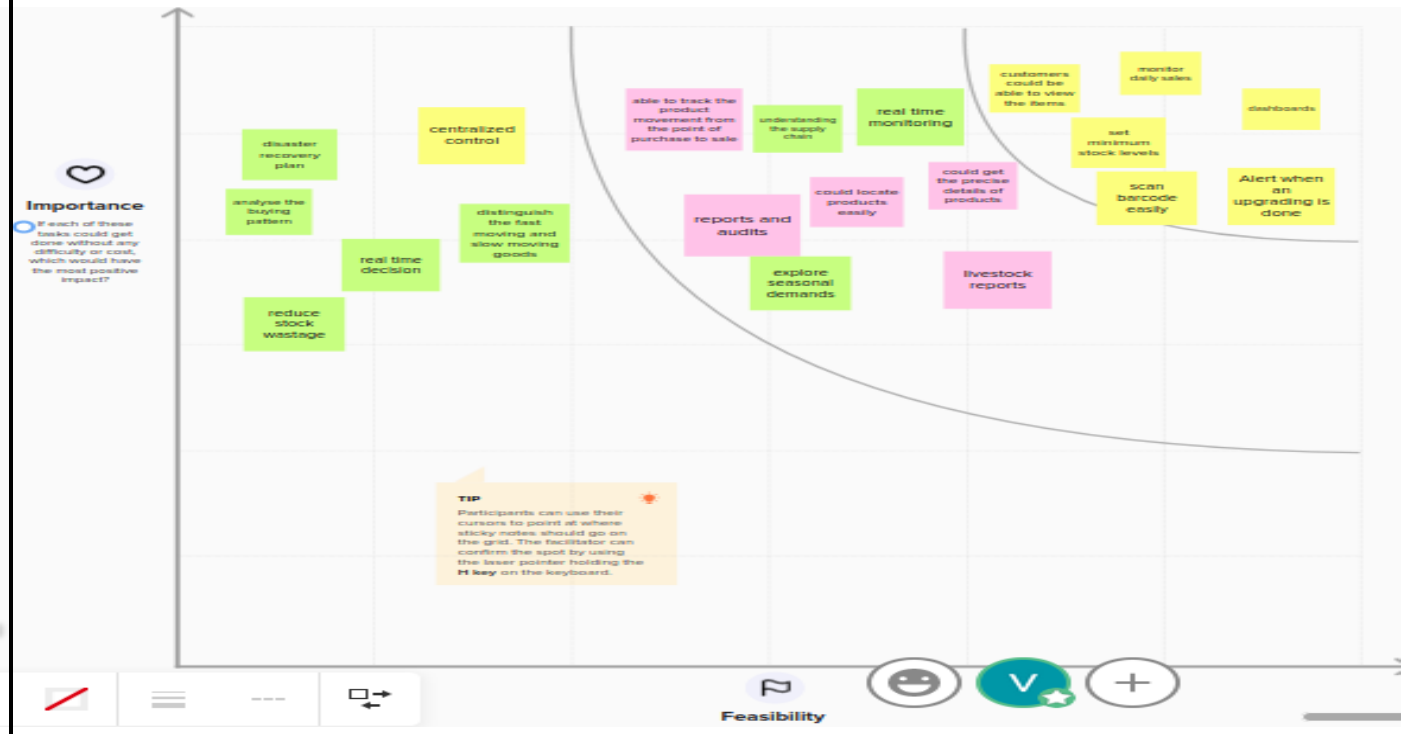
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The company's issue is that they don't have a structured system in place to track and maintain their inventory data. Because they only retain the inventory data in the logbook and are not properly organised, the admin finds it challenging to record the data promptly and safely.
2.	Idea / Solution description	Our aim is to design an application which is used to manage the inventory stocks. Users could be able to view the available items. Dashboards to monitor and analyse the buying patterns,daily reports and audits. An alert will be sent if any updation is done.
3.	Novelty / Uniqueness	Retailers are informed when the product is close to run out and urge the customer to purchase more. supplying key performance indicators for stock analysis. Demand-based pre-orders for advanced supplies.
4.	Social Impact / Customer Satisfaction	It helps to track stock availability and increase the profit and helps in reducing the stock wastage.
5.	Business Model (Revenue Model)	More reliable and user friendly model
6.	Scalability of the Solution	Could handle large number of users and data.

3.4 PROBLEM SOLUTION FIT

	3. TRIGGERS **Organizations wants to make their Inventory Management works to be done faster to keepup with their competitors..- They want their work to be done automatic as possible.- They want it to be error less.** **4. EMOTIONS: BEFORE / AFTER** **EM** Before: Tired, overwhelmed , forgetful After: stressfree, managable	**10. YOUR SOLUTION** **SL** Our aim is to design an application which is used to manage the inventory stocks. Users could be able to view the available items. Dashboards to monitor and analyse the buying patterns,daily reports and audits. An alert will be sent if any updation is done.	**8.CHANNELS of BEHAVIOUR** **8.1 ONLINE** **Remote accessibility,** **8.2 OFFLINE** **sms notifications**

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Phone number Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Adding new stock	Enter stock details such as quantity Confirmation Amount of purchase
FR-4	Monitoring stocks	List of stocks option Quantity of desires stock to be displayed Alert when insufficient stock through Mail account.

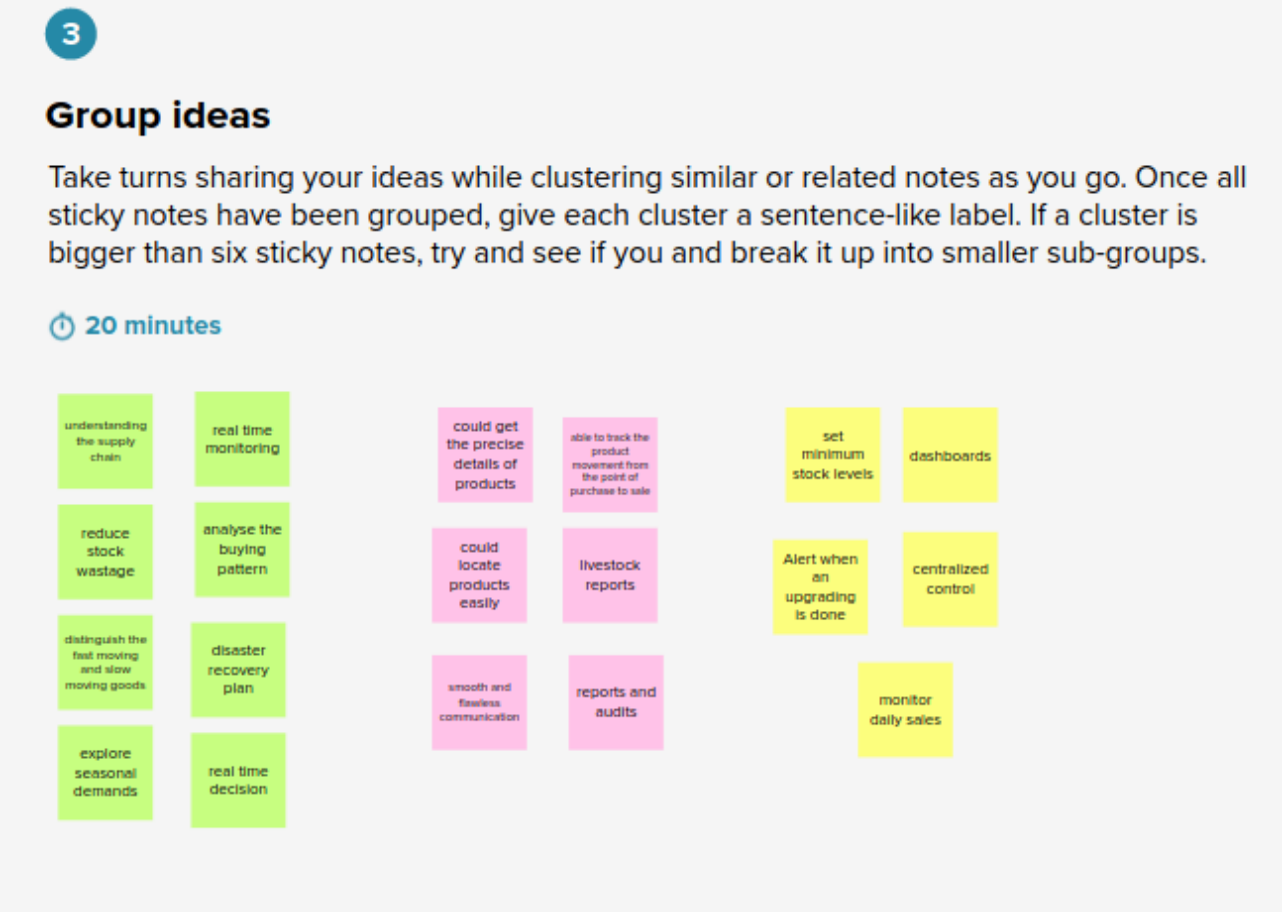
FR-5	Analysing stock patterns	Statistics display the pattern at which a certain stock is sold. Visualisation with graphs

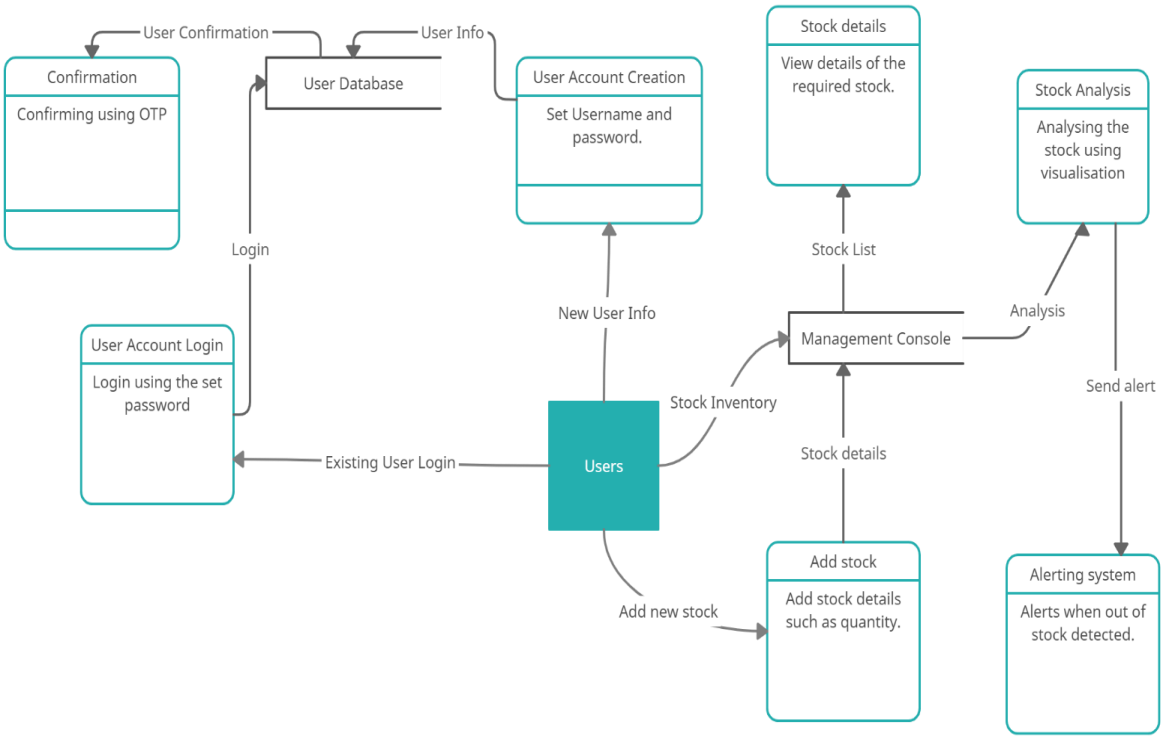
4.2 NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The application is user friendly for the users. The details of each stock are displayed clearly. It is easy to add a new stock into the inventory.
NFR-2	**Security**	Only the required users are allowed to view the stock details by creating an account. A login credential is allocated to the registered users.
NFR-3	**Reliability**	An alert is sent to the user through their registered email account when a shortage in a stock is detected. Stock analysis and visualisation is done to ensure better understanding of the stock.
NFR-4	**Performance**	Calculation of stock out, inactive stocks, lost sales, carrying cost of inventory and order cycle time are determined.
NFR-5	**Availability**	The application ensures that the stocks are available for customer orders. Demand forecasting makes sure that the out of stock is determined before hand for smooth business.
NFR-6	**Scalability**	The application can support many users without any delay or crash.

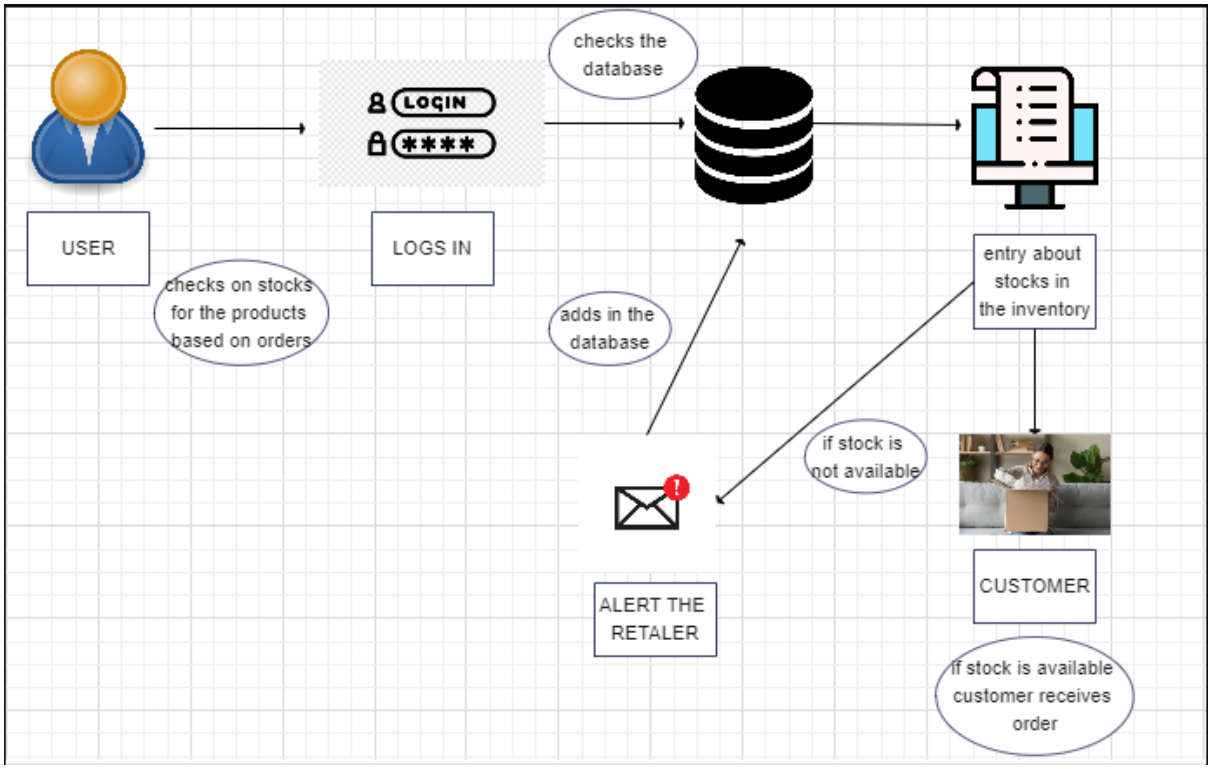
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS





5.2 SOLUTION AND TECHNICAL ARCHITECTURE



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	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 LinkedIn	I can register & access the dashboard with LinkedIn 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 add new stocks to the catalogue list. Also the stock details and features.	Once again confirming by entering PIN or password	High	Sprint-3
		USN-7	As a user, I can find/update any stock information.		Medium	Sprint-3
		USN-8	Inventory alert when any stock goes out of stock.	Users Gmail must be linked	High	Sprint-4

				inorder to send notification		
		USN-9	Inventory forecast and analysis to identify the sales of stock and predict the stocks which may get depleted before hand.		High	Sprint-4
		USN-10	Automatic reorder- an order request is sent to supplier with the default order when a stock becomes out of stock.	Default order quantity must be provided by the user for each stock.	Medium	Sprint-4

6. Project planning and scheduling:

6.1 Sprint planning & estimation:

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.	2	High	Sinduja P
Sprint-1	Registration	USN-2	As a user, I will receive confirmation email once I have registered for the application	3	High	Harshini Sivakami V
Sprint-2	Registration	USN-3	As a user, I can register for the application through Facebook	8	Low	Sinduja P
Sprint-1	Registration	USN-4	As a user, I can register for the application through Gmail	3	Medium	Snehapoorni K
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	5	High	Snehapoorni K
Sprint-2	Dashboard	USN-6	As a user, I can view the stock availability status	3	High	Harshini Sivakami V
Sprint-3	Dashboard	USN-7	As a user, I can view the orders status	3	Medium	Samyukta M
Sprint-4	Dashboard	USN-8	As a user, I can view the shipping tracking status	2	Medium	Samyukta M
Sprint-4	Alerts	USN-9	As a user, I should receive alerts on stock availability if it drops belows the set threshold	2	Medium	Harshini Sivakami V
Sprint-1	Registration	USN-10	As a user, I can register for the application by entering my email, password, and confirming my password.	3	High	Snehapoorni K

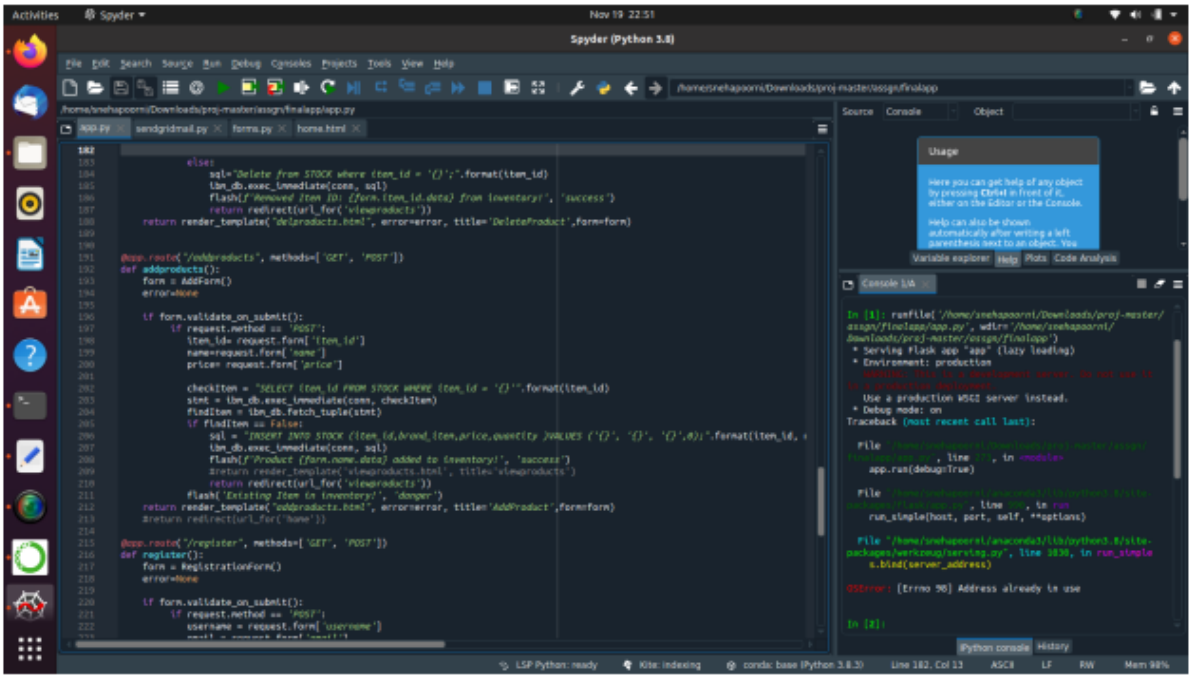
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	22	6 Days	24 Oct 2022	29 Oct 2022	22	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	19	6 Days	07 Nov 2022	12 Nov 2022	19	12 Nov 2022
Sprint-4	22	6 Days	14 Nov 2022	19 Nov 2022	22	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)

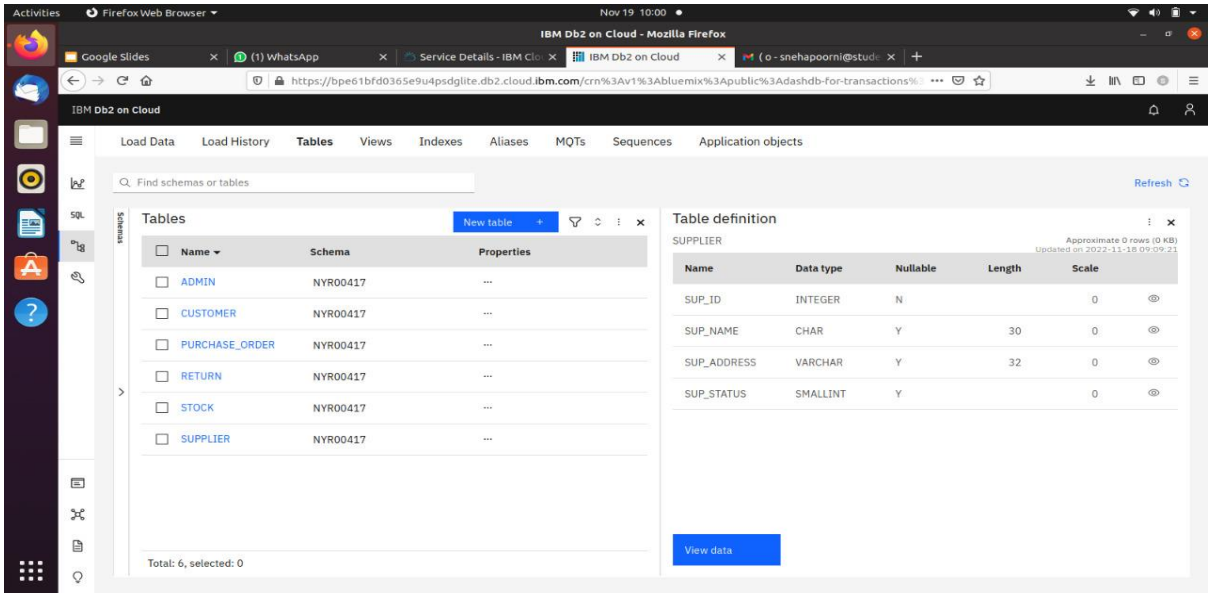
7. Coding and solutioning:

7.1 CODING

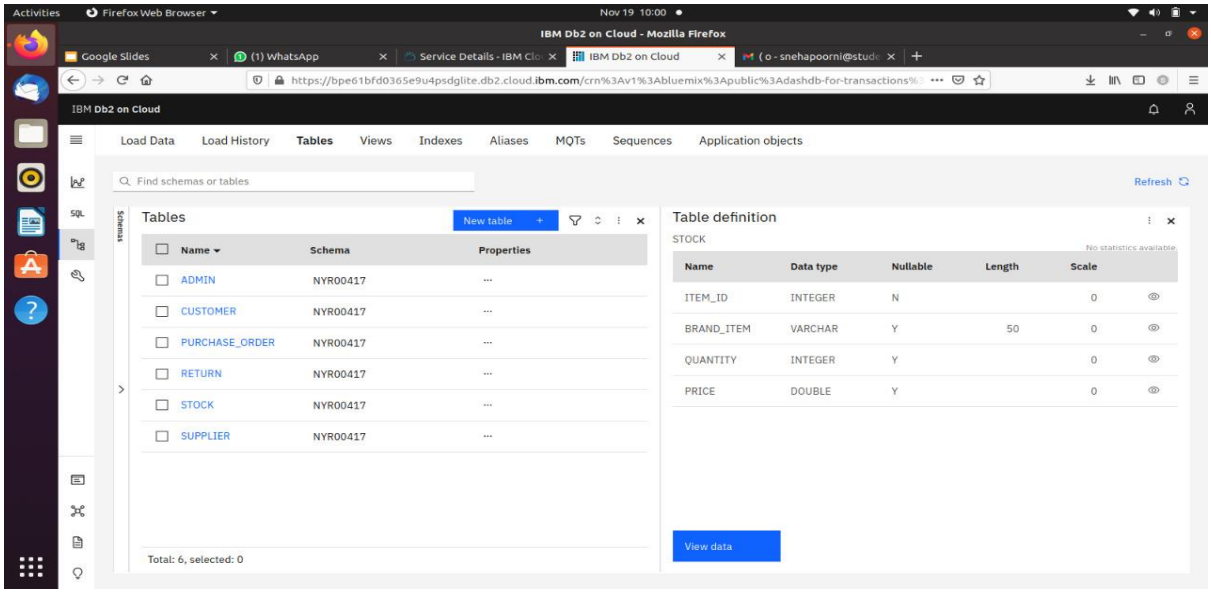


7.2 DATABASE SCHEMA

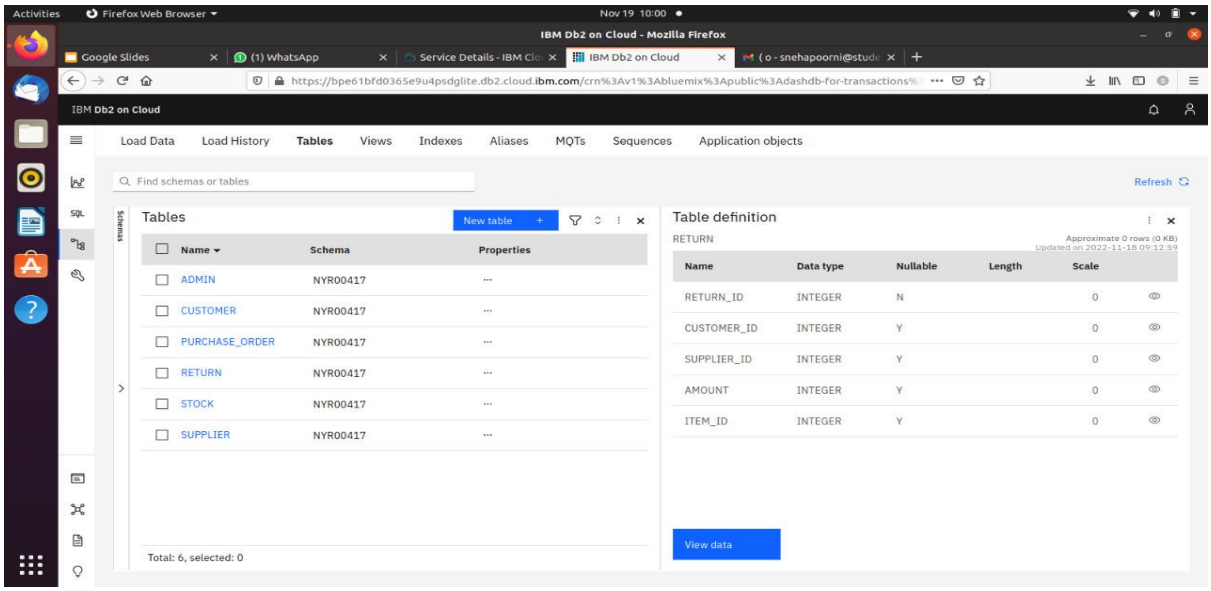
DB SCHEMA FOR SUPPLIER TABLE



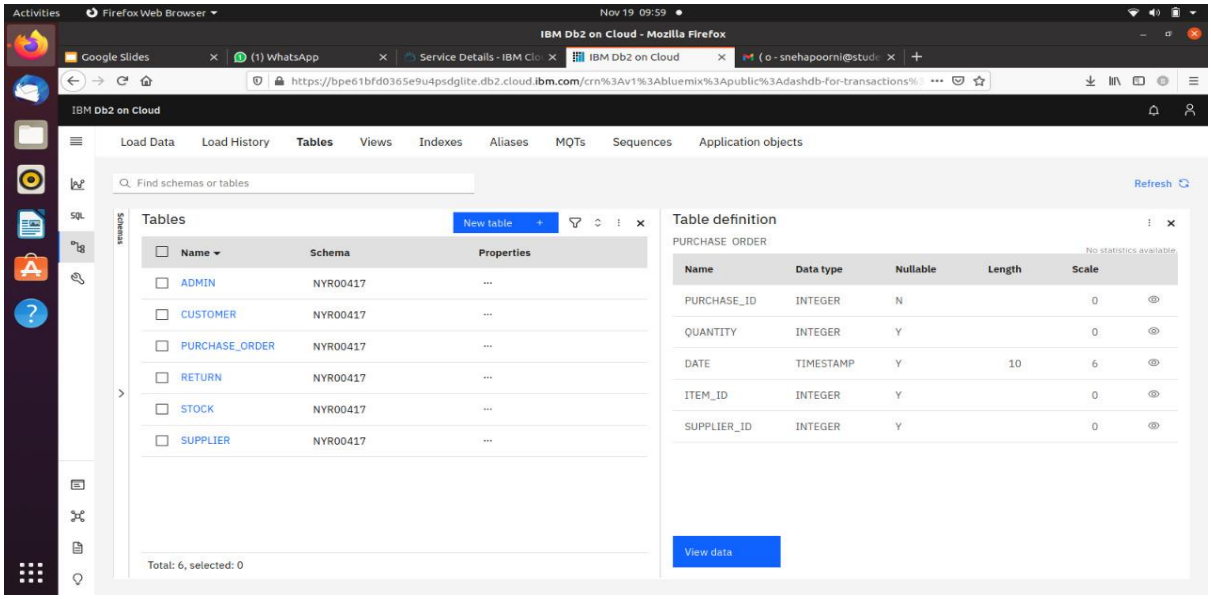
DB SCHEMA FOR STOCK TABLE



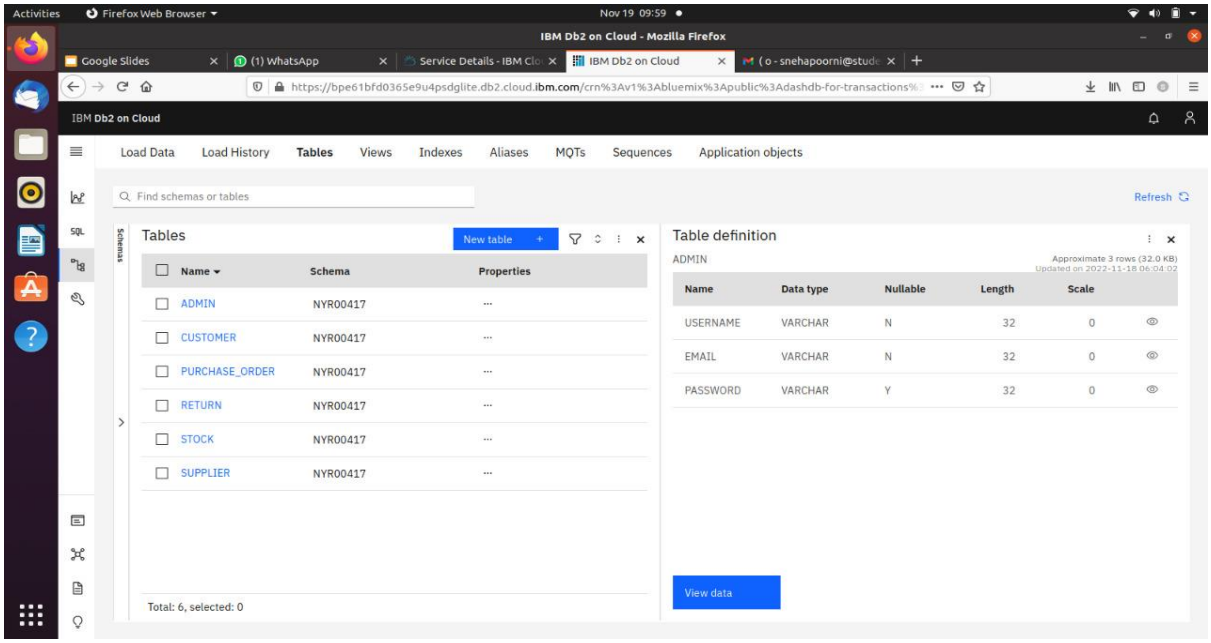
DB SCHEMA FOR RETURN TABLE



DB SCHEMA FOR PURCHASE ORDER

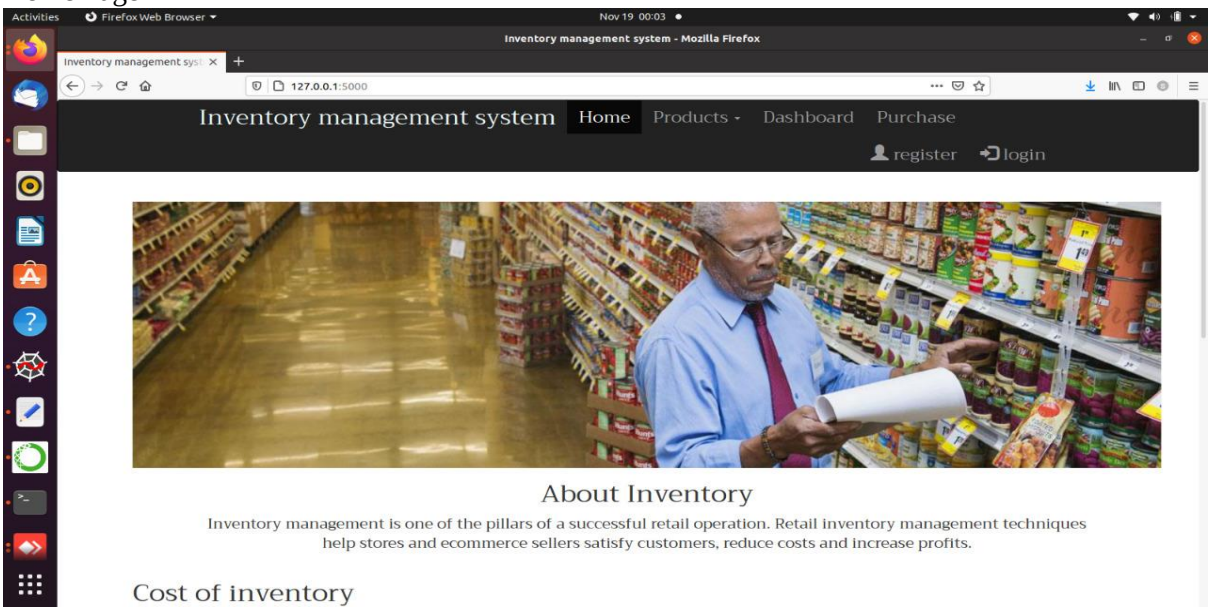


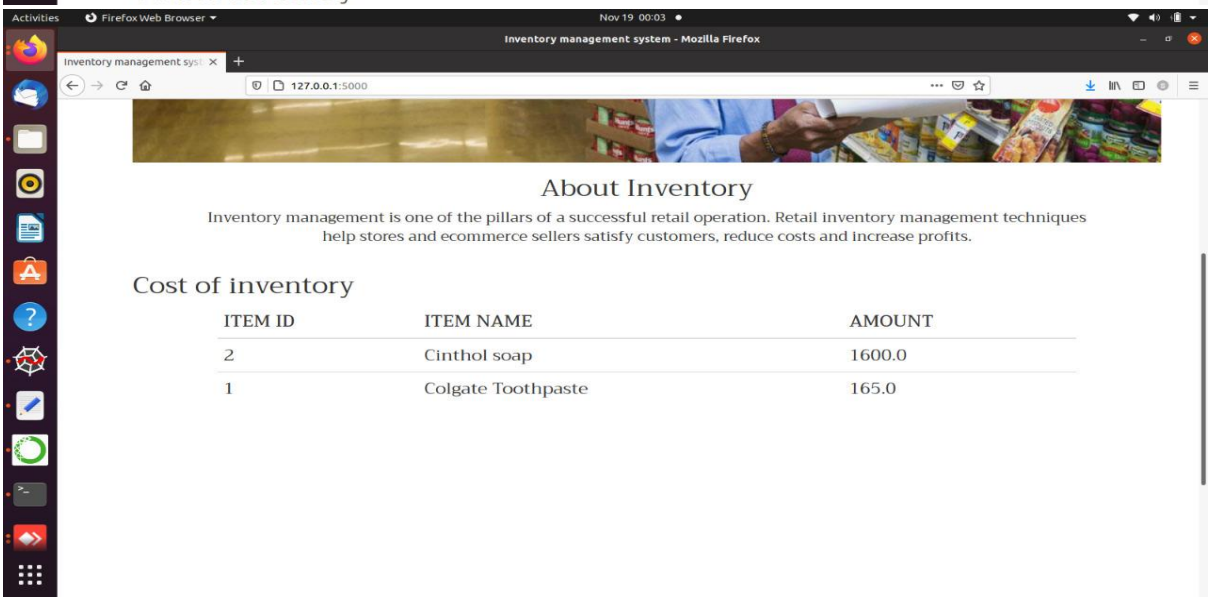
DB SCHEMA FOR ADMIN TABLE



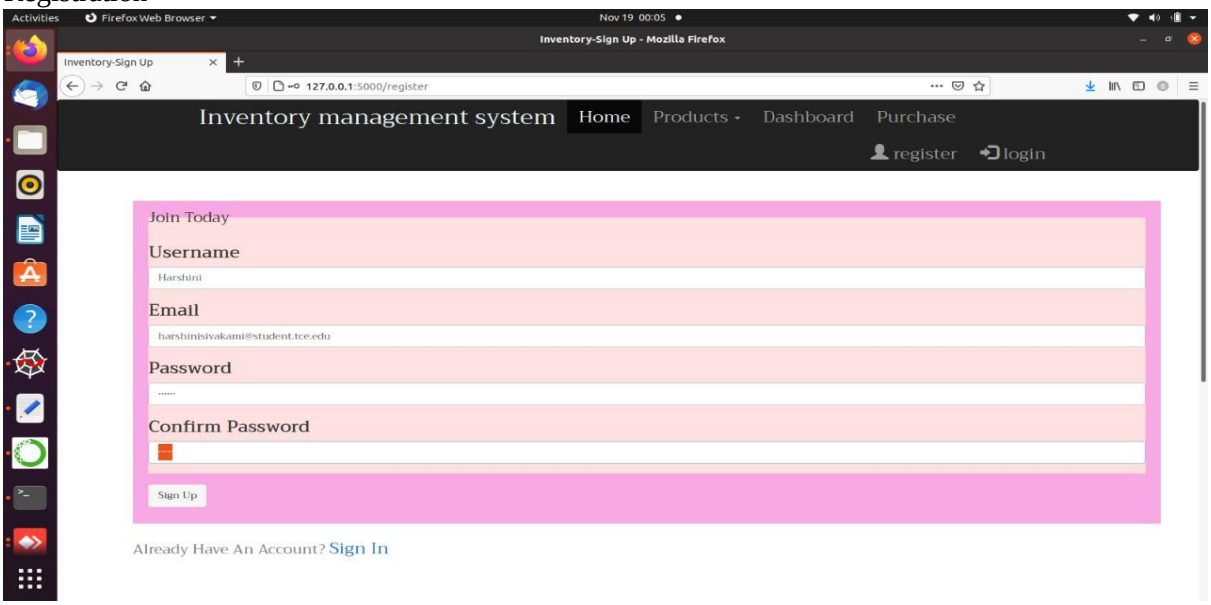
8. RESULT

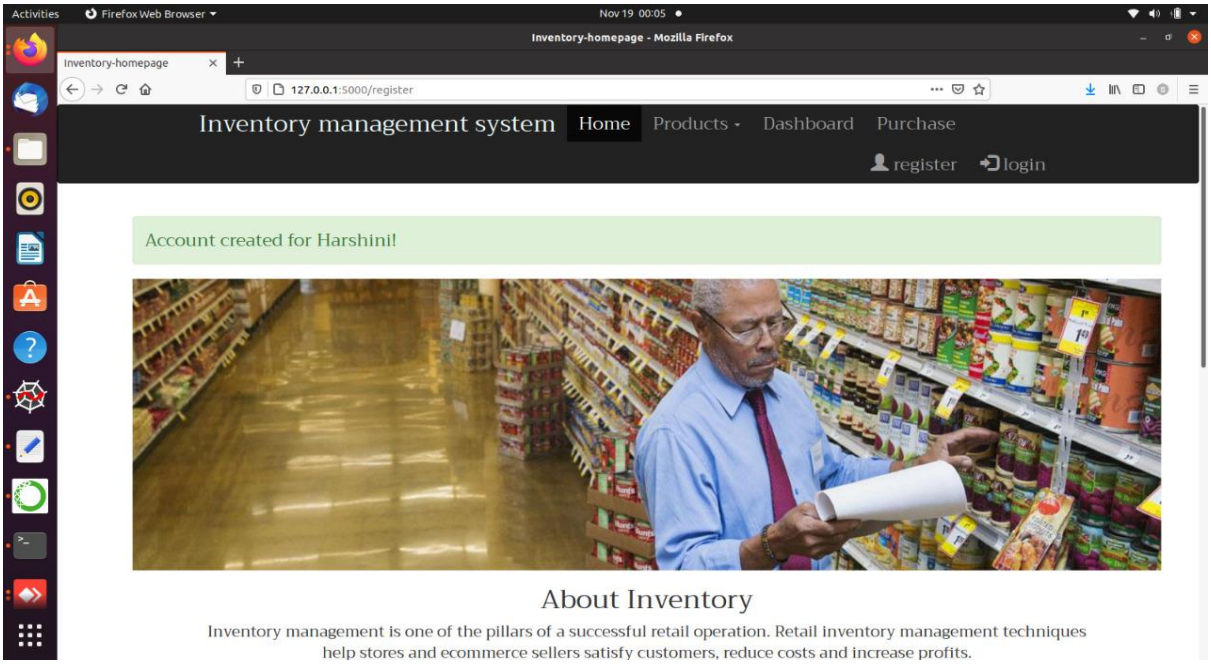
Home Page



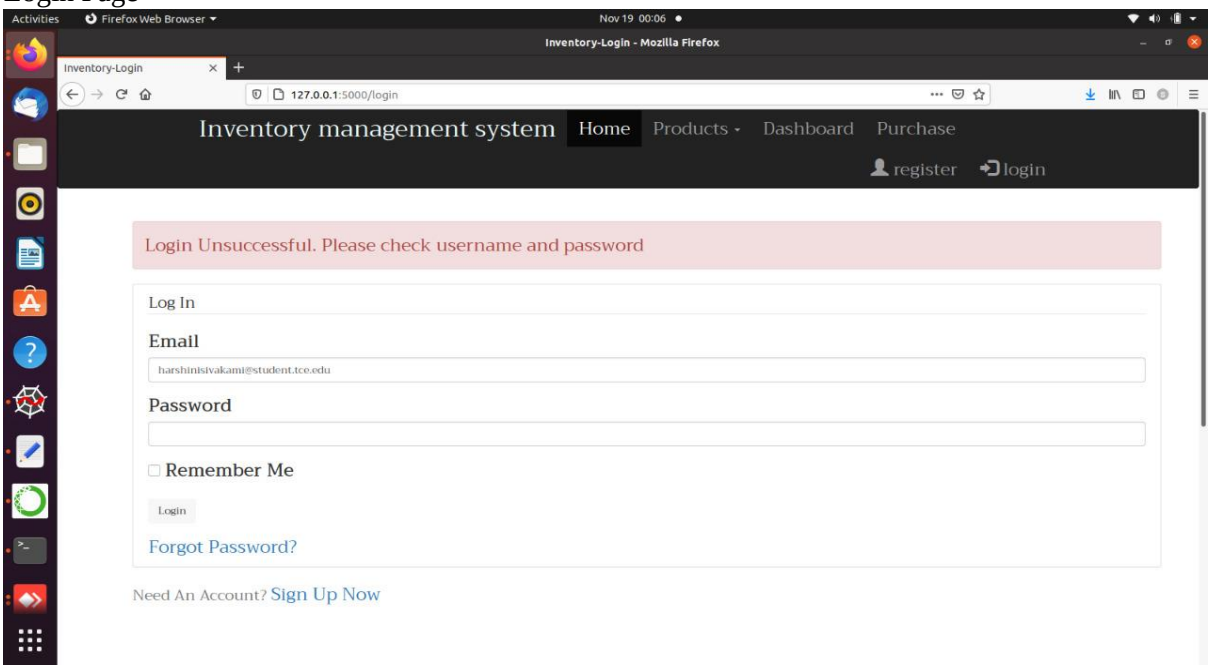


Registration




Activities
Firefox Web Browser
Nov 19 00:05
Inventory-homepage - Mozilla Firefox
Inventory-homepage
127.0.0.1:5000/register
Inventory management system
Home
Products
Dashboard
Purchase
register
login
Account created for Harshini!
About Inventory
Inventory management is one of the pillars of a successful retail operation. Retail inventory management techniques help stores and ecommerce sellers satisfy customers, reduce costs and increase profits.

Login Page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Products
Dashboard
Purchase
register
login
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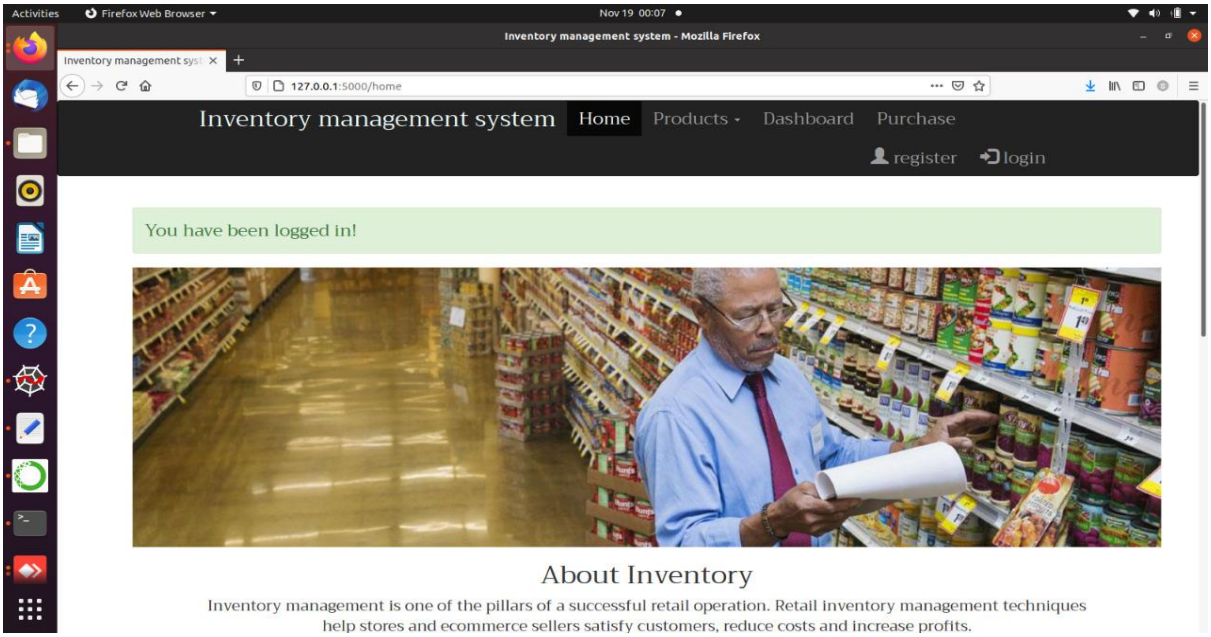
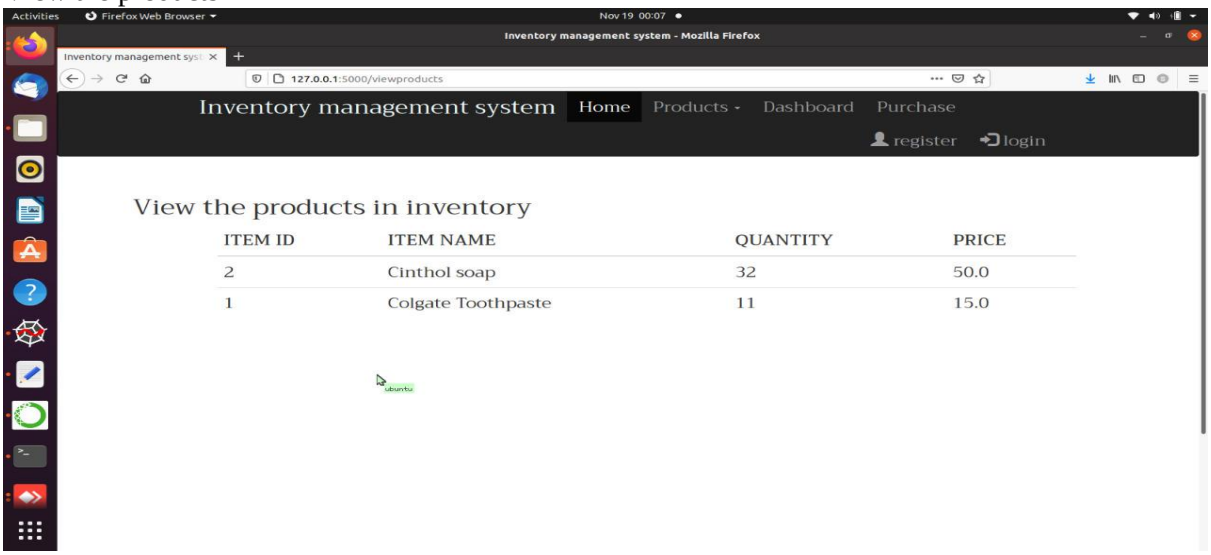
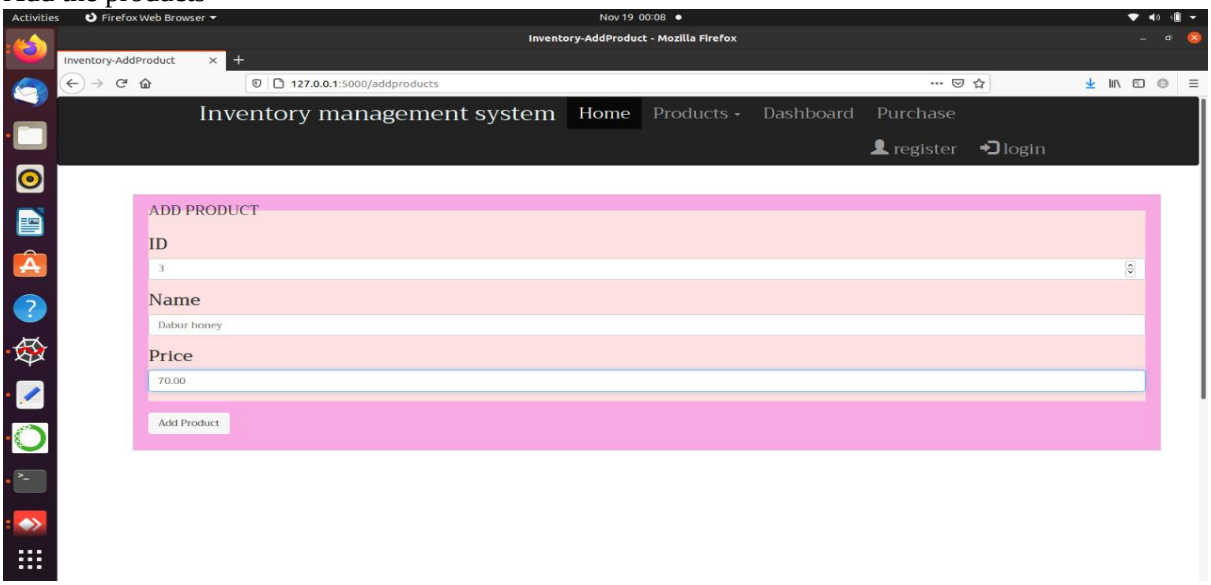
Log In
Email
harshinisivakami@student.tce.edu
Password
Remember Me
Login
Forgot Password?
Need An Account? Sign Up Now

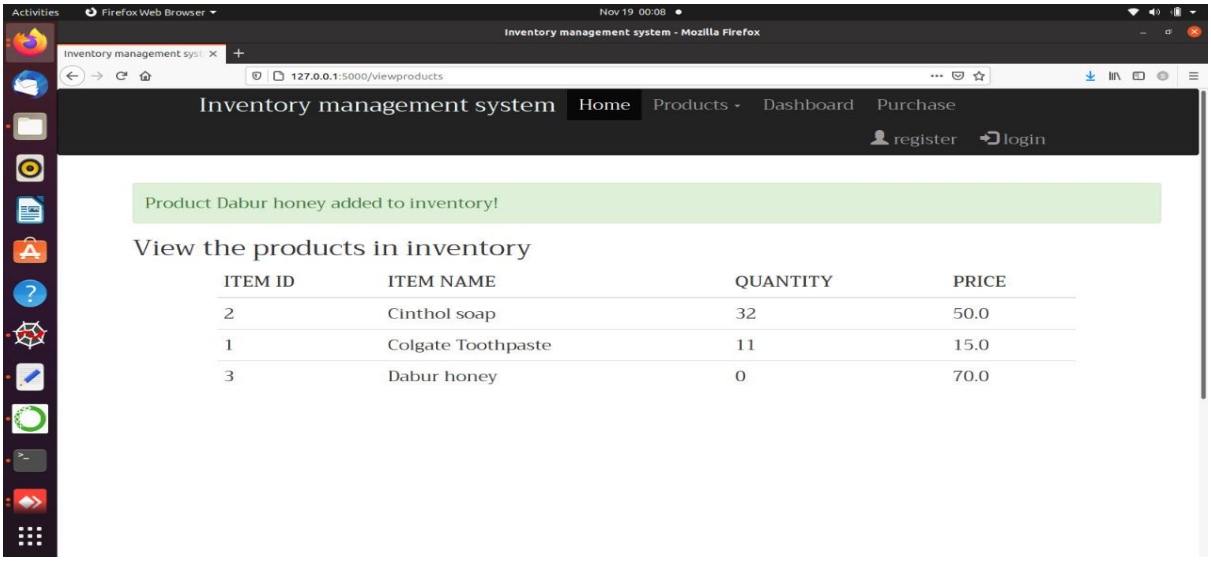


View the products

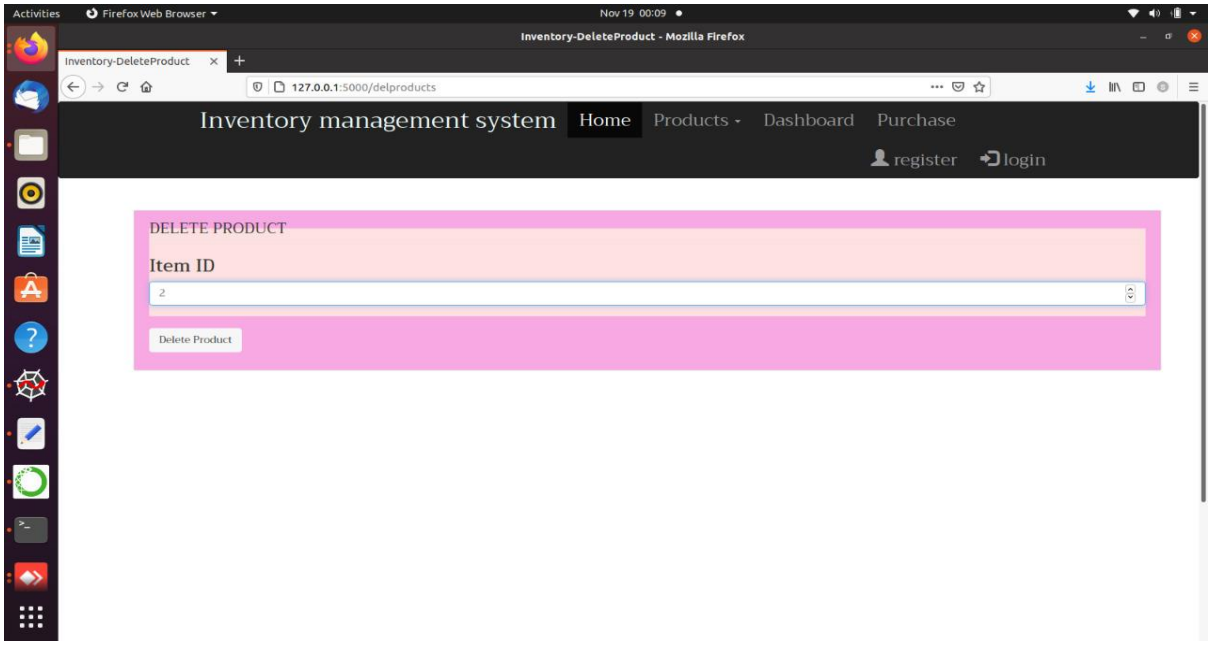


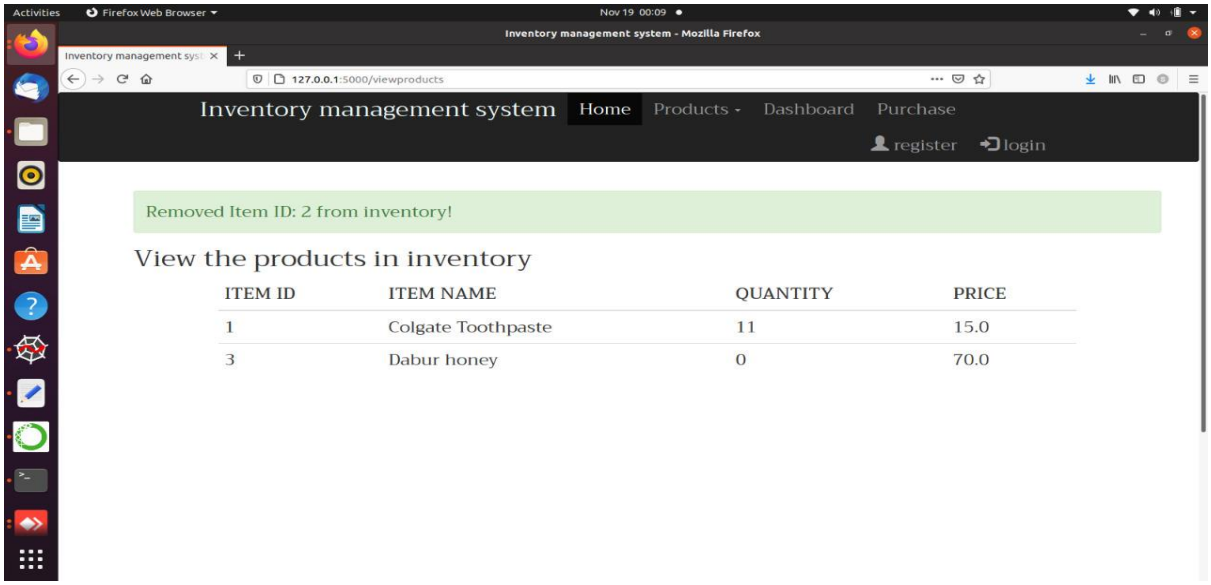
Add the products



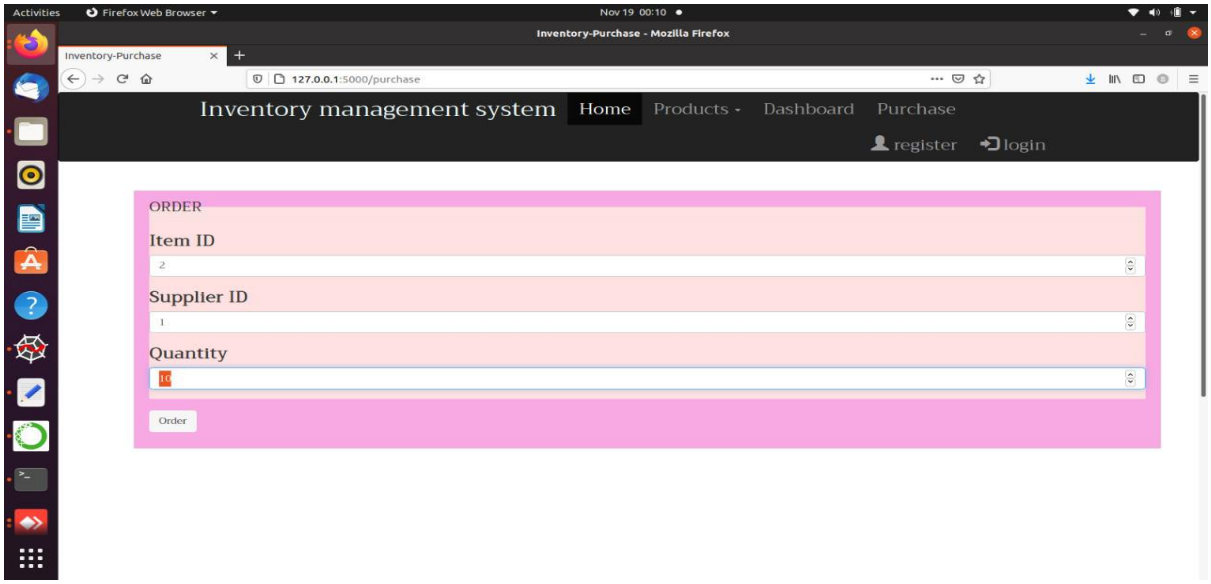


Remove the products

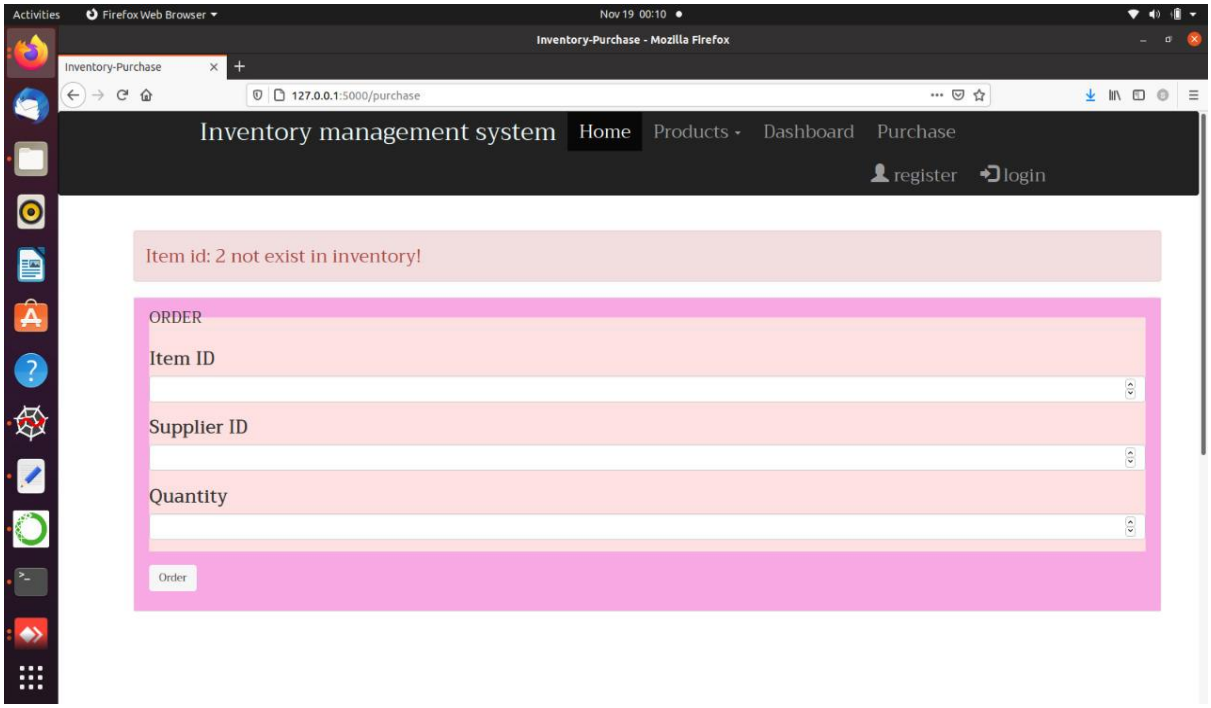




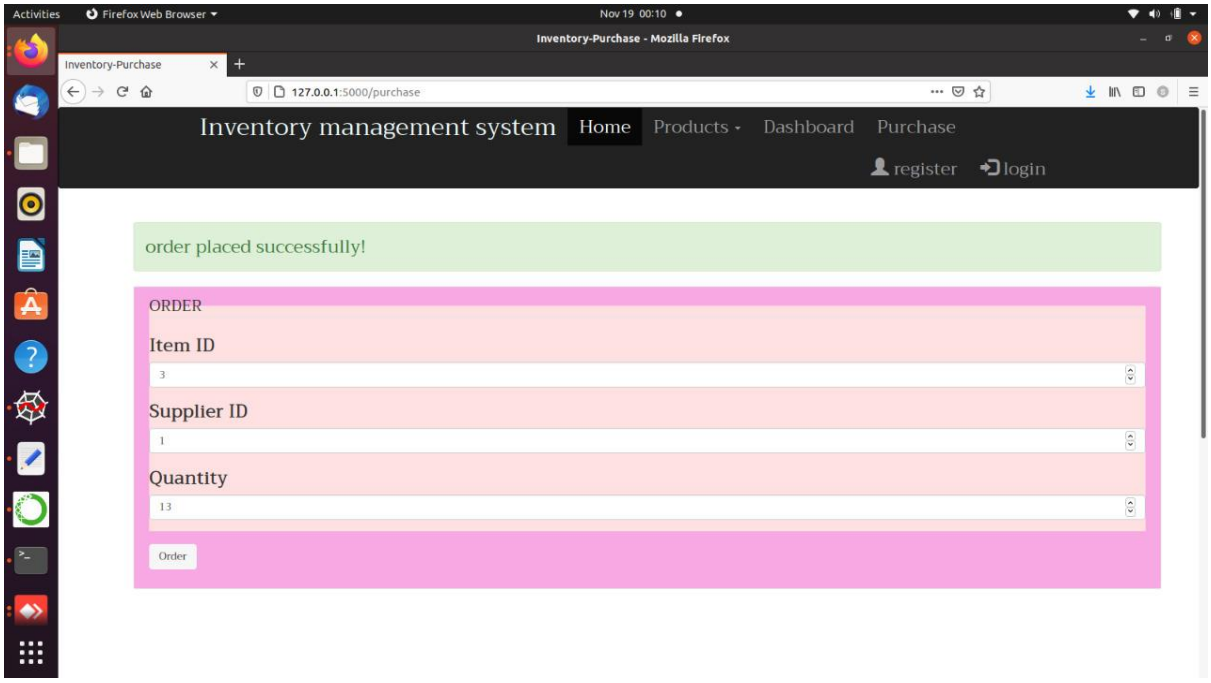
Placing order for non-existing item



Showing error for non existing item



Order Placed



9. ADVANTAGES & DISADVANTAGES

Advantages

- ***Speed***

  This website is fast and offers great accuracy as compared to manual registered keeping.

- ***Maintenance***

  Less maintenance is required

- ***User Friendly***

  It is very easy to use and understand. It is easily workable and accessible for everyone.

- ***Fast Results***

  It would help you to provide plasma donors easily depending upon the availability of it.

Disadvantages

- ***Internet***

  It would require an internet connection for the working of the website.

- ***Auto- Verification***

  It cannot automatically verify the genuine users.

10.CONCLUSION:

The strongest and the weakest point of this App is that it is completely user based. This app helps in adding , deleting stocks from the inventory management system for retailers by integrating the application into docker container.

11 .APPENDIX:

Github link:

https://github.com/IBM-EPBL/IBM-Project-26199-1660020927

Demo link:

https://docs.google.com/document/d/1b6m8Mzi7dPh2h1K4-2PBOr7ROlevpVh9fPRyqcTXrcc/edit?usp=sharing