

INVENTORY MANAGEMENT SYSTEM FOR RETAILERS

Team ID : PNT2022TMID04866

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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. 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.

1.2 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.

2. LITERATURE SURVEY

2.1 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.

2.2 References

S.NO	PAPER	AUTHOR	YEAR	METHOD AND ALGORITHM
1	Performance Improvement of Inventory Management System Processes by an Automated Warehouse Management System	Anas M.Atieh, Hazem Kaylani, YousefAl-abdallat Abeer Qaderi LumaGhoul LinaJaradat ImanHdairis	2016	This study investigates the impact of a warehouse management system on supply chain performance that provides less resources effort, more efficient, and reliable inventory management system. The supply chain procedures carried out in the warehouse were reviewed before customizing a software that can handle the necessary transactions. The software was tested for enhancing the work flow and providing a timely and efficient handling. Data was collected from the warehouse of a leading telecommunications service provider in Jordan. Furthermore, the facility layout was studied and we introduced a production station within the warehouse, which resulted in better space optimization/utilization of the warehouse. The production station consists of three steps: bundling, labelling, and repackaging. The system handles three phases of product lifecycle: receiving, processing, and distribution of SIM and prepaid scratch cards. Each phase of the product lifecycle was discussed in detail and the process/procedure gaps were identified. This work can serve both as a practical guide and industrial example for some researchers to compare the software inventory management system with the traditional manual system in the telecommunications sector in Jordan. It also highlights the gap between theory and practice; to motivate researchers to develop and customize new systems for mitigating supply chain disruptions.
2	A Study of Inventory Management	Tariq Sheakh	2018	Inventory management is a challenging problem area in supply chain management. Companies need to have inventories in warehouses in order to fulfil customer

	System Case Study			<p>demand, meanwhile these inventories have holding costs and this is frozen fund that can be lost. Therefore, the task of inventory management is to find the quantity of inventories that will fulfil the demand, avoiding overstocks. This paper presents a case study for the steel manufacturing industry (Small Scale Industry) on inventory management. The relationship between the inventory management and company performance was determined based on inventory days and return on asset (ROA) analysis. The research found that company X had a few inventory problems such as unorganized inventory arrangement, large amount of inventory days / no cycle counting and no accurate records balance due to unskilled workers. The study also proved that there was a significant relationship between return on asset (ROA) and inventory days. This paper also provides recommendation to the company and for further research</p>
3	Research paper on Inventory management system	Punam Khobragade* , Roshni Selokar* , Rina Maraskolhe* Prof.Manjusha Talmale	2018	<p>Inventory Management System is software which is helpful for the businesses operate hardware stores, where storeowner keeps the records of sales and purchase. Mismanaged inventory means disappointed customers, too much cash tied up in warehouses and slower sales. This project eliminates the paper work, human faults, manual delay and speed up process. Inventory Management System will have the ability to track sales and available inventory, tells a storeowner when it's time to reorder and how much to purchase. Inventory Management System is a windows application developed for Windows operating systems which focused in the area of Inventory control and generates the various required reports.</p>
4	A Review of Inventory Management System	Varalakshmi G S1 , Asst Prof. Shivaleela S2	2021	<p>Inventory Management System is extremely beneficial to business owners, as they allow shops to properly store sales and purchase records. When inventory is mismanaged, it leads to dissatisfied consumers, slower sales, too much cash on hand, and warehouses. This inventory system reduces manual work, human mistake, and manual delays while simultaneously speeding up the process. This inventory management system will be able to track sales information as well as inventories. Inventory management system is a web application for Windows that focuses on inventory and sales clearance. It was created for Windows operating systems. The inventory management system has a number of features. This web application has logical tools for evaluating ideal inventory levels and selecting the appropriate replenishment strategies automatically. It also has capabilities like the ability to identify stock levels, compute reorder points automatically, and highlight potential stock-outs. This technique eliminates the risk of</p>

				stock-outs of fast-moving goods by minimizing delays
5	A Study of Inventory Management System of Linamar India Pvt. Ltd, Pune	Anajali Mishra & Harshal Anil Salunkhe	2018	The aim of the study is to examine the inventory management process. The significance of this research is based on the benefits that can be obtained by identifying the issues of inventory control. The methodology used are unstructured interviews, on-site study, and annual report analysis. Inventory management is an important area of manufacturing industry. If company fails to manage inventory, they will face failure. It is a challenge for the company to maintain fair inventory. There are various inventory management techniques available for maintaining fair inventory level in the company. The basic objective of this paper is to study about inventory management techniques used in Linamar India Pvt. Ltd. and find out some measures for improvement on inventory management process of the concerned company. The present system of inventory management of the company is good. For improvement of the present inventory management system, company should adopt other inventory management techniques

2.3 Problem Statement Definition

Create a problem statement to understand your customer's point of view. The Customer Problem Statement template helps you focus on what matters to create experiences people will love.

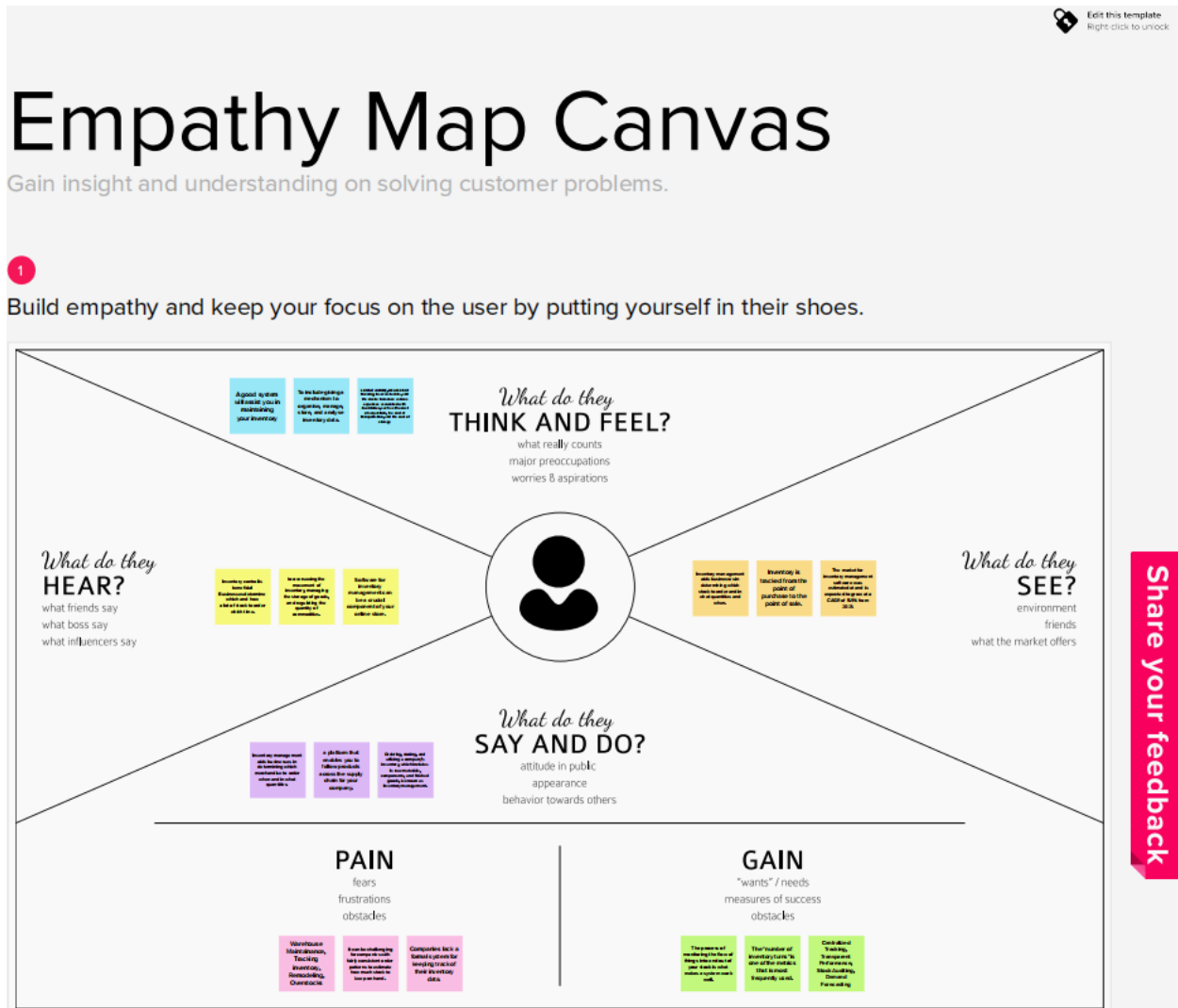
A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

I am	Describe customer with 3-4 key characteristics - <i>who are they?</i>	Describe the customer and their attributes here
I'm trying to	List their outcome or "job" the care about - <i>what are they trying to achieve?</i>	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way - <i>what bothers them most?</i>	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists - <i>what needs to be solved?</i>	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view - <i>how does it impact them emotionally?</i>	Describe the emotions the result from experiencing the problems or barriers

I am Retailer	I'm trying to Monitor stock levels & avoid out-of stock situations	but Is time consuming, redundant and vulnerable to errors	Because Using manual inventory tracking procedures across different software and spreadsheets	Which makes me feel Frustrated miro
I am Warehouse supervisor	I'm trying to Track items in real time as they are received, stored, picked, packed and shipped	but Advises on inventory replenishment	Because Guides inventory receiving and put away	Which makes me feel Tired & stressed miro
I am Retailer	I'm trying to Organize stock, manage purpose and sale detail	but Lot of time and space consuming	Because I need to organize the stock, purchase details, sale details and maintain the inventory model	Which makes me feel Better relief and happy miro


3. IDEATHON & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 Ideation & Brainstormin

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
- 2-8 people is recommended

[Share template feedback](#)

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

- Team get-together**
Define who should participate in the session and send them in advance. Share relevant information or pre-work ahead.
- Set the goal**
Think about the problem you'll be focusing on during the brainstorming session.
- Learn how to use the facilitator's role**
Use the Facilitator's Prep work to have happy and productive sessions.

[Open article](#)

1

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

Need to manage the club's debt, purchase drinks, and maintain the shop.

Key rules of brainstorming

Focus on quantity and production, not quality.

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Likewise others.
- Generate volume.
- Yes, and, for ideas.

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 then press down on it to share it with the group.

SARVADA ANNAMALAI	SANJAY	SANTOSH	SAN THIO BI KUMAR
1. How can we reduce the club's debt?	1. How can we reduce the club's debt?	1. How can we reduce the club's debt?	1. How can we reduce the club's debt?
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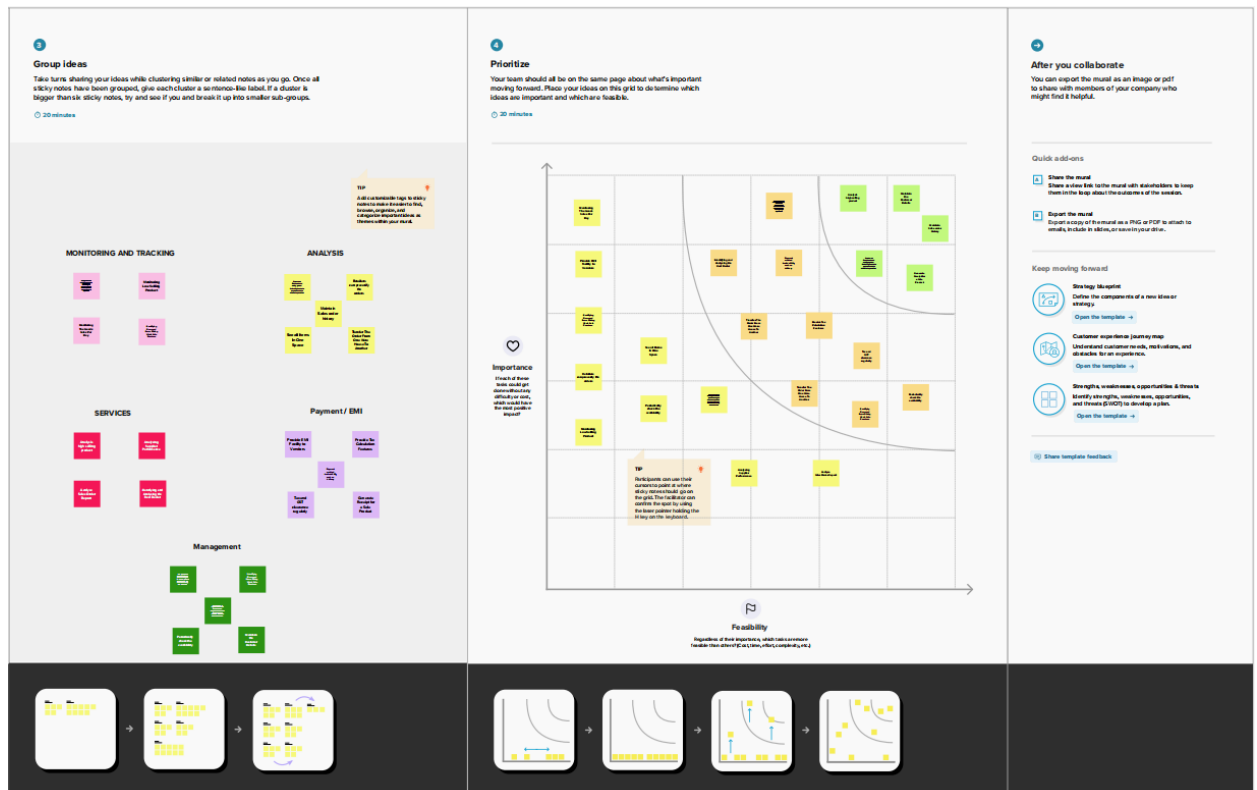
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[Open example](#)



3.3 Proposed Solution

S.NO	PARAMETER	DESCRIPTION
1	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"> The retailers generally facing issues in recording the stocks and its threshold limit available. The customers are not satisfied with the retailers store since it doesn't have enough supplements and the deliveries were not made on time.
2	Idea / Solution description	<ul style="list-style-type: none"> This proposed system will have a daily update system whenever a product is sold or it is renewed more. The product availability is tracked daily and an alert system in again kept on to indicate those products which falls below the threshold limit. All the customers can register their accounts after which they will be given a login credentials which they can use whenever

		<p>they feel like buying the stocks.</p> <ul style="list-style-type: none"> ● The application allows the customers to know all the present time available stocks and also when the new stock will be available on the store for them to buy.
3	Novelty / Uniqueness	<ul style="list-style-type: none"> ● Certain machine learning algorithms are used to predict the seasonal high selling products which can be made available during that time. ● Prediction of the best selling brand of all certain products based on their popularity, price and customer trust and satisfaction will be implemented. ● Notifications will be sent to the retailers if any product that the customers have been looking for is not available so that the product can be stocked up soon.
4	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> ● The customers will be highly satisfied since the wasting of time while searching for an unavailable product is reduced. ● The work load of the retailers will be minimized if the system is automated every day and during every purchase. ● The customer satisfaction will be improved for getting appropriate response from the retailers and that too immediately
5	Business Model (Revenue Model)	<ul style="list-style-type: none"> ● Hereby we can provide a robust and most reliable inventory management system by using: <ol style="list-style-type: none"> 1. ML algorithms for all the prediction purposes using all the past dataset since datasets are undoubtedly available in huge amounts. 2. Can deploy the most appropriate business advertising models. 3. To establish a loss preventing strategy. 4. And to ensure the all time, any where availability of products system.

6	Scalability of the Solution	<ul style="list-style-type: none"> • Implementation of anyone and anywhere using system can be helpful for even a commoner to buy the products. • Daily and Each time purchase updation of the stock for preventing inventory shrinkage
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3.4 Problem Solution Fit :

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why

Purpose:

1. Solve complex problems in a way that fits the state of your customers.
2. Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
3. Sharpen your communication and marketing strategy with the right triggers and messaging.
4. Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
5. Understand the existing situation in order to improve it for your target group.

Problem-Solution fit canvas 2.0

Purpose / Vision : To help the retailers in managing their stocks

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS <p>Our proposed model targets the distributors, wholesalers, manufacturers and retailers to track their stocks.</p>	6. CUSTOMER CONSTRAINTS CC <p>Too much stock on hand can be just as hazardous as not enough. Overstock negatively affects a company's cash flow and causes issues with storage and loss of inventory. Also doesn't come to know about the stocks which is to be short.</p>	5. AVAILABLE SOLUTIONS AS <p>It is laborious and unsafe to manage inventory with paperwork and manual procedures. Additionally, scaling across several warehouses with a lot of goods is difficult. Provide workers with the appropriate inventory tools for the job. Software is required to replace manual inventory tracking, and purchase orders and invoices must be processed without the use of paper.</p>	Explore AS, differentiate	
	2. JOBS-TO-BE-DONE / PROBLEMS J&P <p>The problem faced by them is that it is difficult to manage the large amount of inventory data. They have maintain the hardcopy of the inventory, it is difficult to organize properly. Pen and paper work is too tedious.</p>	9. PROBLEM ROOT CAUSE RC <p>Difficulty in managing the large amount of stocks using pen and paper and struggles in managing the stocks data without centralized data storage.</p>	7. BEHAVIOUR BE <p>It is time-consuming, redundant, and prone to errors to use manual inventory tracking techniques across various programmes and spreadsheets. An integrated central inventory management system with accounting capabilities might be helpful for even small retailers.</p>		Focus on J&P, map int C
	3. TRIGGERS TR <p>This inventory management method will inspire distributors, retailers who own markets or wholesale enterprises by making them to handle the data easily.</p>	10. YOUR SOLUTION SL <p>Our aim is to design the inventory management system to increase the scalability of the retailers business with the help of automated inventory management system and also aim to save the time. The customer can able to track the sold stocks and availability of stocks. They get notified when the stock is about to end.</p>	8. CHANNELS of BEHAVIOUR CH <p>8.1 ONLINE Collecting information from various websites and utilise it efficiently.</p> <p>8.2 OFFLINE Collecting feedbacks to improve the efficiency of the system.</p>		
4. EMOTIONS: BEFORE / AFTER EM <p>Before: Depressed, Worn out of managing stocks. After : Stress less, Enthusiastic in works.</p>					

Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license
Created by Denia Negralkhina / Amaltama.com

AMALTAMA

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

- i. Inventory Management
- ii. Inventory Tracking
- iii. Transfer Management
- iv. Purchasing
- v. Shipping
- vi. Reporting & Analytics

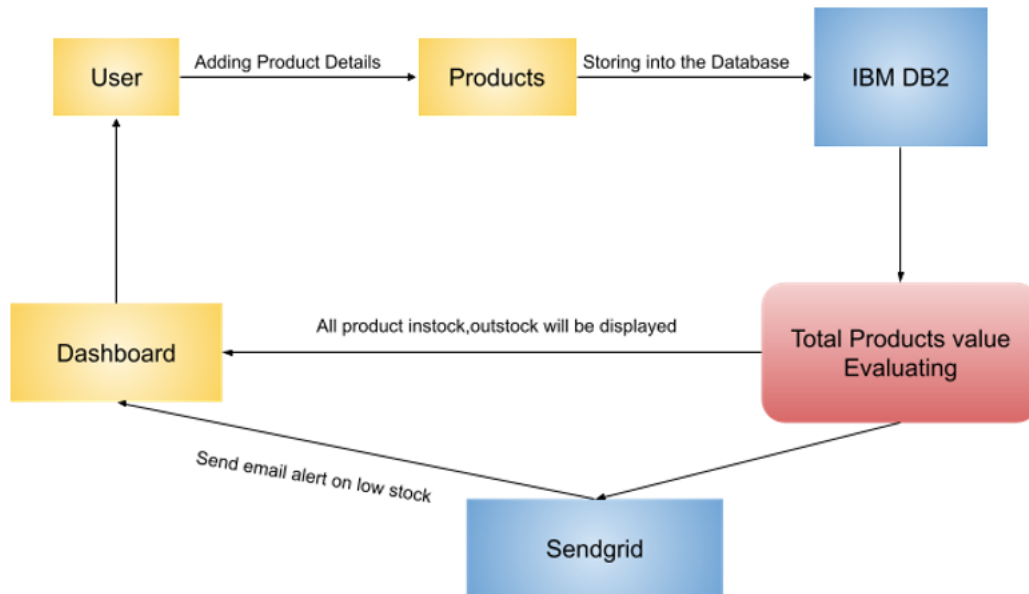
vii. Deployment

4.2 Non-Functional requirements

1. Performance
2. Scalability
3. Portability
4. Compatibility
5. Reliability
6. Availability
7. Maintainability
8. Security
9. Localization
10. Usability

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAM



5.2 SOLUTION & TECHICAL ARCHITECTURE

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

1. Find the best tech solution to solve existing business problems.
2. Describe the structure, characteristics, behavior, and other aspects of the software to projects take holders.

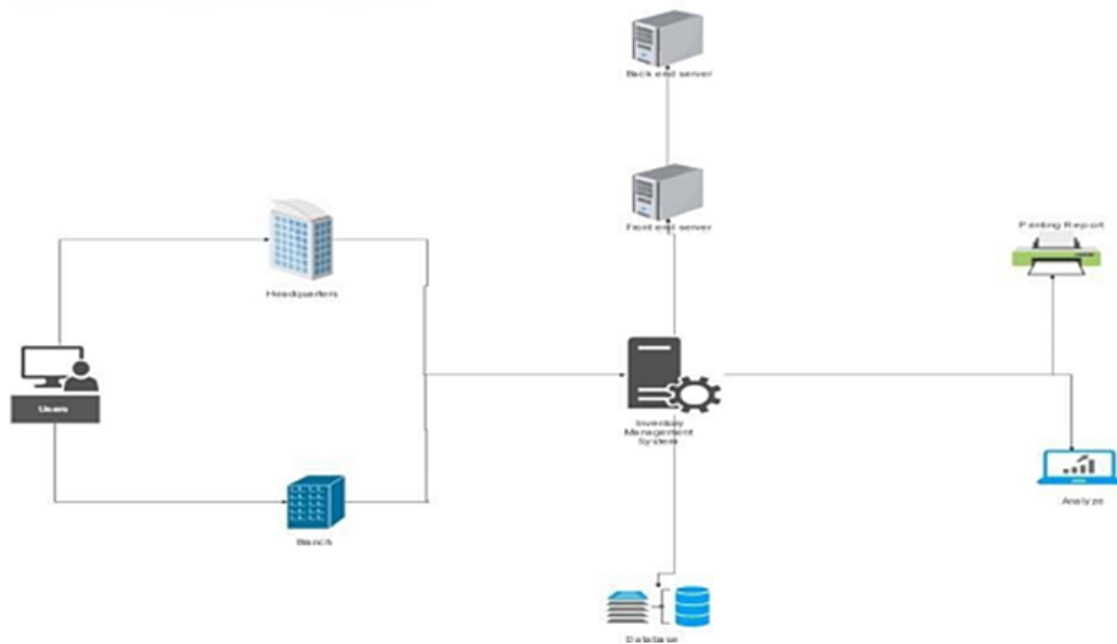
DESIGN:

1. Sending message automatically when an item in an inventory runs out.
2. Detection of out-of-stock items.
3. Overflowing items in inventory.

SOFTWARE AND SYSTEM REQUIRED:

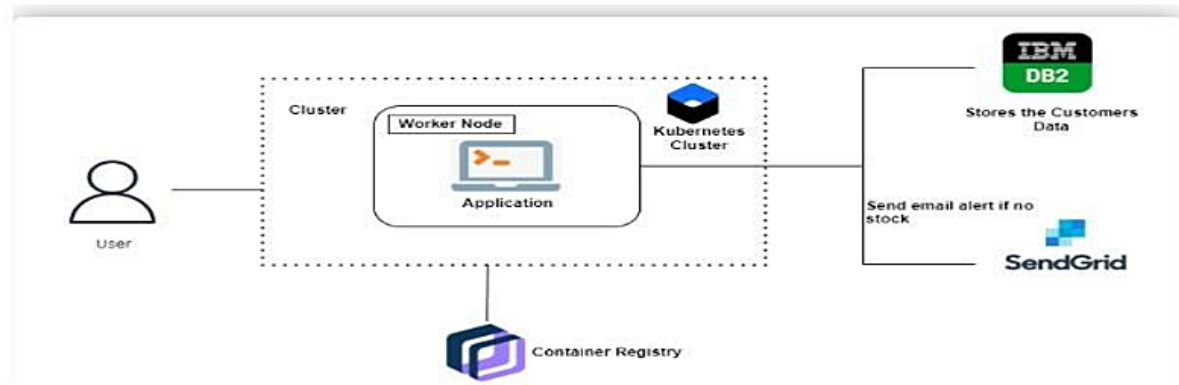
- i. Python
- ii. Flask
- iii. Docker
- iv. 8GB RAM, Intel Core i3
- v. OS-Windows/Linux/Max
- vi. Laptop or Desktop

DIAGRAM:



TECHNICAL ARCHITECTURE:

Technical Architecture:



COMPONENT AND TECHNOLOGIES:

S.NO	COMPONENT	DESCRIPTION	TECHNOLOGY
1	User interface	How to user interacts with application ,EX.Mobile app,Chatbot	HTML,CSS,Python,Mysql,Flask
2	Application logic-1	Logic for a process in the application	Python
3	Application logic-2	Logic for a process in the applicatipon	SendGrid
4	Application logic-3	Logic for a process in the application	IBM Watson Application
5	Database	Data type, configuration ect.	MySQL
6	Cloud database	Database service on cloud	IBM DB2.IBM cloud
7	File storage	File storage requirement	IBM object storage

Application Characteristics:

S.NO	CHARACTERISTICS	DESCRIPTION	TECHNOLOGY
1	Open-source framework	Microwave framework written in python	Flask
2	Security implementation	A set of cryptographic hash function	SHA-256
3	Scalable Architecture	Kubernetes is a open source container orchestration system for automating software deployment,scalling and management	Kubernetes
4	Availability	To customize setting for the docker CLI. The configuration file uses JSON formatting	Docker CLI
5	Performance	The performance will be high because there will be no network traffics in the application	Kubernetes is cluster

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Retailer(Web User)	Registration	USN – 1	As a user, I can register for the application by entering my email, password, and confirming my password.	I will be redirected to login page	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-2
		USN – 4	As a user, I can register for the application through Gmail	I can verify the OTP number	Medium	Sprint-1
	Login	USN – 5	As a user, I can log into the application by entering email & password	I can access my account / dashboard	High	Sprint-1
	Dashboard	USN – 6	As a user,I can update stock in & out count details	Updation can be made through barcode scanning	High	Sprint-2
	Dashboard	USN – 7	As a user,I can check the low stock details through alert message	Alert message can be received by registered mail	High	Sprint-1
		USN – 8	As a user,I can check the total product details	I can view the value of total products in the stock	Medium	Sprint-2
		USN – 9	As a user,I can check the high demand product details	I can update sales details of the products	High	Sprint-2
		USN - 10	As a user,I can generate the invoice details	I can add incoming stock details	High	Sprint-1

6.PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirment(Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
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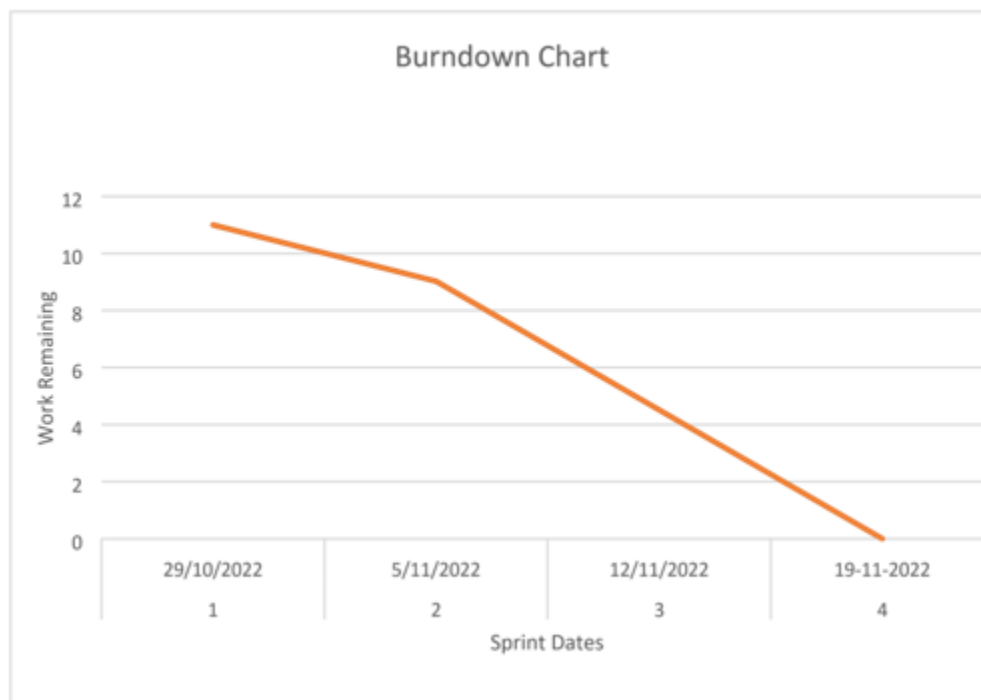
Sprint-1	Registration	USN-1	As a user, I can register for the application by using my email & password and confirming my login credentials.	3	High	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-1		USN-2	As a user, I can login through my E-mail.	3	Medium	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-1	Confirmation	USN-3	As a user, I can receive my confirmation email once I have registered for the application	2	High	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-1	Login	USN-4	As a user, I can log in to the authorized account by entering the registered email and password.	3	Medium	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-2	Dashboard	USN-5	As a user, I can view the products that are available currently.	4	High	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-2	Stocks Update	USN-6	As a user, I can add products which are not available in the inventory and restock the products	3	Medium	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-3	Sales Prediction	USN-7	As a user, I can get access to sales prediction tool which can help me to predict better restock management of product.	6	Medium	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
Sprint-4	Request for Customer Care	USN-8	As a user, I am able to request customer care to get in touch with the administrators and enquire the doubts and problems.	4	Medium	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar

Sprint-4	Giving Feedback	USN-9	As a user, I am able to send feedback forms reporting any ideas for improving or resolving any issues I am facing to get it resolved	3	Medium	Sankara Annamalai, Sanjai, Santhosh, Santhosh Kumar
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6.2 Sprint Delivery Schedule

Sprint	Total Story Point	Duration	Sprint Start Date	Sprint End Date	Story Points Completed	Sprint Release Date
Sprint-1	11	6 days	24 Oct 2022	29 Oct 2022	11	29 Oct 2022
Sprint-2	7	6 days	31 Oct 2022	05 Nov 2022	7	05 Nov 2022
Sprint-3	6	6 days	07 Nov 2022	12 Nov 2022	6	12 Nov 2022
Sprint-4	7	6 days	10 Nov 2022	19 Nov 2022	7	19 Nov 2022

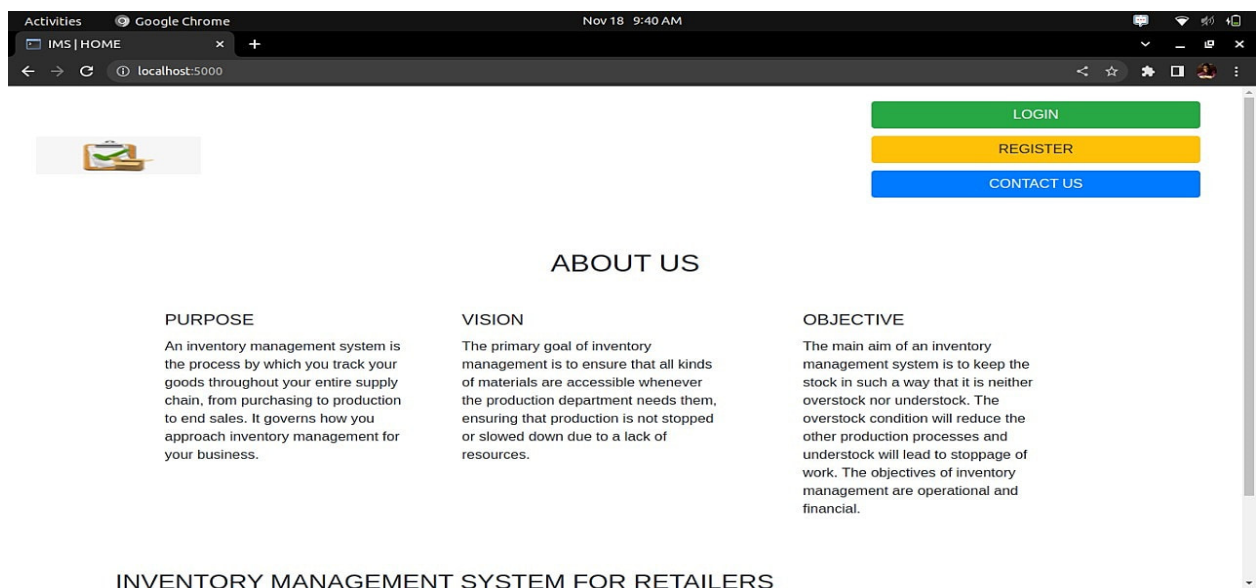
6.3 Reports from JIRA



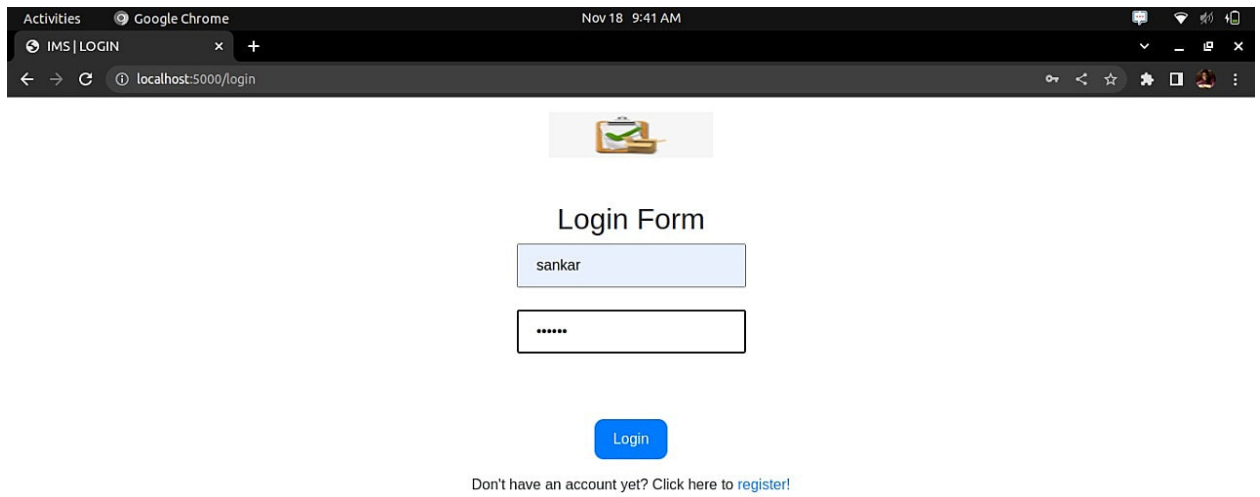
7. CODING & SOLUTIONING (Explain the features added in the project along with code)

7.1 Feature 1

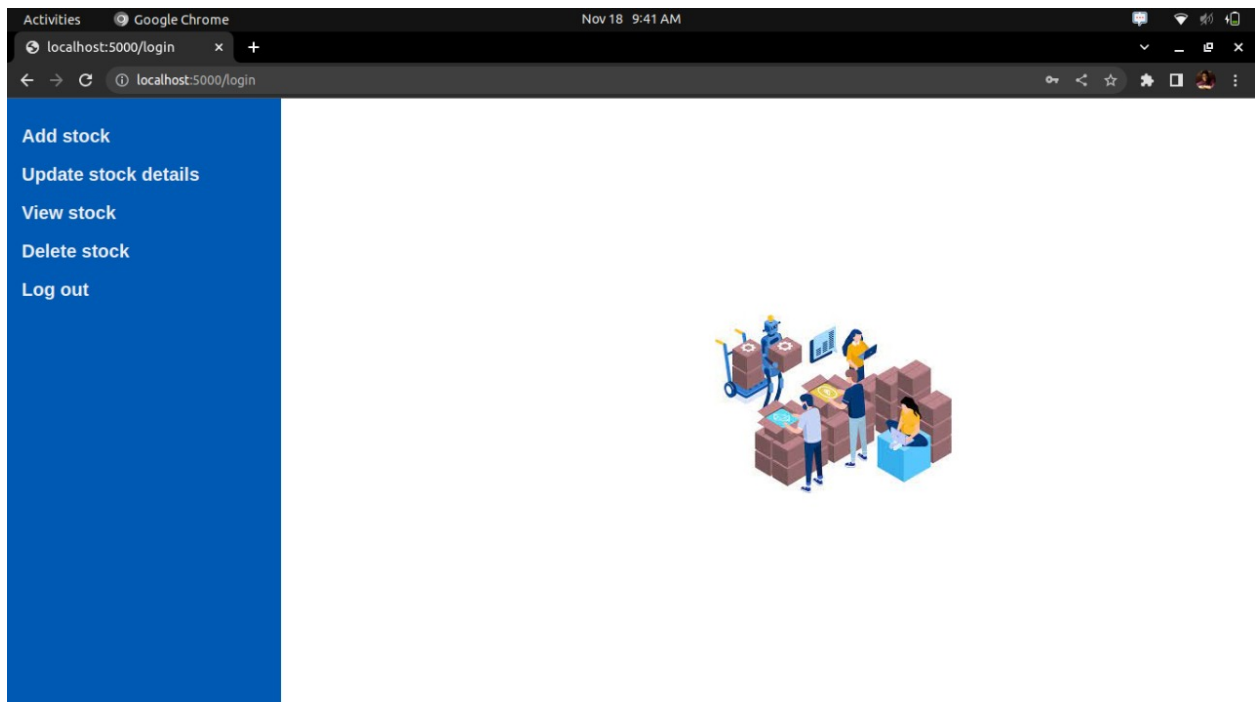
Home page



Login page



Interface



Product Details

Activities Google Chrome Nov 18 9:43 AM

localhost:5000/view_stock x +

localhost:5000/view_stock

- Add stock
- Update stock details
- View stock
- Delete stock
- Log out

Product name	Item quantity	Warehouse location
soap	50	Chennai
lamp	20	Banglore
bottle	150	Chennai
chair	10	Banglore

Update stock

Activities Google Chrome Nov 18 9:42 AM

Add stock x +

localhost:5000/update

- Add stock
- Update stock details
- View stock
- Delete stock
- Log out

UPDATE STOCK

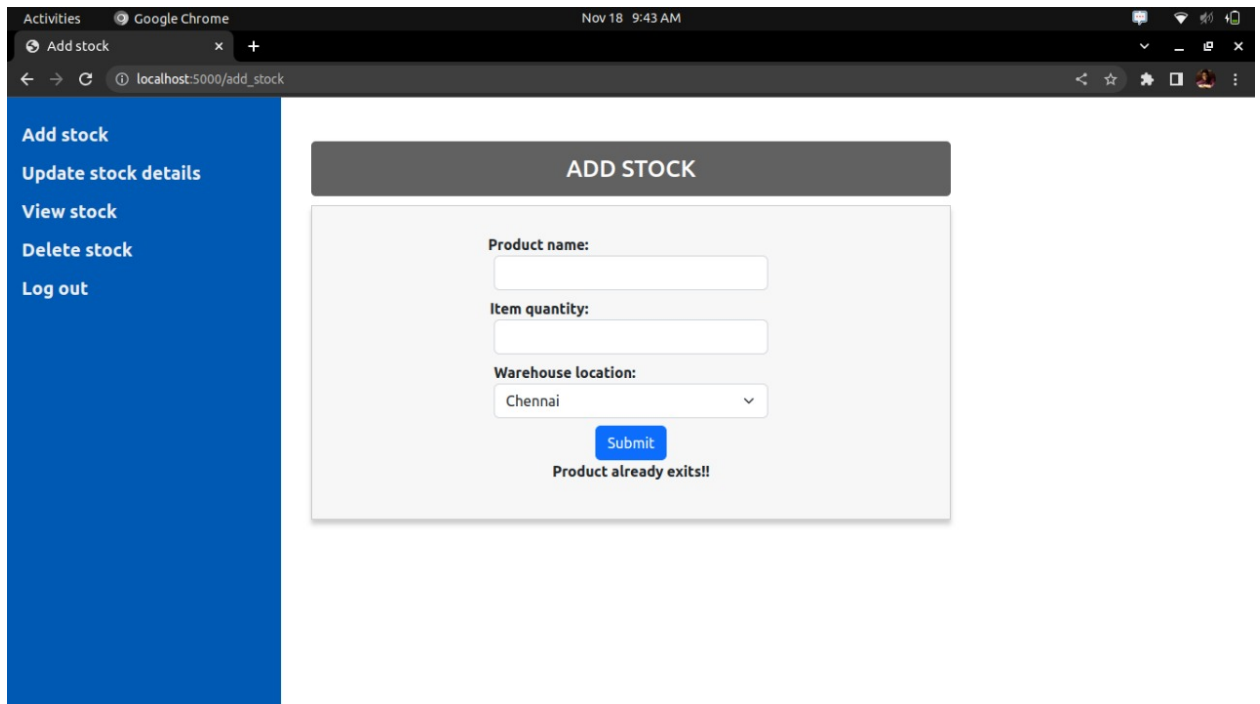
Product name:

Item quantity:

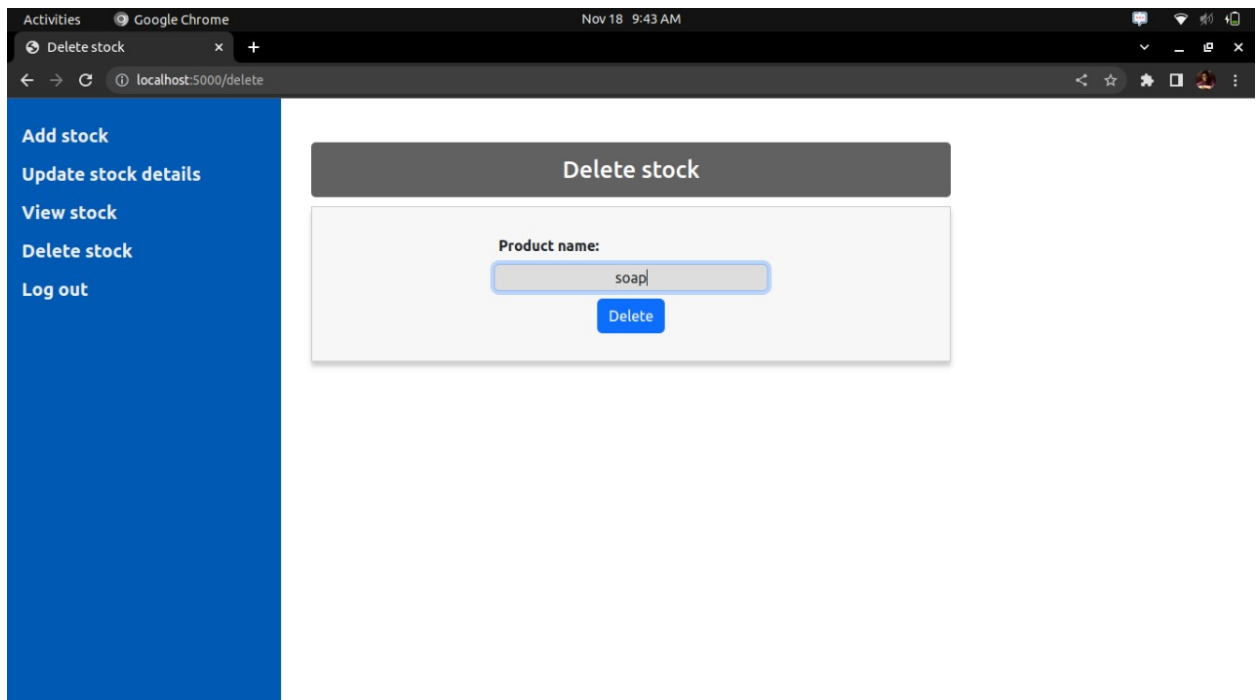
Warehouse location:

Update

Add stock

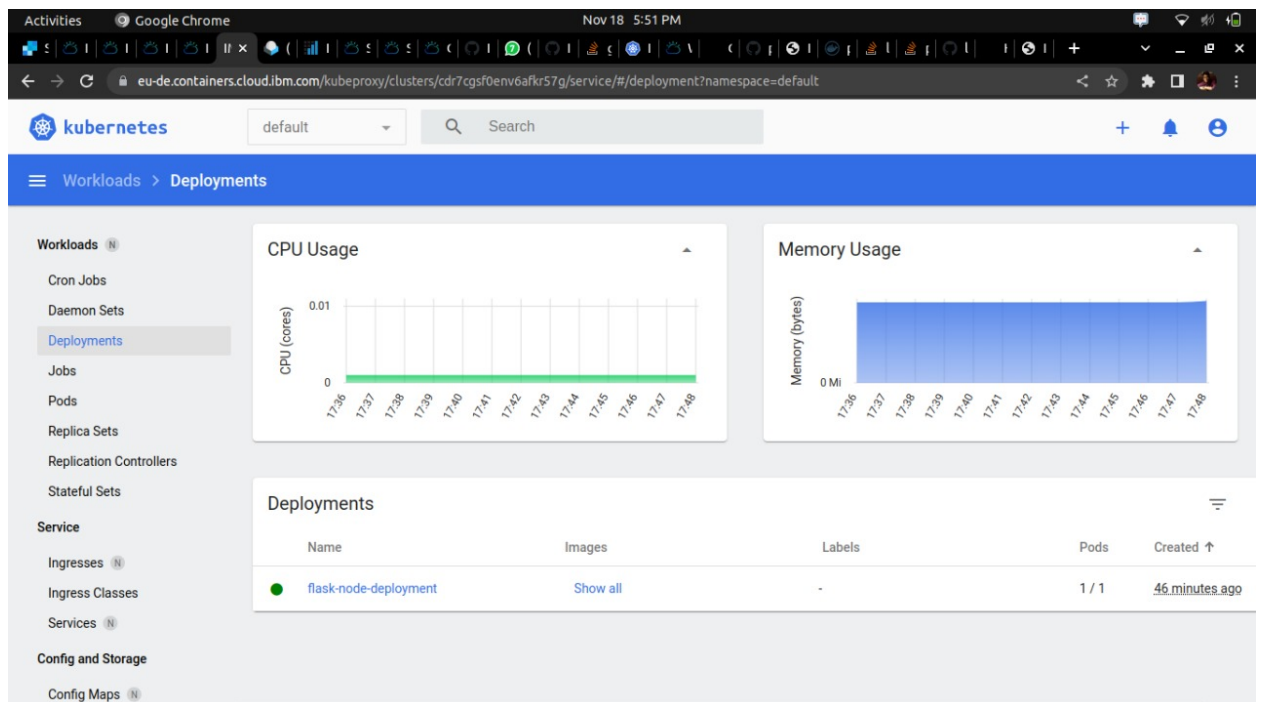


Delete stock

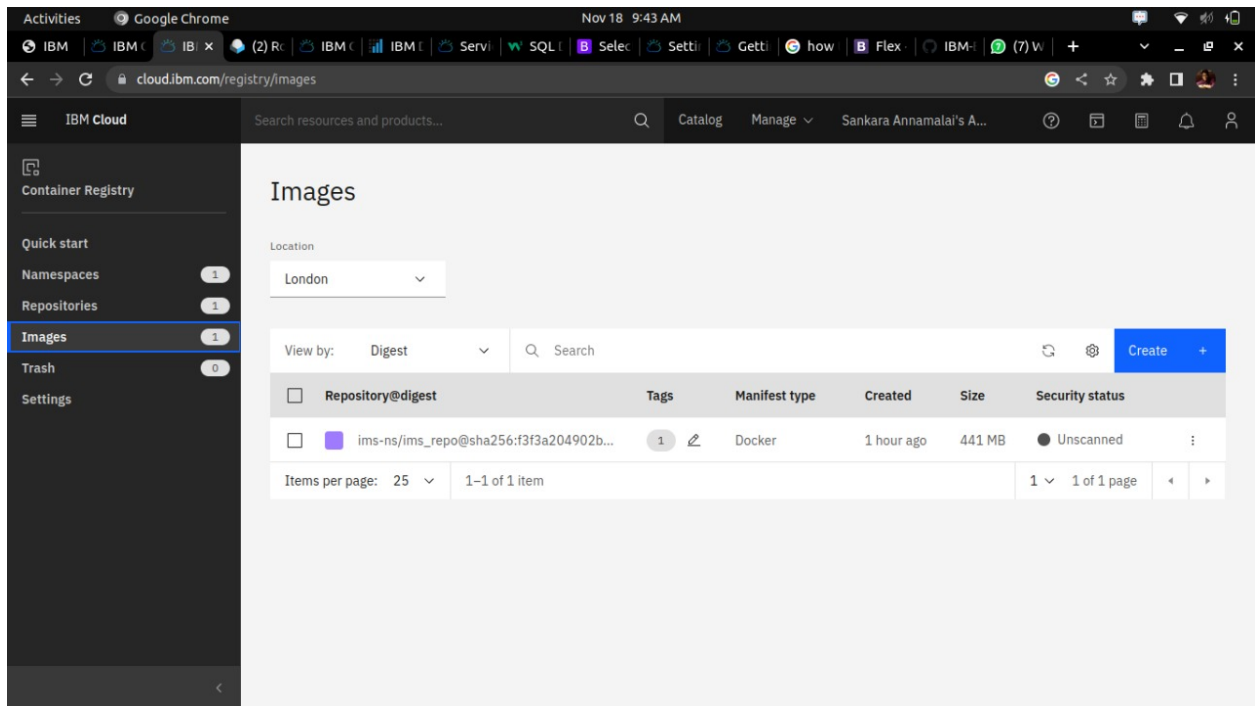


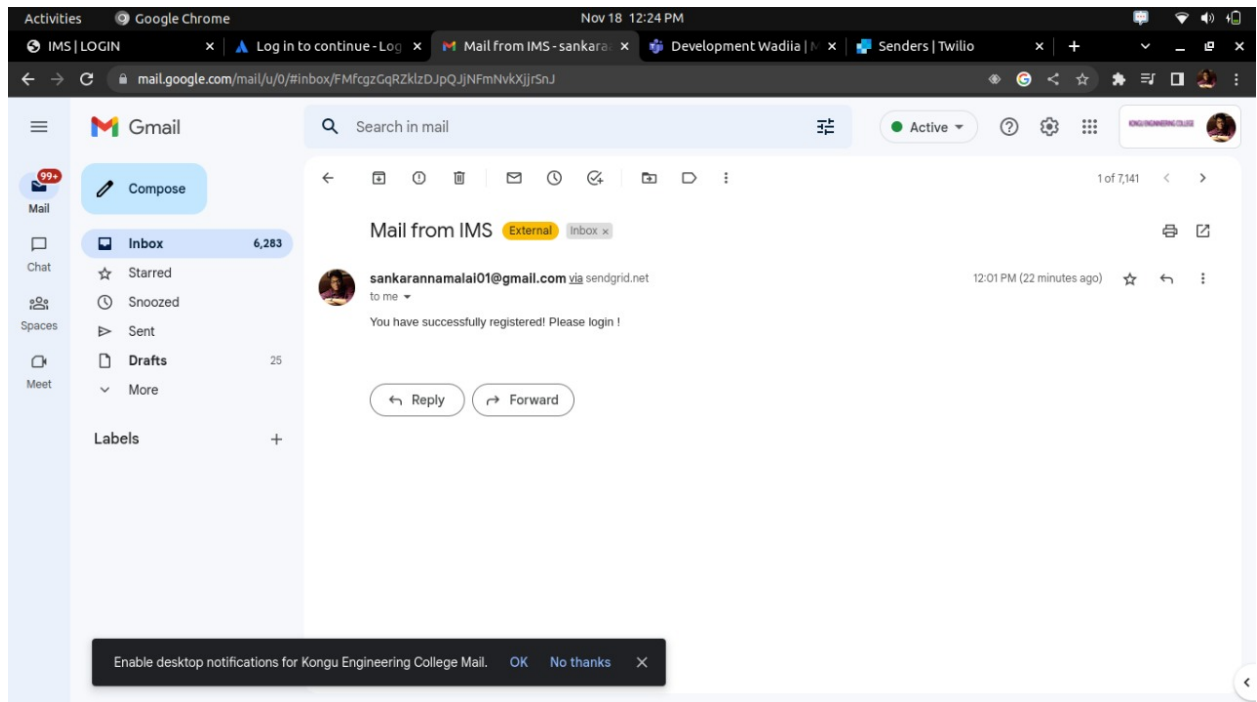
7.2 Feature 2

Backend IBM DB2



Backend IBM Cloud





8. TESTING

8.1 Test Cases

Login

- Verify user is able to see login page
- Verify user is able to login to application or not?
- Verify login page elements

Register

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

Add products

- Verify user is able to add products in add product page
- Verify whether added products are correctly added in the table

View products

- Verify whether products can be viewed in view page
- Verify whether products can be retrieved correctly from database

Update Products

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

Delete Products

- Verify user is able to delete product movements
- 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_OO1	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 2.Click on My Account dropdown button 3.Verify login/Signup popup displayed or not	inventorymanagement.localhost
LoginPage_TC_OO2	UI	Home Page	Verify the UI elements in Login/Signup popup		1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Signup popup with below UI elements: a.email text box b.password text box c.login button d.New customer? Create account link e.Last password? Recovery password link	inventorymanagement.localhost
LoginPage_TC_OO3	Functional	Home page	Verify user is able to log into application with Valid credentials		1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: abisheklr66@gmail.com password: abi123
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: abisheklr66@gmail.com password: abi123
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter invalid password in password text box 5.Click on login button	Username: abisheklr66@gmail.com password: abi1233ha82
LoginPage_TC_OO5	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter invalid password in password text box 5.Click on login button	Username: abisheklr password: abi1233ha82

Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Signup popup displayed or not	inventorymanagementlocalhost	Login/Signup popup should display	Working as expected	Pass				
1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Signup popup with below UI elements: a.email text box b.password text box c.login button d.New customer? Create account link e.Last password? Recovery password link	inventorymanagementlocalhost	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Fail	Steps are not clear to follow		BUG-1234	Abishek L R
1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: abishekr66@gmail.com password: abi123	User should navigate to user account homepage	Working as expected	pass				
1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: abishekr66@gmail.com password: abi123	Application should show 'incorrect email or password' validation message.	Working as expected	Fail	need to verify		bug-1235	Yaswanth M
1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter Invalid password in password text box 5.Click on login button	Username: abishekr66@gmail.com password: abi1233ha82	Application should show 'incorrect email or password' validation message.	Working as expected	pass				
1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter Invalid password in password text box 5.Click on login button	Username: abishekr password: abi1233ha82	Application should show 'incorrect email or password' validation message.						

9. RESULTS

Thus in this way we developed a "Inventory Management System For Retailers" using Python, SendGrid and IBM Cloud Services (IBM DB2,IBM Container Registry,IBM Kubernetes).

10.ADVANTAGES & DISADVANTAGES

10.1 ADVANTAGES:

- **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.

- **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

- **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.

- **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:

- **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.

- **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.

- **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.

- **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

INVENTORY MANAGEMENT SYSTEM application with IBM DB2 as database and mail service with Sendgrid has been dockerized and pushed to container registry of IBM and successfully deployed in Kubernetes IBM service.

12. FUTURE SCOPE

In future, we can scale this application and use in large sectors as well as small ones and can be used in different fields.

13. APPENDIX

13.1 Source 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.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&di
splay=swap" rel="stylesheet">
</head>
<body>
    <!-- bootstrap navbar -->
    <nav class="navbar sticky-top navbar-expand-lg navbar-dark">
        <div class="container-fluid">
            <a class="main-logo-img mt-3" href="#">
            <!-- <a class="navbar-brand"
href="index.html">JobPortal</a>
-->
        </div>

        <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>
<!-- navbar ends -->
<!-- what we focus on -->
<section class="our-focus">
    <div class="container">
        <h2 class="text-center mt-3">ABOUT US</h2>
        <div class="row ml-3 mt-3">
            <div class="col-lg-3 mr-5" id="focus-first">
                <div class="card" style="width: 19rem;"

                    <!-- 
                    <div class="card-body">
                        <h5 class="card-title">PURPOSE</h5>
                        <p class="card-text">An inventory management
system isthe process by which you track your goods throughout your entire
supply chain, from purchasing to production to end sales. It governs how you
approach inventory management for your business.</p>
                    </div>
                </div>
            </div>
            <div class="col-lg-3 mr-5" id="focus-second">
                <div class="card" style="width: 20rem;"

                    <!-- 
                    <div class="card-body">
                        <h5 class="card-title">VISION</h5>
                        <p class="card-text">The primary goal of

```


System is a process of ordering, storing, and using inventories. This stock management includes 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 balance sheet.

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//f6V8Qbs
w3" 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.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="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="#">
        <!-- <a class="navbar-brand" href="index.html">JobPortal</a> --
        >
    </a>
    </div>
    <!-- navbar ends -->
    <!-- Login form -->
    <div class="login text-center mt-5">
        <h2> Register Form </h2>
        <form action="/register" method="post">
            <div class="msg">{{ msg }}</div>
            <!-- <input type="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="Enter Your 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> already have an account ? please login  <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&displa
y=swap" rel="stylesheet">
</head>
<body>
        <!-- bootstrap navbar -->
        <div class="logo mt-3 text-center">
                <a class="main-logo-img mt-5" href="#">
                        <!-- <a class="navbar-brand" href="index.html">JobPortal</a> --
                        >
                </a>
        </div>
        <!-- navbar ends -->
        <!-- 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>

```

GitHub Link : <https://github.com/IBM-EPBL/IBM-Project-26075-1660008978>

Project Link: <http://159.122.187.90:30006/>

Project Demo Video Link:

<https://drive.google.com/file/d/1APZ6B9XGtapJUYvaYU6x010NG8P9ijfq/view?usp=sharing>

