

## PROJECT REPORT

<b>PROJECT TITLE</b>	<b>INVENTORY MANAGEMENT SYSTEM FOR RETAILERS</b>
<b>TEAM ID</b>	<b>PNT2022TMID35255</b>
<b>MEMBERS</b>	<b>ADARSHINI K ARAVINTH KUMAR M SULFIYA PARVEEN M VARSHA SSKM</b>

### LITERATURE SURVEY:

#### 2.1 EXISTING PROBLEM:

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 their products' stocks. 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.

## 2.2 REFERENCES:

Title and Author	Published On	Proposed Approach
<p>A secure and efficient inventory managementsystem for disasters</p> <p>Published by Elsevier Ltd</p>	October 2011	An efficient humanitarian inventory control model and emergency logistics system that plays a crucial role in maintaining a reliable flow of vital supplies to the victims located inthe shelters, minimizing the impacts of the unforeseen disruptions that can occur.
<p>Inventory Management Information System in BloodTransfusion Unit</p> <p>Authored by Fitra Lestari, Ulfah , Fitri Roza Aprianis and Suherman</p>	December 2018	Provide services to consumers while solving the problem of unbalanced blood supply information and consumer demand. Build an information system model using the system development life cycle approach to manage blood demand.

<p>A Material Management in Construction Project Using Inventory Management System</p> <p>Authored by M. Ashika</p>	<p>November 2019</p>	<p>Prepare a scheme of material management in the construction industry for building projects also conducting a survey of the industry and determine the various format for construction material management. As well as talk about the tracking system of material management in the industry and also discuss the software development for proper management</p>
<p>Cloud-Based Inventory Management System Using a Smart Trolley for Automated Billing and Theft Detection</p> <p>Authored by B. Karunakara Rai, J. P. Harshitha, Radhika S. Kalagudi, B. S. Priyanka Chowdary, Palak Hora &amp; B. Sahana</p>	<p>February 2019</p>	<p>This paper proposes an architecture of a smart trolley which provides an automated billing, anti-theft system, and facilitates inventory management through a web application. This is achieved on a cloud-based platform using RFID and Wi-Fi technology.</p>
<p>An IoT Quality Global Enterprise Inventory Management Model for Automation and Demand Forecasting Based on Cloud</p> <p>Authored by Athul Jayaram.</p>	<p>December 2017</p>	<p>Industrial Internet of Things (IIoT) collects useful data from machines and sensors which can be used for demand forecasting of the enterprise and automation. The proposed IIoT Quality Inventory Management Model can be used for automation and demand forecasting of inventories.</p>

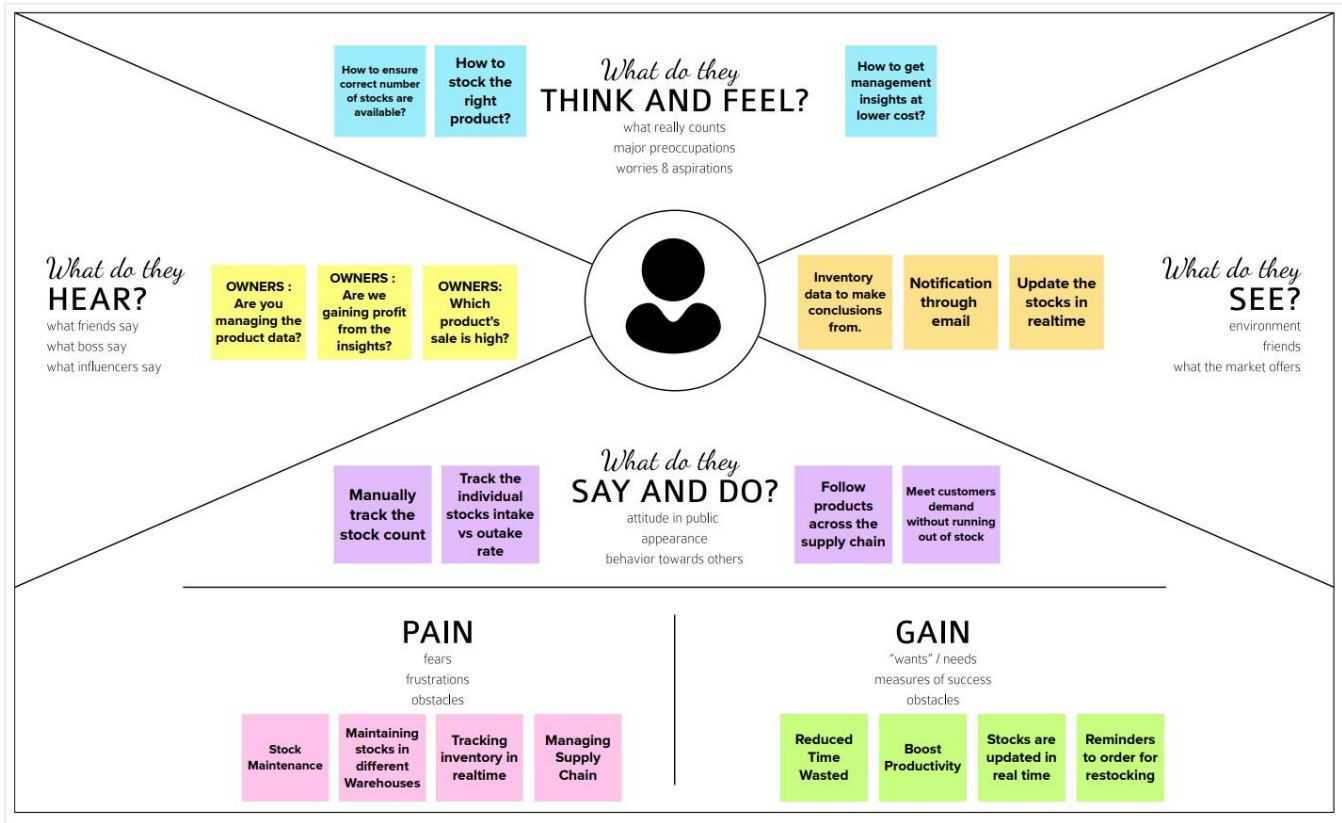
<p>Effects of yield and lead-time uncertainty on retailer-managed and vendor-managed inventory management.</p> <p>Authored by Soonkyo lee, Young joo kim, Taesu cheong, Seung ho yoo.</p>	<p>December 2019</p>	<p>This paper aims to model the possible relationship( decentralized and centralized ) between retailer and salvage retailer. Zero-ending inventory also boosts sales and profitbased on the demand formulation.</p>
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### 2.3 PROBLEM STATEMENT DEFINITION:

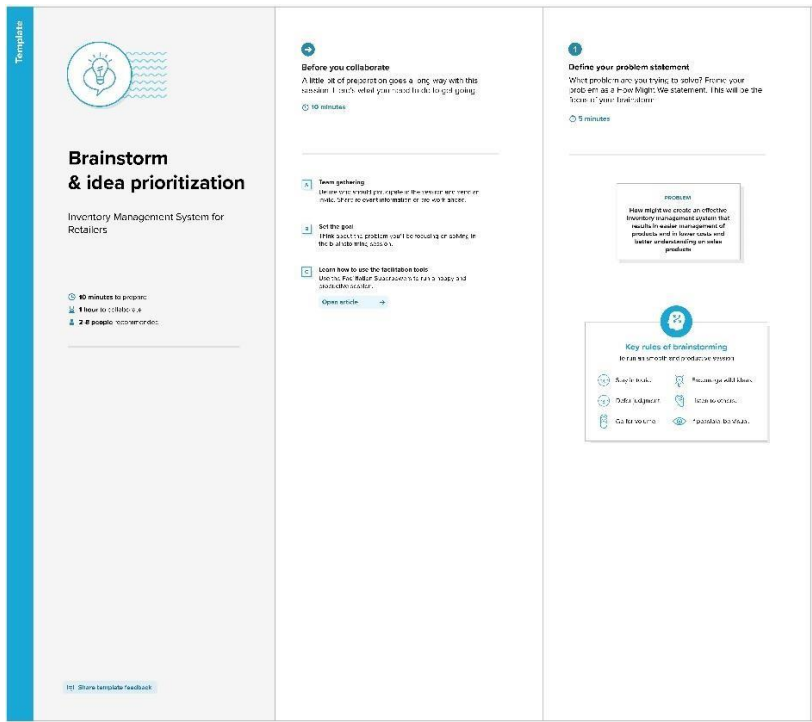
Retail inventory management is ensuring you carry merchandise that shoppers want, with neither too little nor too much on hand. By managing inventory, retailers meet customer demand without running out of stock or carrying excess supply. To create effective retail inventory management that results in lower costs and a better understanding of sales patterns. It must include tools and methods that give retailers more information on which to run their businesses. It should ask retailers to create their accounts by providing essential details. Retailers should be able to access their accounts by logging into the application. Once retailers successfully log in to the application they should be able to update their inventory details, also users will be able to add new stock by submitting essential details related to the stock. They should be able to view details of the current inventory. The System should automatically send an email alert to the retailers if no stock is found in their accounts. So that they can order new stock

3 IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTROMING

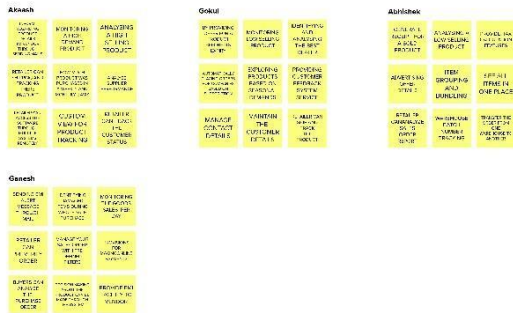


2

**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. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can 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



➔

**After you collaborate**

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

**Quick add-ons:**

- A Share the mural**  
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.
- B Export the mural**  
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

**Keep moving forward**

- Strategy blueprint**  
Define the components of a new idea or strategy.  
[Open the template →](#)
- Customer experience journey map**  
Understand customer needs, motivations, and obstacles for an experience.  
[Open the template →](#)
- Strengths, weaknesses, opportunities & threats**  
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.  
[Open the template →](#)

[Share template feedback](#)

### 3.3 PROPOSED SOLUTION

S.No	Parameter	Description
1	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"><li>• The retailers generally face issues in recording the stocks and its threshold limit available.</li><li>• The retailers don't know which product is getting expired and when it is being expired.</li><li>• The retailers couldn't track the availability of all the stocks up-to date.</li><li>• The customers are not satisfied with the retailer's store since it doesn't have enough supplements and the deliveries were not made on time.</li></ul>
2	Idea / Solution description	<ul style="list-style-type: none"><li>• This proposed system will have a daily update system whenever a product is sold or it is renewed more.</li><li>• The system will have an alert triggered to indicate both the expired product and soon going to expire products.</li><li>• The product availability is tracked daily and an alert system is again kept on to indicate those products which fall below the threshold limit.</li><li>• All the customers can register their accounts after which they will be given login credentials which they can use whenever they feel like buying the stocks.</li><li>• 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.</li><li>• Tracking the order has become easy with this application for both the retailers and the customers.</li></ul>
3	Novelty / Uniqueness	<ul style="list-style-type: none"><li>• Certain machine learning algorithms are used to predict the seasonal high selling products which can be made available during that time.</li><li>• Prediction of the best selling brand of all</li></ul>

		<p>certain products based on their popularity, price and customer trust and satisfaction will be implemented.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Notification will be sent to the customers who buy any certain products regularly when the new arrivals are stocked up.</li> <li>• Exclusive discounts and offers are given for regular customers to keep them engaged with the store regularly.</li> </ul>
4	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> <li>• The customers will be highly satisfied since the wasting of time while searching for an unavailable product is reduced.</li> <li>• The workload of the retailers will be minimized if the system is automated every day and during every purchase.</li> <li>• The customer satisfaction will be improved for getting appropriate response from the retailers and that too immediately.</li> </ul>
5	Business Model (Revenue Model)	<ul style="list-style-type: none"> <li>• Hereby we can provide a robust and most reliable inventory management system by using -</li> <li>• ML algorithms for all the prediction purposes using all the past dataset since datasets are undoubtedly available in huge amounts.</li> <li>• Can deploy the most appropriate business advertising models.</li> <li>• To establish a loss prevention strategy.</li> <li>• And to ensure the all time, anywhere availability of products system.</li> <li>• Usage of freebies business strategy for dragging the customer's attention.</li> </ul>



6	Scalability of the Solution	<ul style="list-style-type: none"> <li>• This system can even work more efficiently with large volumes of data.</li> <li>• Implementation of anyone and anywhere using the system can be helpful for even a commoner to buy the products.</li> <li>• Daily and each time purchase updates of the stock for preventing inventory shrinkage.</li> <li>• Direct chat system with the retailers and the customers for providing best customer service.</li> </ul>
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### 3.4 PROBLEM SOLUTION FIT

Define CS, fit into CL	<b>1. CUSTOMER SEGMENT(S)</b> <b>CS</b> Retailers generally keep track of their merchandise from the time it is bought until it is sold.	<b>6. CUSTOMER LIMITATIONS</b> <small>EG. BUDGET, DEVICES</small> <b>CL</b> <ul style="list-style-type: none"> <li>• Openness to availability</li> <li>• Network Restrictions</li> <li>• Changing the cost of commodities</li> <li>• Delays in delivery</li> </ul>	<b>5. AVAILABLE SOLUTIONS</b> <small>PLUSSES &amp; MINUSES</small> <b>AS</b> <ul style="list-style-type: none"> <li>• Manually counting and tallying items</li> <li>• Management of log books in standard way</li> <li>• Hiring employees and accountants to maintain stock</li> </ul>	Explore AS, differentiate
	<b>2. PROBLEMS / PAINS</b> <small>+ ITS FREQUENCY</small> <b>PR</b> <ul style="list-style-type: none"> <li>• Avoid overstocking of products</li> <li>• To notify the retailers about the items that are out of stock</li> <li>• Poor demand forecasting</li> </ul>	<b>9. PROBLEM ROOT / CAUSE</b> <b>RC</b> <ul style="list-style-type: none"> <li>• Manual work consumes time and it is error prone</li> <li>• Not much organised</li> </ul>	<b>7. BEHAVIOR</b> <small>+ ITS INTENSITY</small> <b>BE</b> <ul style="list-style-type: none"> <li>• Enquire the retailers in the neighbourhood</li> <li>• Get reference from customers who visit their shop</li> </ul>	Focus on PR, tap into BE, understand RC
Identify strong TR & EM	<b>3. TRIGGERS TO ACT</b> <b>TR</b> <ul style="list-style-type: none"> <li>• Need separate knowledge for maintenance</li> <li>• Maintaining large number of records by single individual</li> </ul>	<b>10. YOUR SOLUTION</b> <b>SL</b> Development of an cloud application that "Tracks real-time inventory such as purchase details, sales information and stock management" and "alters the user on less availability of stocks"	<b>8. CHANNELS of BEHAVIOR</b> <b>CH</b> <b>ONLINE</b> Immediate accessibility irrespective of place and time	Extract online & offline CH of BE
	<b>4. EMOTIONS</b> <small>BEFORE / AFTER</small> <b>EM</b> <ul style="list-style-type: none"> <li>• Before: Frustrated, worried, lack of knowledge about stocks</li> <li>• After: Happy, profitable, flexible working</li> </ul>		<b>OFFLINE</b> SMS notifications for inventory	

## 4. REQUIREMENT ANALYSIS

### 4.1 FUNCTIONAL REQUIREMENT

following are the functional requirements of the proposed solution.

FR No	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
1	User Registration	<ul style="list-style-type: none"><li><input type="checkbox"/> User can registration through own application Form</li><li><input type="checkbox"/> User can registration through Gmail</li><li><input type="checkbox"/> User can registration through LinkedIN</li></ul>
2	User Confirmation	<ul style="list-style-type: none"><li>• Confirmation will be sent through email</li><li>• Confirmation will be sent through OTP</li></ul>
3	User Login	<ul style="list-style-type: none"><li>• Login through User name and password.</li><li>• Login through mail I'D and password.</li></ul>
4	Records of the products	<ul style="list-style-type: none"><li>• Product name</li><li>• Product category</li><li>• Product ID</li><li>• Stock Count</li><li>• Vendor details</li></ul>
5	Updating the inventory Details	<ul style="list-style-type: none"><li>• Update through E-mail</li><li>• Update through User account</li></ul>
6	Alert	Alert Message through mail or phone number if the stock is less or unavailable
7	Auditing the stocks	Logging and storing the incoming and outgoing stocks

## 4.2 NON-FUNCTIONAL REQUIREMENT

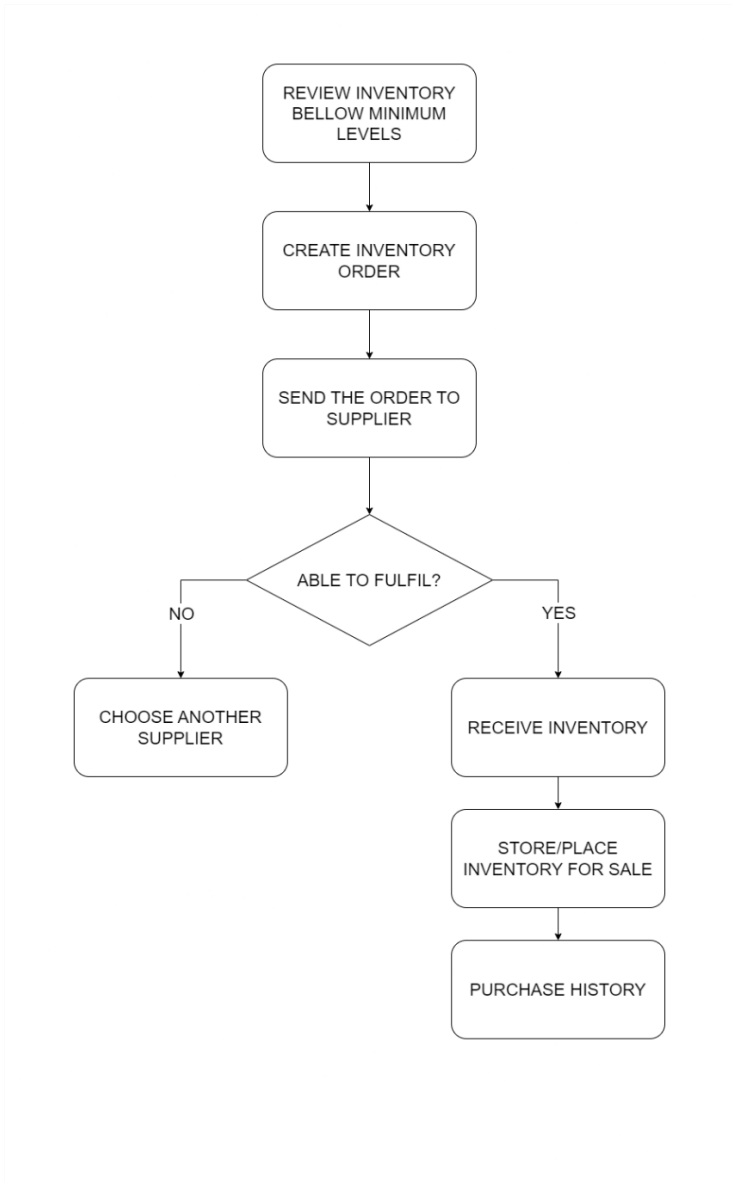
Following are the non-functional requirements of the proposed solution

<b>NFR No.</b>	<b>Non-Functional Requirement</b>	<b>Description</b>
<b>1</b>	Availability	The availability of product is just one way in which an inventory management system creates customer satisfaction. Inventory management systems are designed to monitor product availability, determine purchasing schedules for better customer interaction
<b>2</b>	Scalability	Scalability is an aspect or rather a functional quality of a system, software or solution. This proposed system for inventory management system can accommodate expansion without restricting the existing workflow and ensure an increase in the output or efficiency of the process
<b>3</b>	Reliability	It will be reliable that it can update with very time period so that the accuracy will be good.
<b>4</b>	Security	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. With Registered Mail id only, retailers can log into the application. So, it provides authentication.
<b>5</b>	Performance	User can track the record of goods available using the application. Inventory tracking helps to improve inventory management and ensures that having optimal stock available to fulfil orders. Reduces manpower, cost and saves time. Emails will be sent automatically while stocks are not available. Makes the business process more efficient. Improves organizations performance.

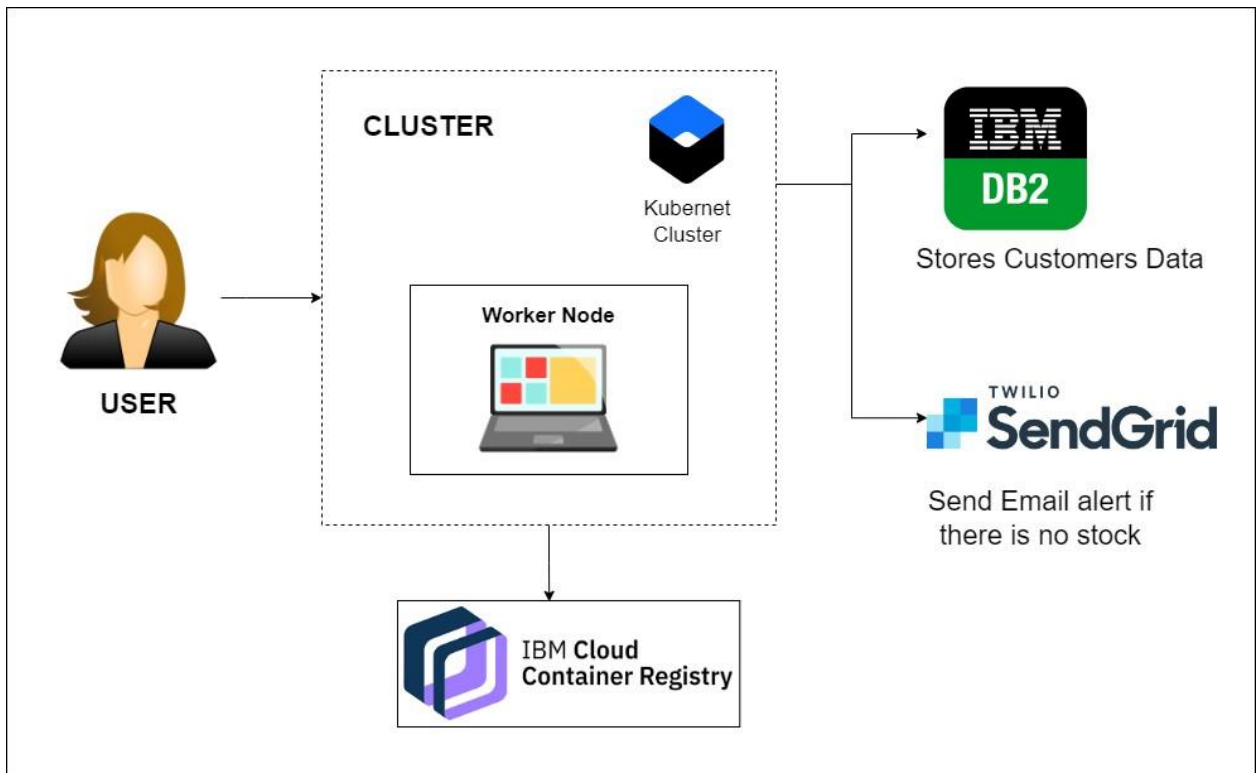
6	Usability	Once retailers successfully log in to the application they can update their inventory details, also users will be able to add new stock by submitting essential details related to the stock. They can view details of the current inventory. The System will automatically send an email alert to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

### 5.1 DATA FLOW DIAGRAMS



## 5.2 SOLUTION & TECHNICAL ARCHITECTURE



## 5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story/Task	Acceptance criteria	Priority	Release
Customer (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	I can receive confirmation email & click confirm	High	Sprint-1

			registered for the application			
		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
<b>Customer (Web user)</b>	Registration	USN-7	As a user, I can register for the application by entering my email, password, and confirming	I can access my account / dashboard	High	Sprint-1

			my password.			
		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
	Login	USN-11	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-12	As a user, I can track data of sales of products and	I can track data of sales of products and	High	Sprint-1

			inventory levels	inventory levels.		
<b>Customer Care Executive</b>	Support	USN-13	As a Executive, I Provide answers for the queries asked by users	I provide the answers for the queries asked by the users.	High	Sprint-1
<b>Administrator</b>	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 an 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



## 6. PROJECT PLANNING & SCHEDULING

### 6.1 SPRINT PLANNING AND ESTIMATION

<b>Sprint</b>	<b>Functional Requirement(Epic)</b>	<b>User Story Number</b>	<b>User Story / Task</b>	<b>Story Points</b>	<b>Priority</b>	<b>Team Members</b>
Sprint 1	Registration	USN-1	As a user, I can register for the application by entering my email,password, and confirming my password.	5	High	Adarshini Varsha Sulfiya Aravinth
Sprint 1		USN-2	As a user, I will receive confirmation email onceI have registered for the application	4	High	Adarshini Varsha Sulfiya Aravinth
Sprint 1		USN-3	As a user, I canregister for the application through Gmail	3	Medium	Adarshini Varsha Sulfiya Aravinth
Sprint 1	Login	USN-4	As a user, I can log into the application by entering email & password	4	High	Adarshini Varsha Sulfiya Aravinth
Sprint 1	Dashboard	USN-5	As a user, I can see the stock in hand and how much stock will be received and check other details.	4	High	Adarshini Varsha Sulfiya Aravinth

Sprint 2	Customer details	USN-6	As a user, I can see the customer details like name, company, location, and so on.	3	Low	Adarshini Varsha Sulfiya Aravinth
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Sprint 2	Invoice management	USN-7	As a user, I can see, manage, and update or modify the invoice of myshop	1	Low	Adarshini Varsha Sulfiya Aravinth
Sprint 2	Sale and order management	USN-8	As a user, I can see, manage, and update the sale and order	5	Medium	Adarshini Varsha Sulfiya Aravinth
Sprint 2	Return management	USN-9	As a user, I can manage the returned items and check for damaged or defective items.	5	Medium	Adarshini Varsha Sulfiya Aravinth
Sprint 2	Purchase order management	USN-10	As a user, I can enter the newly purchased stock and add or remove the stocks. And upload the purchased details as well.	5	Medium	Adarshini Varsha Sulfiya Aravinth
Sprint 3	Stocks	USN-11	As a user, I can see the stock level, fast-moving, and death stocks.	4	High	Adarshini Varsha Sulfiya Aravinth
Sprint 3	Report	USN-12	As a user, I can see the report of the stock	1	Low	Adarshini Varsha Sulfiya Aravinth

Sprint 3	Notification	USN-13	As a user, it is good if I get a notification for lowstock.	2	Medium	Adarshini Varsha Sulfiya Aravinth
Sprint 3	Supplier	USN-14	As a user, I can see the supplier details for a better understanding.	3	Low	Adarshini Varsha Sulfiya Aravinth
Sprint 3	Profile	USN-15	As a user, I can see my profile and give my details after registering as well.	1	Low	Adarshini Varsha Sulfiya Aravinth
Sprint 4	Bill	USN-16	As a user, I like to print the product that is sold now and maintain it.	4	Medium	Adarshini Varsha Sulfiya Aravinth
Sprint 4	Chatbot	USN-17	As a customer care executive, I can view the	4	High	Adarshini Varsha Sulfiya Aravinth

			complaints on chat box,As a customer, I should be able solve and replyfor the customers queries and as a customer, I can close the complaint after assisting			
Sprint 4	Containerization	USN-18	As a user, I can access the softwarewith high performance	10	High	Adarshini Varsha Sulfiya Aravinth
Sprint 4	Deployment	USN-19	As a user, I can accessthe software in the web	10	High	Adarshini Varsha Sulfiya Aravinth

# Velocity

Sprint Duration - 6 Days

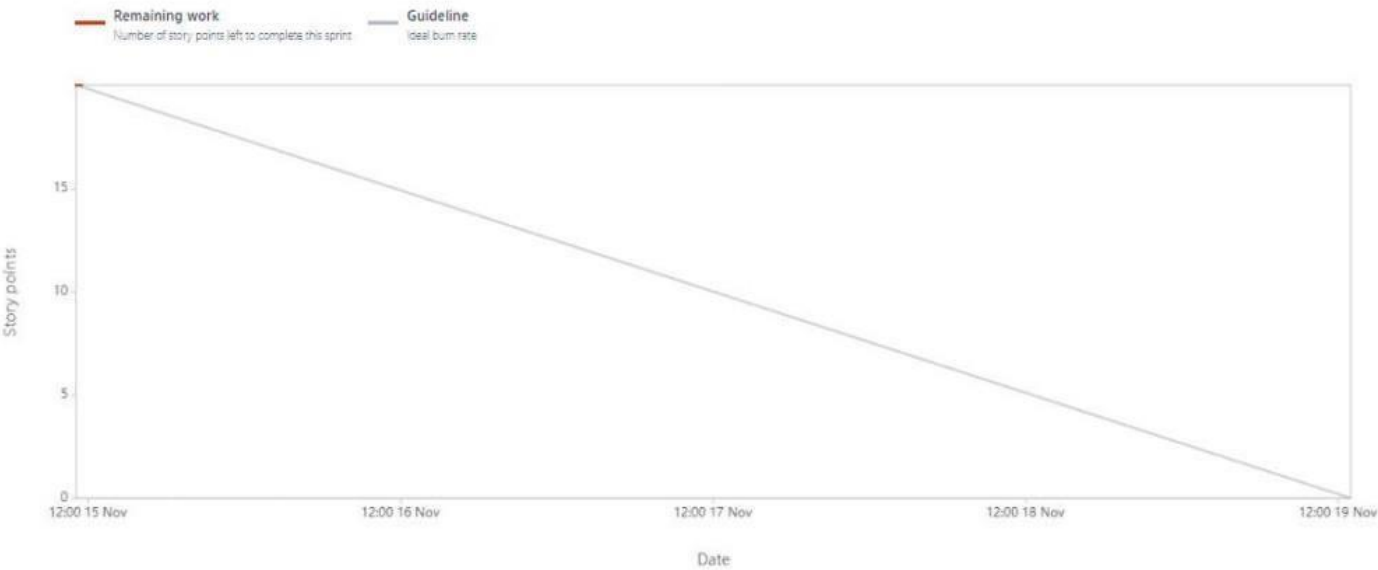
Velocity of the Team - 20 (points per sprint)

Team’s Average Velocity AV = story points / velocity sprint duration = 206 = 3.3

## Burndown Chart

Date - October 24th, 2022 - October 29th, 2022

Sprint goal - to complete user registration, login, and product dashboard



Report: IMSFR Sprint 1

\*Issue added after sprint start