INVENTORY MANAGEMENT SYSTEM FOR RETAILERS

A PROJECT REPORT

Submitted by

BABU R   732119205009

ARUN M   732119205007

LATHA S   732119205025

SURIYAKALA B   732119205049

TEAM ID : PNT2022TMID32248

NANDHA COLLEGE OF TECHNOLOGY, ERODE - 5

vaikalmedu, perundhurai - 638 052

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1 . INTRODUCTION

1.1 : Project Overview

✔ Inventory management system is designed for the retailers to record the information about the day to day transaction of stock of an organization.

✔ This serve as the central database where information is updated as items are scanned,updating the quantity of items.

1.2 : Purpose

The Purpose of this project is

✔ To help the business for managing the order,stock,storage in an easy

and efficient manner by usage of inventory.

✔ By the effective management ,the retailers can easily know the items which are in stock and where it is located.

✔ To reduce the work of the retailers

✔ By the way,it is the balancing act of always having enough stock to meet demand,while spending as little as possible on ordering and carrying inventory.

2. LITERATURE SURVEY

2.1Existing Problem :

➤ Data from different key performance metrics,which take into account several aspects of the inventory influencing the business.

➤ Methodology(such as AUD and MDP) to forecast revenue and discount on the products.

➤ Tools(such as RFID and barcodes) to maintain correct records across digital and physical databases.

References :

☆ https://www.ibm.com/blogs/internet-of-things/connected-trains-rail-travel/

☆https://indianrailways.gov.in/railwayboard/uploads/directorate/secretary_branches/IR_Reforms/Innovation%20in%20Indian%20Railways%20.pdf

☆ Indian Railways Vision 2020 (Para 6.1 Reinventing Passenger Services with Change for a better tomorrow as the motto, Page 8-9)

☆ Travel, Transportation & Hospitality page on www.tcs.com

☆ https://international-railway-saftey-council.com/about-us

☆ http://sts.hitachirsil.com/en/products-services/glossary

2.3 Problem Statement definition :

●The problem faced by the retailers is that they do not have any system to record and keep their inventory data.

●It is difficult for the owner to record the inventory data quickly and safely because they only keep it in the logbook and not properly organized.
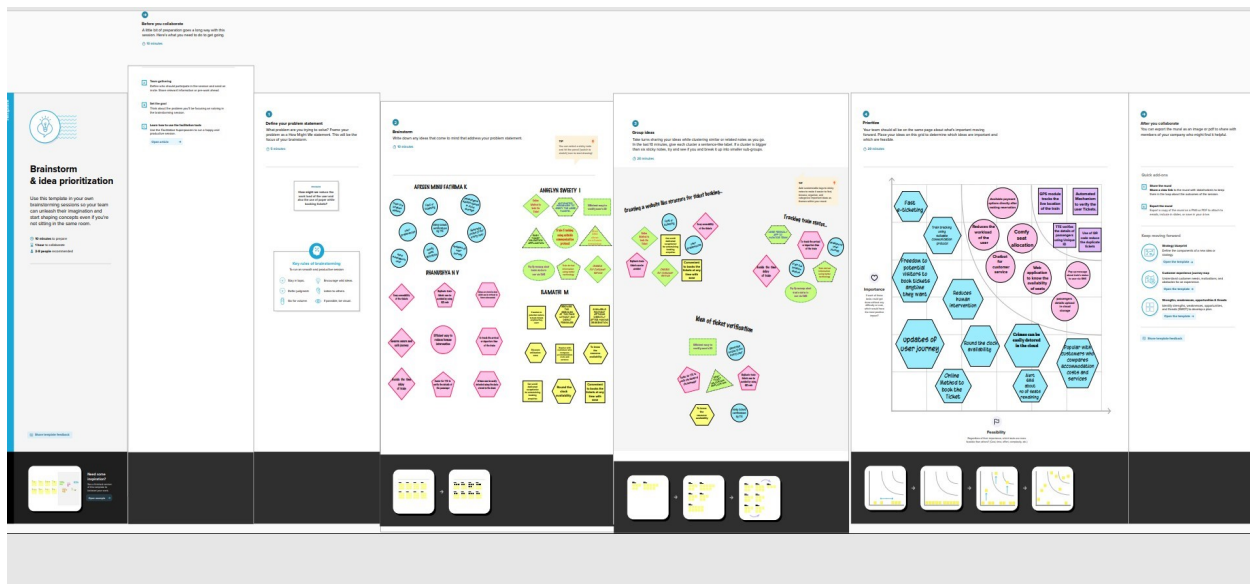
● To avoid shortages,managers often maintain a safety stock in a inventory management system.

3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

3.2 Ideation & Brainstorming

3.3 Proposed Solution

Project team shall fill the following information in proposed solutiontemplate.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	· The customers are not satisfied with the retailers storesince it doesn't have enough supplements and the deliveries were notmade on time
2.	Idea / Solution description	- 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 afterwhich they willbe given a logincredentials which they can use whenever they feel like buyingthe stocks. . The application allows the customers to know all the presenttime available stocksand also when the new stock will be available on the storefor them to buy
3.	Novelty / Uniqueness	· Prediction of the best selling brand of all certain products based on their popularity, priceand customer trustand satisfaction willbe implemented.
4.	Social Impact / Customer Satisfaction	· The customer satisfaction will be improved for getting appropriate response from the retailers and that too immediately.

5.	Business Model(Revenue Model)	ML algorithms for all the prediction purposesusing all the past dataset since datasets are undoubtedly available in huge amounts. Can deploythe most appropriate business advertising models

6.	Scalability of the Solution	Daily and Eachtime purchase updation of thestockfor preventing inventory shrinkage

3.4 Problem Solutionfit

Problem-Solution fit canvas 2.0 — Inventory Managment System for Retailers

1. CUSTOMER SEGMENT(S) (CS)
- Customers are retailers, shop owners, business people who are struggling to keep track of their inventory.
- Due to this issue, they face many issues like:
  - ✓ Loss due to dead products in the inventory, unavailability of fast moving products, etc.
  - ✓ Unnecessary headache due to improper maintenance of inventory.

Define CS, fit into CC

6. CUSTOMER CONSTRAINTS (CC)
- Since most of the softwares like these will be a subscription model, the customer must be paying as they use them. This may be against their budget.
- To use this software the customer must be trained or he must hire a person to do that for him.
- To deploy this software, the customer must have a powerful device which is compatible with the software.

5. AVAILABLE SOLUTIONS (AS)
- Solution: The traditional solution for the inventory management problem is to track the incoming and outgoing goods with a pen and paper.
- Pros:
  - ✓ Easy to use
  - ✓ Less cost
- Cons:
  - ✓ Error rate is high
  - ✓ Manual tracking is a tedious work

Explore AS, differentiate

2. JOBS-TO-BE-DONE / PROBLEMS (J&P)
- The objective of the software is to make the inventory tracking easier by automating the inventory. Example, the initial stocks information is fed to the software and from there it tracks the details of incoming and outgoing products.
- This can generate automatic alerts/notifications to help the user in their work. Example, Alert for dead stocks in inventory, Alert for the goods which is to be refilled, Notifications for the user defined conditions like if sales go higher than certain limits etc...
- Graphical representation of sales is also possible.

Focus on J&P, tap into BE, understand RC

9. PROBLEM ROOT CAUSE (RC)
- The primary reason for this problem to exist is the periodic change in demand of the customers.
- This indirectly affects the inventory as change in customers needs is proportional to the sale of a particular products.
- This keeping track of inventory effectively helps in managing the dead and fast moving products.

7. BEHAVIOUR (BE)
- The customer must find a effective inventory tracking software.
- He must implement it in his business to streamline his work and make more profit.
- He must volunteer himself to learn to use the software or be ready to hire a person who can do it for him.

Focus on J&P, tap into BE, understand RC

3. TRIGGERS (TR)
- Understanding the fact that using a software to automate inventory system helps him to make more money and also make his work easier. Also seeing other retailers making more money using this software.

4. EMOTIONS: BEFORE / AFTER (EM)
Before: They feel lost due to loses which occur due to improper management of inventory (Manual pen and paper tracking).
After: They feel like success after making increased profits, reducing the mistakes that happen in manual process.

Identify strong TR & EM

10. YOUR SOLUTION (SL)
- ✓ Design a flask based Inventory management system application.
- ✓ Enable email based alerts for dead and fast moving products using sendgrid framework.
- ✓ Provide a option for graphical view of sales

8. CHANNELS of BEHAVIOUR (CH)
8.1 ONLINE
Online Inventory trackers which come for free may steal personal information of users and it may also contains a lot of ads.

8.2 OFFLINE
Manual logs can be maintained. Employees can be hired to maintain the inventory system logs when the business grows.

Extract online & offline CH of BE

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

The functional requirements of the proposed solution are as follows,

FR. No.	Functional Requirement (Epic)	Sub Requirement (Story/Sub-Task)
FR-1	User Registration	Registration through registration form. Registration through One-Tap Google Sign-in.
FR-2	User Authentication and Confirmation	Authentication via Google Authentication. Confirmation via Email.Confirmation via OTP.
FR-3	Productmanagement	Easily track productinformation. Quickly produce reports for singleormultiple products. Track information of dead and fast-movingproducts. Track information of suppliers andmanufacturers of the product.
FR-4	Audit Monitoring	The technique of tracking crucial data isknownas audit tracking. Monitor the financial expenses carried outthroughout the whole time(from receivingorder of the product to delivery of the product).

FR-5	Historical Data	Specify the amount of storage you need tohandle this expansion. Data of everything shouldbe stored foranalytics and forecasting.

R – 6	CRM(Customer Relationship Management)	Track the customer experience via ratingsgiven by them. Get customer reviewsregularly or atleastatthe time of product delivery to work on customer satisfaction. User-friendly GUI to increase the customerbasefrom only techies to normal people. Special offers for regular customers has to be provided through credits in the web-appitself.
FR - 7	Security Policy	User data collected must be as secure aspossible. User data must not be misused. They can only be used for user preferred advertisingpurposes.

4.2 Non-Functional Requirements:

The non-functional requirements of the proposed solutionare as follows,

FR No.	Non-Functional Requirement	Description

NFR-1	Usability	The UI should be accessible to everybody despite of there diversity in languages. People with some impairments should also be able to use theapplication with ease.(Example, integrate google assistant so that blind people can use it). The app and UI should be platform and device independent. It should be compatible withwide range of devicespossible.
NFR-2	Security	The security requirements deal with the primary security. Only authorized userscan access the system withtheir credentials. Administrator or the concerned security team shouldbe alerted on any unauthorized access or data breaches so as to rectifyit immediately.
NFR-3	Reliability	The software should be able to connect to the database in the event of theserver being down due toa hardwareor software failure.

NFR-4	Performance	Performance of the app should be reliable withhigh-end servers on which the software is running.
NFR-5	Availability	The software should be available to the users 24/7with all functionalities working. New moduledeployment should not impact theavailability of existing modules and their functionalities.
NFR-6	Scalability	The wholesoftware deployed must be easilyscalableas the customer base increases.

5 PROJECT DESIGN

5.1 Data Flow Diagram
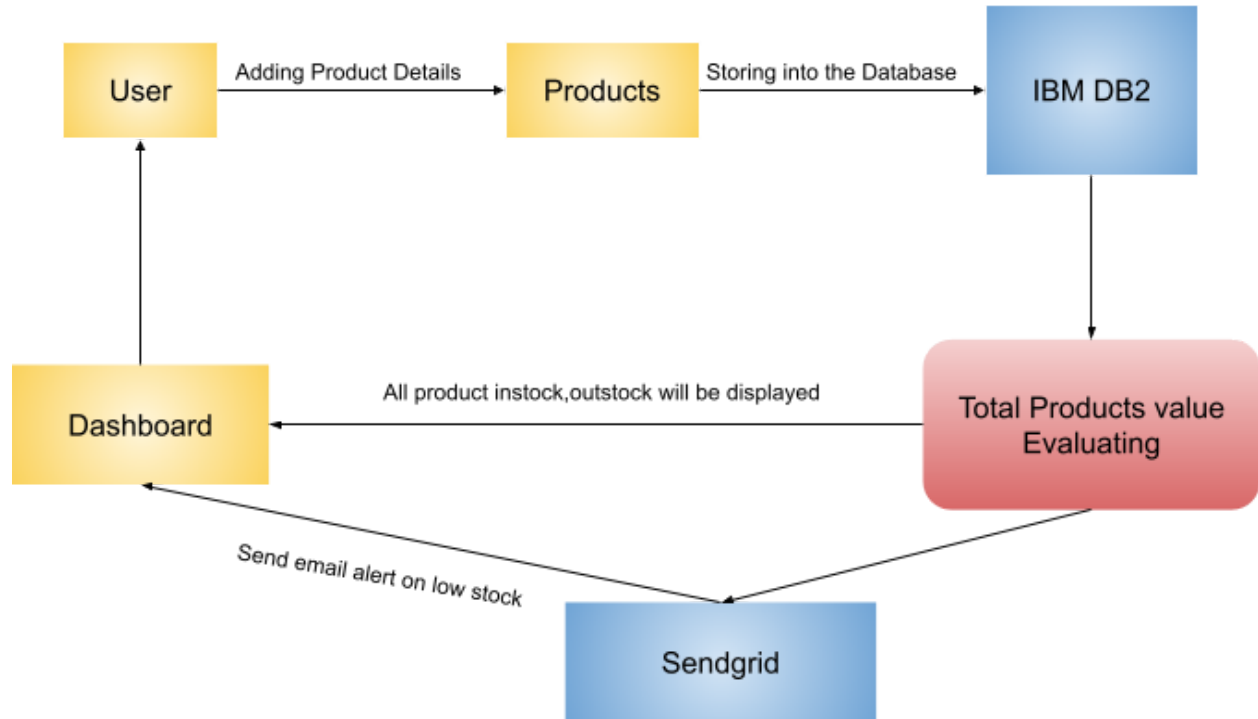
5.2 Technical Architecture

5.3 User Stories

User Type	Functional Requirement(Epic)	User Story Number	User Story/ Task	Acceptance criteria	Priority	Release
Retailer(Webuser)	Registration	USN-1	As a user,I can register for the application by entering my email, password, and confirmingmy password.	I will be redirected to loginpage	High	Sprint-1
		USN-2	As a user, I will receive confirmation emailonceI have registered for the application	I canreceive confirmation email& click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access thedashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user,I can register for the application through Gmail	I can verifyt he OTP number	Medium	Sprint-1
	Login	USN-5	As a user, I can loginto 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 & outcount details	Updation can be made through barcode scanning	High	Sprint -2
	Dashboard	USN-7	As a user, Ican check the low stockdetails through alertmessage	Alert message can be received by registered mail	High	Sprint -1
		USN-8	As a user, I can check thetotal product details	I can viewthe value of total products in the stock	Medi um	Sprint -2
		USN-9	As a user, I can check the highdema ndproduct details	I can update salesdetailsof the products	High	Sprint -2
		USN-10	As a user, I can generate the invoice details	I can add incoming stockdetails	High	Sprint -1

6. ROJECT PLANNING& SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Retailer	USN-1	The retailer can search for the stocks whatever he/she want and order them based on his/her requirement.	20	High	BABU R LATHA S SURIYA KALA B ARUN M
Sprint-2	Inventory Manager	USN-2	The role of the inventory manager is to check out the database about the stock and have a track of all the things that the users are purchasing.	20	High	BABU R LATHA S SURIYA KALA B ARUN M
Sprint-3	Chatbot	USN-3	The retailers can directly talk with the chatbot regarding the stocks available in the inventory. Get the recommendations based on information provided by the retailer.	20	High	BABU R LATHA S SURIYA KALA B ARUN M
Sprint-4	Final delivery	USN-4	Container of the applications using docker, Kubernetes and deployment of the application.	20	High	BABU R LATHA S

6.2 Sprint Delivery Schedule:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story PointsCompleted (as onPlanned End Date)	Sprint ReleaseDate (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	07 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	10 Oct 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	15 Oct 2022

6.3 Reports from JIRA

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</> Code

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📑 Add shortcut

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Epic ˅

Insights

▾ **Sprint 4** 14 Nov – 19 Nov (4 issues)   0 0 0   Start sprint ...
GPS tracking System

🔖 ~~SSFR-22~~ As a developer , I can create web page to view train status using Node RED   DONE ˅ 👤

🔖 ~~SSFR-23~~ As a developer I can extract details from IoT device using python code and IBM watson.   DONE ˅ 👤

🔖 ~~SSFR-24~~ As a developer, I can upload the details to cloud and display it to user by connecting it with Node RED a...   DONE ˅ 👤

🔖 ~~SSFR-25~~ As a passenger ,I would like to receive updates over my train status during my journey via fast SMS or Ap...   DONE ˅ 👤

\+ Create issue