



RETAIL STORE STOCK INVENTORY ANALYTICS

NALAIYA THIRAN - PROJECT REPORT

PROJECT ID:PNT2022TMID00800

Submitted by

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PANIMALAR ENGINEERING COLLEGE, CHENNAI-600123.

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BONAFIDE CERTIFICATE

Certified that this project report

“RETAIL STORE STOCK INVENTORY ANALYTICS- PNT2022TMID00800”

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1 INTRODUCTION:

Today, people are shopping in ways never before imagined as they piece together the online and in-store shopping experience to best meet their needs. It's more important than ever to meet your customers where they prefer to shop and put them at the centre of your marketing and customer experience. In this guide, you'll learn how to better connect with customers on these new shopping journeys and drive more sales. We've collected the most useful tools, product recommendations, and consumer insights to help you achieve your business and marketing objectives. Whether you're looking to optimise your existing marketing mix or make a game plan for the holiday season, this guide has you covered. Inventory management is an essential part of running a successful retail business. It's important to have a solid strategy to avoid overselling, stocking out, and keeping track of your inventory levels. The project contains the dashboard, report and story. Embed dashboard, report and story in html page and web app.

1.1 PROJECT OVERVIEW:

The retail industry has gone through tremendous technological changes in the past few decades. The advent of e-commerce and online retail websites has pushed retail companies to embrace technology. However, few companies still employ traditional business methods. Eventually, only those companies which adopt technology can optimise their business growth. Paper based processes can curb the growth of your retail business. Especially, inventory Management without the use of technology can be cumbersome. Inventory is a vital aspect of any retail enterprise. If it is not managed efficiently, it could have a ripple effect on other retail in-store processes. The retail inventory management software would help you handle complex inventory processes easily. The retail world involves constant competition, to get consumers' attention, and ultimately convince them to make a purchase. This is why you need retail inventory software that makes life behind the scenes easier and more automated. With automation in production, simplified stock tracking, and integrations for sales, accounting, and shipping. It's ideal for owners who want a wider view of their business, and more time to focus on long-term growth. Paper-based retail inventory management can take a lot of time and effort. The retail inventory management software can cut short your in-store inventory process cycles through automation. Automation would give you time to focus on other productive business tasks. Retailers are witnessing a historic shift in the way consumers shop. Today's consumers can

easily compare prices, research products, and make purchasing decisions that align with their lifestyle. Whether online or instore, retail customers have come to expect shopping experiences to be personalised to their unique needs and preferences, order fulfilment and returns that are hassle-free, and responsive customer service available via multiple channels. Analytics for retailers enables a data-driven approach to meet these expectations. Online retail inventory management Empty digital store shelves represent lost sales opportunities and can cause customers to migrate to competitors who are able to consistently keep desired products in stock. With potentially hundreds or thousands of items for sale, traditional threshold based models of inventory management are not sufficient..

1.2 PURPOSE:

Saves Time Paper-based retail inventory management can take a lot of time and effort. The retail inventory management software can cut short your in-store inventory process cycles through automation. Automation would give you time to focus on other productive business tasks

PROCESS EFFICIENCY

Inventory management is one of the crucial retail processes. Thus, any discrepancy in the inventory control would impact all other operations in your company. The retail inventory software can streamline the inventory processes, which would, in turn, improve the efficiency of your entire business.

COST-EFFECTIVE

Manual inventory control would increase your labour and process costs. The software would not only help you save time, but it would also help you reduce costs. As a result, the profitability of your business would improve. Also, you can invest the excess funds in activities that promote your business growth.

2 LITERATURE SURVEY:

2.1 EXISTING PROBLEM:

UNCLEAR COMMUNICATION

Even in straightforward business processes, miscommunication can cause irreversible damage to efficiency. You can only imagine the far-reaching impact it would have on a complex and multifarious process, like inventory management. As inventory management has numerous components, clear communication is vital for a seamless flow. For instance, having the correct prices is critical to print the price labels for the products in the inventory. However, if an update in the prices is not communicated before printing the labels, the products would go out with the wrong price labels. The revisions for such errors would take a lot of time. Furthermore, if the miscommunication is not detected in time, it would affect the sales and profitability of the company. Automation can help you streamline your communication flow across the departments. A retail inventory automation software would provide real-time information about the inventory. Correct and timely information would decrease events of miscommunication.

INADEQUATE ACCESS

Generally, insufficient access to information would lead to miscommunication issues. Every department needs to have access to data that is crucial to their processes. Hence, the impact of the lack of proper access is not limited to individual processes. But it also affects the complete retail inventory management. In the absence of adequate access, your team would resemble disconnected groups. Lack of access would leave them uninformed, which, in turn, affects their productivity. Therefore, better access would improve the efficiency of inventory and other business processes. You can simplify your accessibility issue with retail inventory management software. The software can efficiently manage the access of the users, which would, in turn, improve the quality of the process.

INEFFICIENT WAREHOUSE MANAGEMENT

Warehouse management is a core component of brick-and-mortar retail inventories. Hence, ineffective warehouse management would affect the complete retail inventory process. A decentralised inventory management system would comprise the accuracy of the operations. Many aspects of warehouse management would be vulnerable to errors without

integrated software.

SPOILED GOODS

Inventory management is more complicated for retail companies that deal with perishable goods. Expiration dates become crucial in the inventory tracking process. Inefficient inventory tracking can cause considerable stock and monetary loss for retail businesses. For instance, the warehouse staff sends out a shipment of products with a later expiration date while warehousing considerable stock with an earlier expiration date. This error would not only hamper the process cycle but would also increase the risk of spoilage of the product with an earlier expiration date. You can manage this issue with the introduction of technology. A retail inventory management solution can track the status of perishable goods and help you reduce spoilage.

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2.2 PROBLEM STATEMENT DEFINITION

Effective loss prevention and asset protection efforts are essential to minimising these values—known as stock loss, inventory shrink or simply shrink—and preserving profitability. The challenge is a significant one, however, because while robberies are relatively infrequent for the average business, shoplifting/ORC and employee theft can accommodate for more than two-thirds of shrink. Human error, paperwork snafus, spoilage, and other factors account for the remaining third. With inventory levels under assault in both cyberspace and the real world, effective inventory management requires a sophisticated and strategic approach in order to recover value—or prevent its loss in the first place.

- Slow order fulfilment
- Shipping errors
- Inaccurate or incomplete returns
- No connection between purchase orders, shipping documents, and invoices sent
- High storage costs and less space for more successful products due to excess inventory

3 IDEATION & PROPOSED SOLUTION

3.1 IDEATION & BRAINSTORMING

STEP-1: TEAM GATHERING, COLLABORATION AND SELECT THE PROBLEM STATEMENT

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

To give the best data presentation to improve Retail stores and avoid over stock and out of stock



Key rules of brainstorming

To run an smooth and productive session



Stay in topic.



Encourage wild ideas.



Defer judgment.



Listen to others.



Go for volume.



If possible, be visual.

STEP-2: BRAINSTORM, IDEA LISTING AND GROUPING

2

Brainstorm

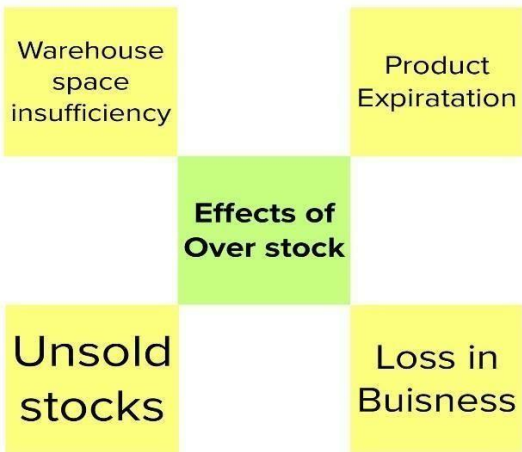
Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

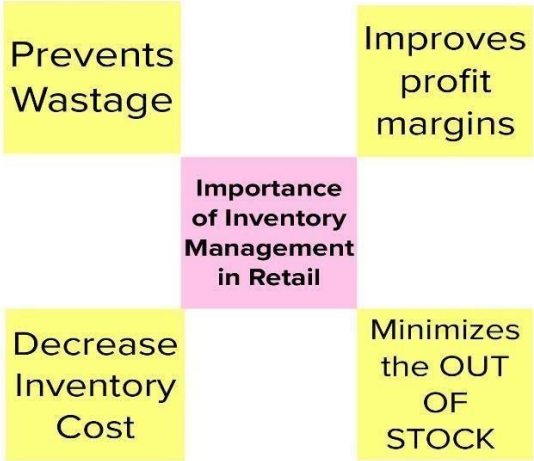
TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

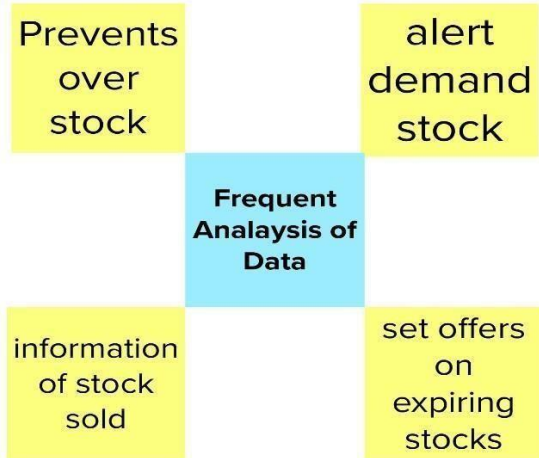
Lalith Aditya



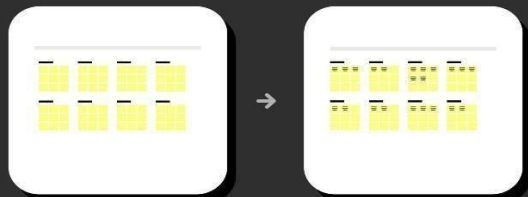
Manoj Kumar



Abdullah



Mohanraj

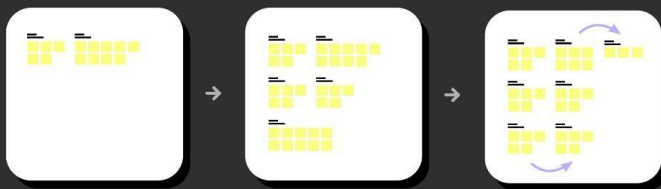
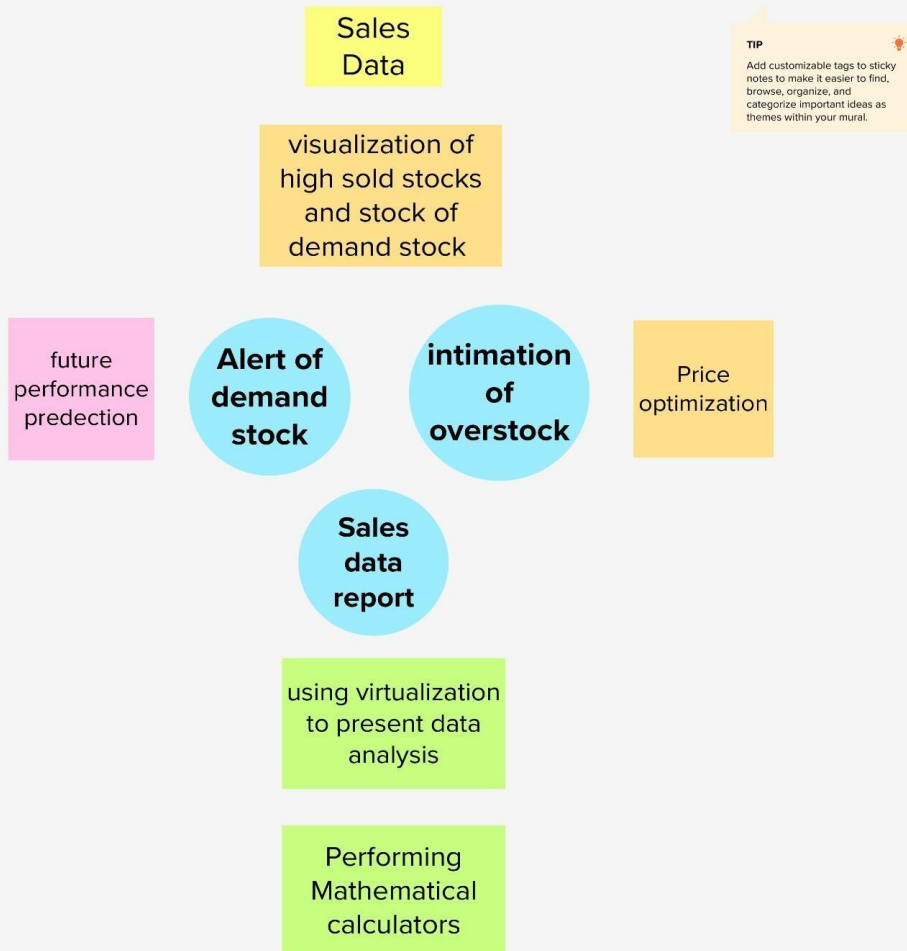


3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

⌚ 20 minutes



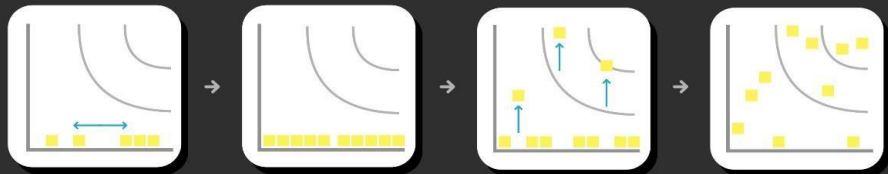
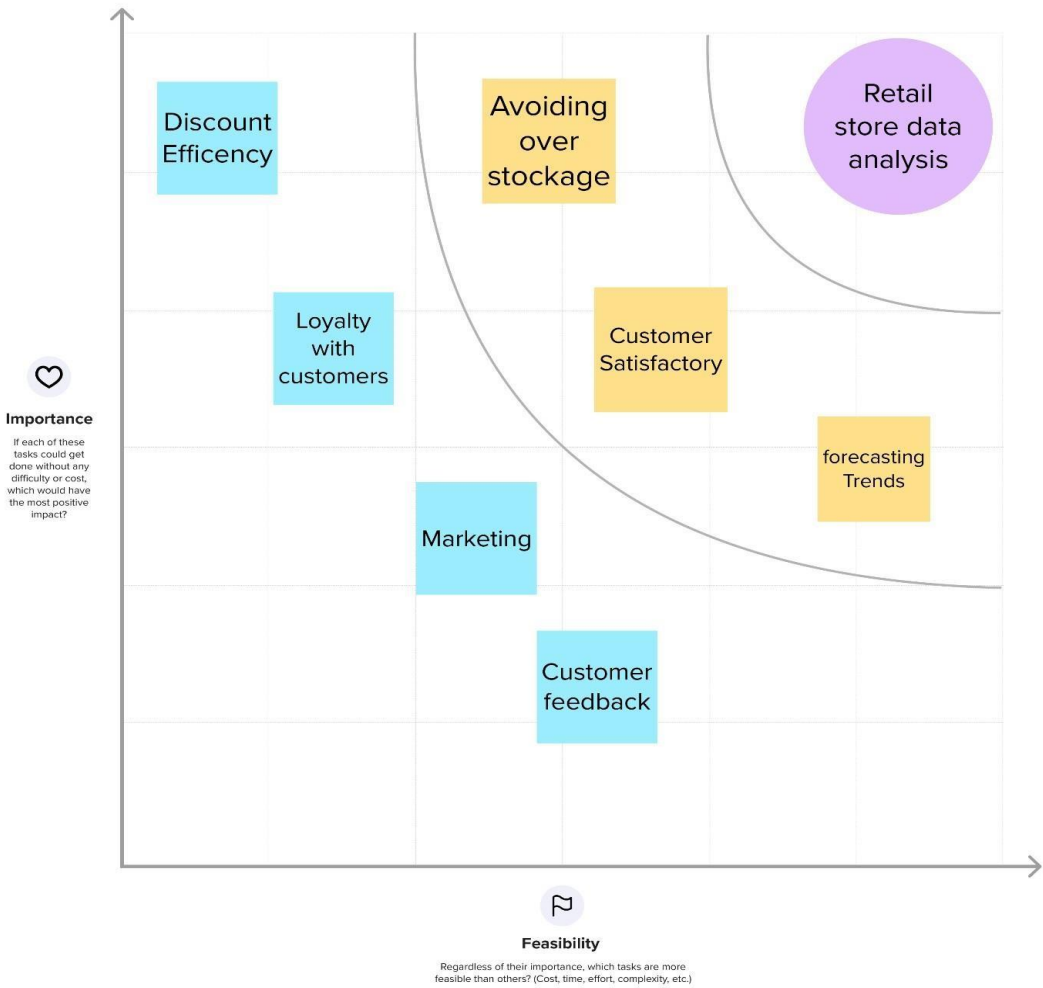
STEP-3: IDEA PRIORITIZATION

4

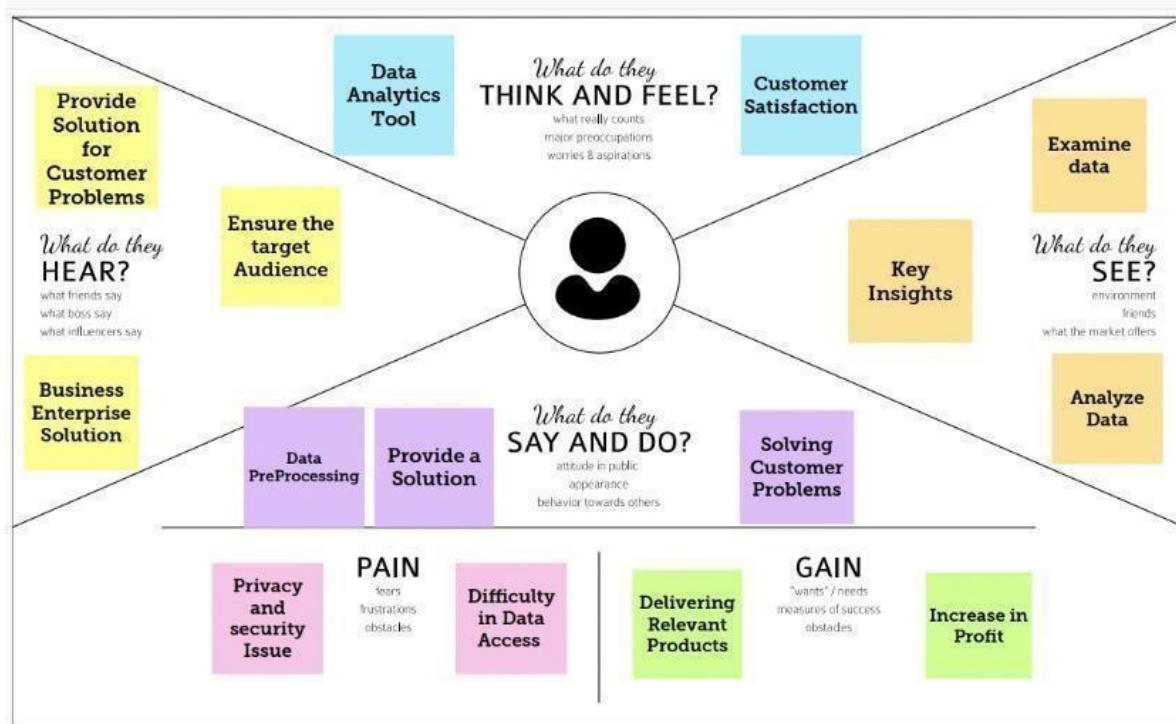
Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



3.2 EMPATHY MAP CANVAS



4 REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Online Food Delivery System

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Registration	Registration through app. If customer wants to order the food He/she must be registered, unregistered customer can't for ordering.
FR-2	Login	Login through valid user id. Login through valid password for ordering.
FR-3	Display the Menu	In this system all the items are displayed with Their rates.
FR-4	Modify Menu	System can make changing in menu like adding or removing food items which are not available.
FR-5	Select food item's	Items are selected customer feel free to Order.
FR-6	Changes to order	The customer can make changings in order like He/she can delete or add food items in order.
FR-7	Review the order before Submitting	Customer Name, Phone number, Location (address), and placed order, then finally order is submitted.
FR-8	Payment	For customers there are many type of secure billing will be prepaid as debit or credit card, post paid as after delivering, check or bank draft.
FR-9	Provide delivery and payment details	Here bill is generated, order No, and payment is given and confirmation of delivery is done.
FR-10	Logout	After the payment or surf the product the customer will logout.

4.2 Non-Functional requirement

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	System should be easily used by the customer.
NFR-2	Security	Application should not be most vulnerable to any exploitation. That is strict authentication mechanisms to be applied to the system.
NFR-3	Reliability	The ability of the system to behave consistently in a user acceptable manner when operating within the Environment for which the system was intended.
NFR-4	Performance	Online food delivery application to order food that provides instant delivery for food. The app should be able to handle the load of many users at peak hours where maximum orders placed should be a particular minute. Performance should be fast.
NFR-5	Availability	The system should be available at all times, meaning the user can access it using a web browser, only restricted by the down time of the server on which system runs.
NFR-6	Scalability	Which an application performance is measured in terms of its ability to scale up or scale down the number of users requests or other such performance measure attributes. Scalability can be performed at a hardware, software, or database level.

5 PROJET DESIGN PHASE-I

5.1 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The example used here will be a Fruit shop owner who's owning a small shop and a small inventory and the problem faced by him/her is how to manage the inventory of the goods as per the demand and the goodness of the fruit.
2.	Idea / Solution description	<ul style="list-style-type: none">• As per inventory management software we can see which stock is having the most movement and which has the least and restock according to the need.• if the stock(fruit) is starting to enter the rotting stage then the vendor can move that stock to another processing industry(juice shop)where there they will process and sell it in another model
3.	Novelty / Uniqueness	<ul style="list-style-type: none">• Let it be restocking of stocks according to the demand we can priorly identify what season is coming and what fruit will be mostly demanded for and stock it according to the need.• The unique idea from this model will be if the fruits start entering into the rotting stage then the software will update it and place an alert to move that stock out to another person (juice stall) so that the fruit is not wasted completely.
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none">• By this solution method the customer will always get a fresh and perfect fit goods according to their need be it fresh fruit or be it a fruit juice.• A positive awareness will be spread on not to waste any food items.

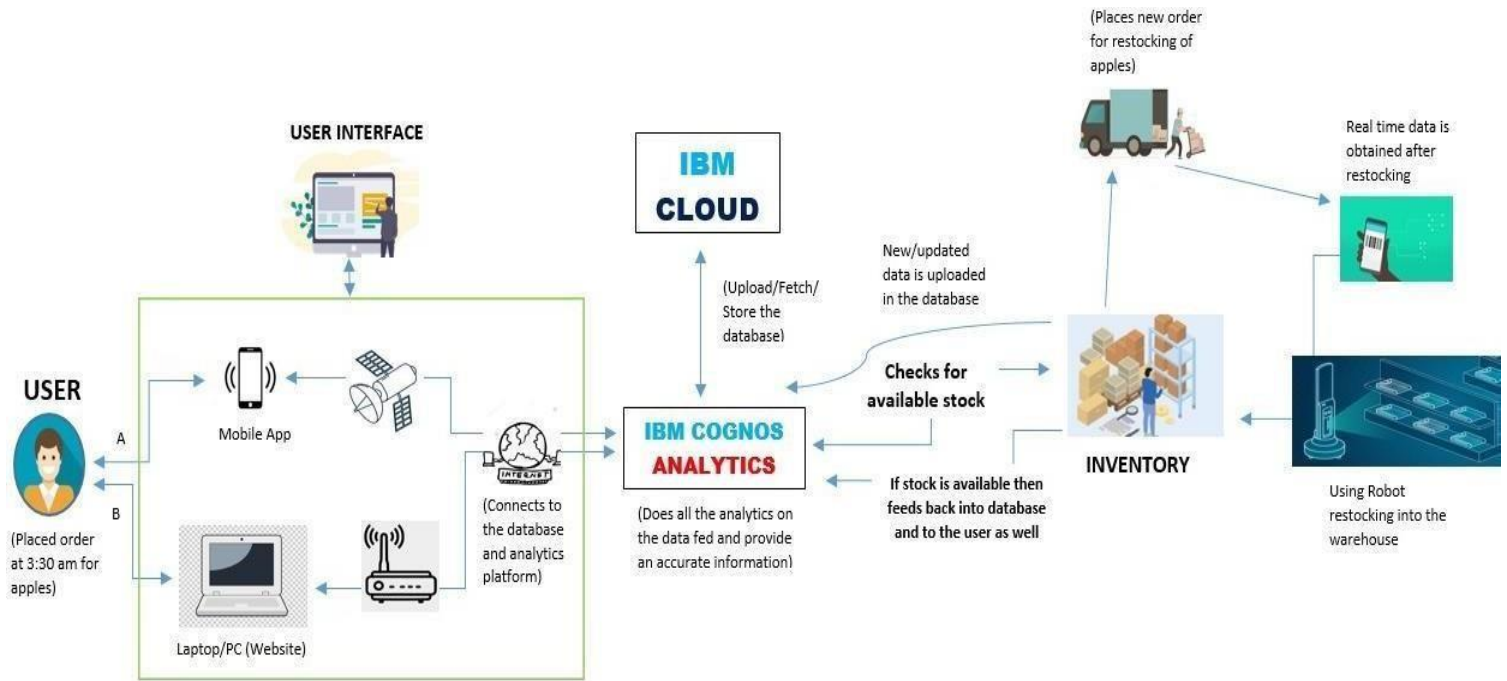
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> • This idea business model will increase the number of sales in accordance to quantity of stock available because the stocks are only stored in the warehouse depending only upon the demand from the customers. • If suppose the the vendor buys the banana(per dozen) for Rs.5/dozen there will be revenue here from two different ways : <ol style="list-style-type: none"> a) Will be by selling the fresh bananas directly to customer at a good amount of margin keep it Rs.14/dozen. b) The other will be if the banana starts approaching the rotting stage then the stock can be sold to the juice vendor at a lesser margin keep it Rs.7/dozen. • This method will result in comparatively no loss from the price of stock bought from the only the profitability will change depending on how much margin it sells of the above two.
6.	Scalability of the Solution	<p>The scalability on this model is high as there involves no wastage of food and the inventory space can be managed very efficiently and since the percentage of loss occurring is very less compared to other models and it is very suitable for small fruit shops.</p>

5.2 PROBLEM SOLUTION FIT

Problem-Solution Fit

Define CS, fit into CL	1. CUSTOMER SEGMENT(S) Who is your customer? The customer here is a "Fruit Shop Owner"	6. CUSTOMER LIMITATIONS <small>EG. BUDGET, DEVICES</small> What limit your customer to act when problem occurs? Spending power, No cash in pocket, Risk factor to an extent.	5. AVAILABLE SOLUTIONS <small>PLUSES & MINUSES</small> What solution are available to the customer when he/she is facing the problem? What he/she tried in the past? <ul style="list-style-type: none"> The sudden changes in demand which is directly proportional to the price surge can be identified previously and stocked accordingly. He/she tried to predict the surges and drops according to what they only experienced. 	Explore AS, differentiate
	Focus on PR, tap into BE, understand RC	2. PROBLEMS / PAINS <small>+ ITS FREQUENCY</small> Which problem do you solve for your customer? <ul style="list-style-type: none"> Periodic changes according to season Daily Transportation costs Locating the warehouse for restocking Short life of the fresh fruits Sudden surge in prices based on demands 	9. PROBLEM ROOT / CAUSE What is the root of every problem from the list? <ul style="list-style-type: none"> People think that managing a inventory through a digital form will be difficult and the managing the software will cost too much money. People have kept a mindset that increase/decrease of demand cannot be predicted before itself. 	
Identify strong TR & EM		3. TRIGGERS TO ACT What triggers customer to act? <ul style="list-style-type: none"> Seeing the immense wastage of fruits due to less sales Reading about innovative ideas on better management on the internet. 	10. YOUR SOLUTION <ul style="list-style-type: none"> Analysing the previous year climatic changes will determine the grocery's demand and that will create a good path to invest in right fruits Monitoring and predicting the ups and downs in market by previous year statistics will helps us to make a alternative changes in the field. Always have a plan b for storing the stocks in warehouse will help us to get avoid in some emergency situation. 	8. CHANNELS of BEHAVIOR Online Advertise with financial influencers to spread awareness and promote it. Offline A person who belongs to the work he should have or create some social contacts in his/her surrounding that's will create a certain trust worthy things in his business
	4. EMOTIONS <small>BEFORE / AFTER</small> Which emotions do people feel before after this problem is solved? <ul style="list-style-type: none"> Frustration, helplessness, demotivated Satisfaction, Confident, Calm state of mind. 			

5.3 SOUTION ARCHITECTURE



6 PROJECT PLANNING

The planning process requires a thorough look into the Retail Store motives to determine what strategies to implement. While it may be time-consuming, drafting a detailed plan is essential for successful execution. Retailers can begin by following seven general steps-

SET GOALS

Businesses need to set specific short and long-term goals. Instead of setting a general objective to increase sales, management should set benchmarks regarding which product performances need to improve, specific revenue goals, and ideal profit margins for each item. Retail Store can further break down their goals into two categories

INTERNAL OBJECTIVES

Retail management should pull reports and set practical sales and revenue goals based on product performance. Organisations can set clear monthly, quarterly, and annual targets to motivate employees and keep them focused on boosting sales.

EXTERNAL OBJECTIVES

External goals refer to a retailer's overall performance according to customers and their experience. This can include customer service, retention, loyalty, and product pricing. Retail stores should aim to create a personalised experience that attracts and generates returning customers.

ANALYSE THE MARKET

Once the company's objectives are clearly defined, it is time to analyse the current market. Research can expose competitors' strategies, performance, and weaknesses, as well as

consumer expectations. This allows companies to develop a plan of action that fulfils customer needs and stands apart from the competition.

Research can also define any risks and opportunities the Retail Store may be exposed to and how to respond. Retailers can anticipate upcoming events through risk management and planning, so they are not caught off-guard. Through this process, businesses can analyse their own strengths and weaknesses, allowing them to improve the necessary areas. This may include financial planning, resource allocation, and staffing.

6.1 SPRINT PLANNING & ESTIMATION

Sprint planning is an event in scrum that defines what can be delivered in the upcoming sprint and how that work will be achieved. The sprint is a set period of time where all the work is done. However, before you can leap into action you have to set up the sprint. You need to decide on how long the time box is going to be, the sprint goal, and where you're going to start. The sprint planning session kicks off the sprint by setting the agenda and focus. If done correctly, it also creates an environment where the team is motivated, challenged, and can be successful. Bad sprint plans can derail the team by setting unrealistic expectation

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	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application.	1	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-2		USN-3	As a user, I can register for the application through Facebook.	2	Low	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-1		USN-4	As a user, I can register for the application through Gmail.	2	Medium	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password.	1	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-2	Dashboard	USN-6	As a user, I can access the dashboard after successfully logging in.	2	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D

6.2 SPRINT DELIVERY SCHEDULE

In Agile product development, a sprint is a set period of time during which specific work has to be completed and made ready for review. Each sprint begins with a planning meeting. During the meeting, the product owner (the person requesting the work) and the development team agree upon exactly what work will be accomplished during the sprint. The development team has the final say when it comes to determining how much work can realistically be accomplished during the sprint, and the product owner has the final say on what criteria need to be met for the work to be approved and accepted. The duration of a sprint is determined by the scrum master, the team's facilitator and manager of the Scrum framework. Once the team reaches a consensus for how many days a sprint should last, all future sprints should be the same. Traditionally, a sprint lasts 30 days. After a sprint begins, the product owner must step back and let the team do their work. During the sprint, the team holds daily stand-up meetings to discuss progress and brainstorm solutions to challenges. The project owner may attend these meetings as an observer but is not allowed to participate unless it is to answer questions. (See pigs and chickens).

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Upload Dataset	USN-7	As a user, I can upload dataset from the device that is being used.	3	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-3		USN-8	As a user, I can view the monthly sales of stock for the dataset.	3	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-3		USN-9	As a user, I can view the monthly sales of stock for the dataset.	4	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-3		USN-10	As a user, I can view the monthly revenue of the stock for the dataset.	4	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-4		USN-11	As a user, I can view the summary of the retail stock dataset.	4	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-4	Analyse	USN-12	As a user, I can analyse and find which products are low in stock and it's availability.	5	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D
Sprint-4	Prediction	USN-13	As a user, I see the prediction of the specific product's future sales expectation.	5	High	Lalith Aditya V H Manoj kumar T Mohamed Abdullah A Mohanraj D

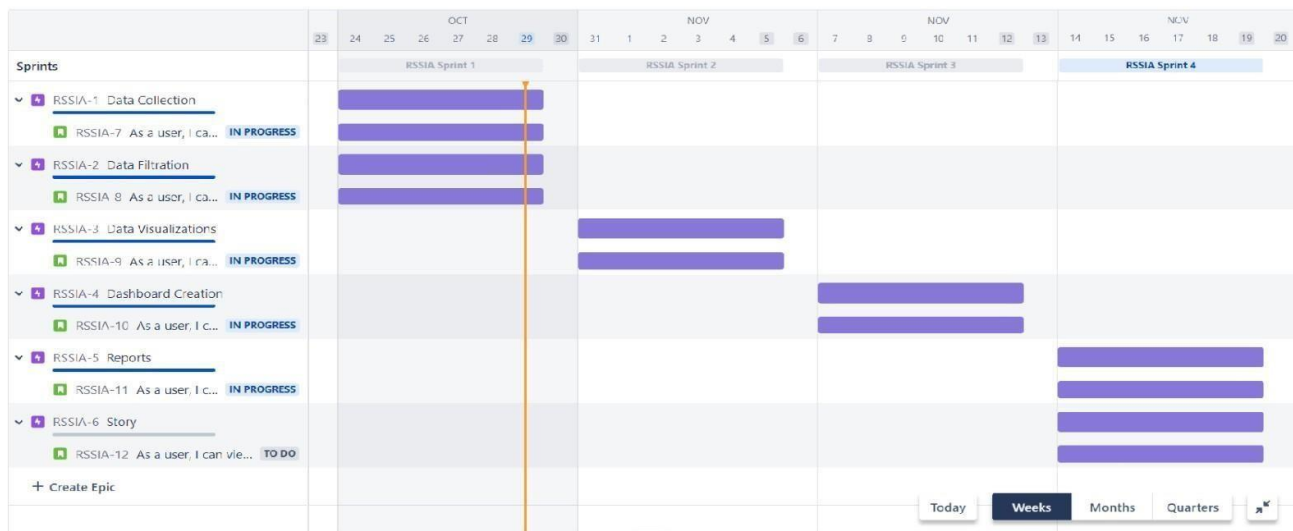
VELOCITY

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	20	6 Days	24 Oct 2022	29 Oct 2022	6	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	8	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	10	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	14	19 Nov 2022

REPORTS FROM JIRA

The Jira is very useful for creating milestones which shows the project sprint timelines clearly; the sprints are planned and completed within the given time limit.

PLANNING TOOL:



Backlog

 Epic ▾

Insights

▼ Backlog (6 issues)

0 0 0 Create sprint

RSSIA-12 As a user, I can view the product description and more additional information about it. STORY	TO DO ▾	
RSSIA-11 As a user, I can view the list of categorized products and their details as a report. REPORTS	IN PROGRESS ▾	
RSSIA-9 As a user, I can visualize the data in an easy manner. DATA VISUALIZATIONS	IN PROGRESS ▾	
RSSIA-10 As a user, I can view my dashboard and can perform stock prediction and analysis. DASHBOARD CREATION	IN PROGRESS ▾	
RSSIA-7 As a user, I can view the data which is clean for visualization. DATA COLLECTION	IN PROGRESS ▾	
RSSIA-8 As a user, I can view the filtered information. DATA FILTRATION	IN PROGRESS ▾	

7 CODING & SOLUTIONING

7.1 FEATURE 1

Centralized inventory management

One of the most important functions of the inventory management system is that it tracks all of the information about the inventory. An inventory management system effectively keeps a good track of the stock levels, history of the product as well as many other product specifications. One of the greatest features of the inventory management system software is that it syncs with other modules of the inventory system. This assists in the operation of the inventory system accurately.

Tagging and Barcoding

Another great feature of the inventory management system is the elimination of standard human errors. Manual data functioning can cause errors, but scanning the barcode saves ample time for workers. The barcoding feature reduces employee training sessions and budget value.

Traditionally, recording the data of the products requires so much effort. The inventory management system has made it easier by offering barcoding and tagging features. Now, the bulkiest work is completed in the least amount of time. Thus, inventory management system software lets you track the products efficiently with the help of tagging and barcoding.

Reporting of the business activities

One of the most advantageous tools of an inventory management system is the reporting of various business activities. Management of an inventory business demands people in charge to remain updated regarding various business activities such as the driver's location, the status of the product, information regarding the shipment of the order, etc. You can integrate many tools in the inventory management app for carrying out the reporting of tasks efficiently.

Forecasting of the inventory

It is a quite discomfoting situation when company products go out of stock. An inventory management system allows you to check what products get out of stock, and what products are abundantly available in the stock of the company. This is a uniquely beneficial way of maintenance of a good user experience as well as spending resources wisely. Consequently, business owners purchase the business inventory smartly and intelligently. This feature of the inventory management system helps managers in meeting customer expectations and reduction of stock out risks.

7.2 FEATURE 2

Alerts regarding the inventory details

The manual work inventory supervision days are bygone. Now, managers do not have to spend a good amount of time and energy on the management of the stock data. A great inventory management system is one with a stock-out alert feature. In the alerts, the software describes various consequential issues that may occur due to reduced stock of a particular item.

Backup and security of the inventory

No matter the type of your business, proper backup, and security of the inventory is critical for the functioning of the inventory. Inventory management systems software has good security layers that make hacking impossible. In case inventory software gets hacked, the data has a backup that business operators can access and use. So, backup and security of the inventory prevent any hiccups.

Internet of Things (IoT) and Cloud data software

Inventory management system is cloud-based software, which can be accessed from all types of devices. Also, inventory management system software is IoT-driven, which makes it easier to record all the details of the inventory intelligently and smartly.

IoT keeps the inventory optimized and organized efficiently. All of the employees of the company can get real-time updates.

Integration of inventory management software with other systems

Nowadays, companies have installed an ERP system that has increased the productiveness of the companies to a greater extent. If inventory management systems software can be integrated with ERP, the company can benefit a lot from the integration. Data can be retrieved relentlessly from the system.


Optimized inventory


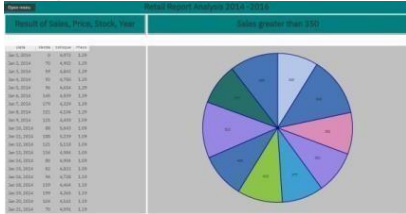
Another great feature of the inventory management software system is that it optimizes and organizes the inventory of companies. It becomes easier for the managers to function and meet deadlines with the optimized inventory.

8 TESTING

8.1 TEST CASES

Model Performance testing

S.No	Parameters		Screenshots/Values
1.	Dashboard Design		<p>The dashboard is created with three category i.e. Overview, Sales, Price.</p> 
2.	Data Responsiveness		<p>The data is downloaded from an external API and uploaded in the IBM Cognos analytics with Watson and a data module is created</p>
3.	Amount Data to Rendered		<p>The dataset which is downloaded from the external API and uploaded is rendered from the DB2.</p>

4.	Utilisation of Data Filters		The data filters are used for preprocessing the data i.e cleaning of data , removing the null value.The unwanted columns are removed fromthe dataset and the additional data which are required are added to the dataset.
5.	Effective User Story		<p>The story is created with two scenes i.e. Introduction, sales by year & stock.</p> 
6.	Descriptive Reports		<p>The report is created with two visualisationsi.e.result, sales greater than 350.</p> 

8.2 USER ACCEPTANCE TESTING

Purpose of document

The purpose of the document is to give a clear view on what needs to be done i.e. the target and what is done and what are the things required to achieve the goal. The functional and User Application Interface is given under the feature type. The objective is given under the components column. The steps which need to be performed to achieve the goal is given under the Steps to execute column. The data which need to be tested is given under the test data column. The result or final objective which need to be achieved or attained are given under the expected result. The outcome which is actually attained is given under the actual result column. The status column contains whether the test is passed or fail. If in case the test failed the details of it has to be filled in the comments column. The automation of the test case has to be filled in the TC for automation which is denoted by “yes” or “no”. If in case the test failed the bug which occurred has to be given with its ID in the bug ID column. The person who performed the respective action is given under the executed by column

Test Case Analysis

Section	Test Cases	Not Tested	Fail	Pass
Dataset	5	0	0	5
Dashboard	8	0	0	8
Report	2	0	0	2
Story	5	0	0	5
Embed dashboard, report and story in simple .html file	15	0	0	15
Embed dashboard, report and Story in web app	25	0	0	25

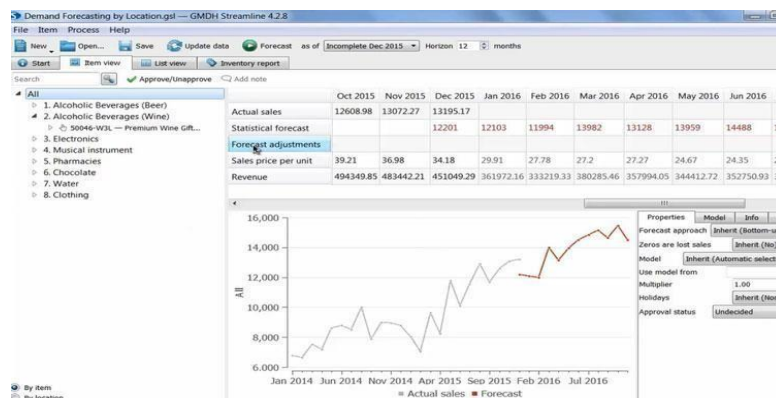
9 RESULT

9.1 PERFORMANCE METRICS

The following are the five most effective inventory KPIs and metrics:

1. Demand Forecast Accuracy

An excellent inventory management metric for determining how strong collaboration is in a manufacturing operation, demand forecasting reflects the variation in real or actual demand and what is estimated at the factory level. Inventory metrics for manufacturing can make operations more effective by closing the gaps between forecasted demand and actual demand.



Use demand forecasting to plan inventory and forecast revenue.

This inventory metric also contributes directly to reducing inventory carrying costs, a key indicator of inventory management effectiveness. With demand forecasts on hand, you're less likely to order inventory beyond market demand. Further, demand forecasts can also clue you in on when to order more stock than normal, so you never miss a chance for growth.

2. Customer Satisfaction Levels

Often measured in net promoter scores (NPS), customer satisfaction levels need to be evaluated across all distribution and selling channels. Best-in-class manufacturers measure selling and distribution separately, determining an NPS for each channel. This is to index your customers' order-to-delivery times and check to see if they're consistent with what you originally expected.

3. Perfect Order Performance

Perfect order performance quantifies how effectively an organization delivers complete, accurate and damage-free orders to customers on time. The equation that defines the perfect order index (POI) or perfect order performance is: (percent of orders delivered on time) * (percent of orders complete) * (percent of orders damage free) * (percent of orders with accurate documentation) * 100.

DIFOT, or delivered in full and on time, is a critical KPI for purchase orders. But it can be a bit misleading if manufacturers assess it individually instead of using it in the POI formula above. The more configurable products are, the more difficult perfect order performance is to attain. However, the rapid growth of manufacturing intelligence is making perfect order performance more attainable than ever across the spectrum of production strategies.

4. Fill Rate Effectiveness as a Percentage of All Orders

Measuring supply chain collaboration needs to be a priority when selecting inventory metrics and KPIs to manage your operation. Tracking fill rate effectiveness as a percentage of all orders directly reflects how many orders or requests for material from production centers are fulfilled. Taking this metric a step further provides insights into how well production centers are managing inbound inventories to meet customer delivery dates.

5. Gross Contribution Margins by Product, Production Facility and Business Unit

Best-in-class inventory management solutions provide gross contribution margin (GCM) performance levels across several different dimensions of business. GCM is one of the most effective metrics a business can use to evaluate how well collaboration is happening across business units. If you know the GCM attributable to a given production center, you can track performance and effectiveness levels by location.

10 ADVANTAGES AND DISADVANTAGES

Advantages

- An advantage of the retail inventory method is that it does not require a physical inventory. The retail inventory method only requires an organization to record the retail prices of inventory items.
- If an organization has multiple locations in different cities and states, performing a physical inventory can become a costly and time-consuming undertaking. By using retail inventory, an organization can prepare an inventory for a centralized location.
- The retail inventory method also allows the organization to create an inventory value report for budgeting or the preparation of financial statements.

Disadvantages

- On the other hand, the retail inventory method is only accurate if all pricing across the board is the same and all pricing changes occur at the same rate. In most cases this is not realistic in retail because of the many variations that exist in merchandise pricing.
- For example, depreciation, markdowns, product damage and theft can affect the price of the retail inventory.
- For this reason, any calculations made using the retail inventory method should serve only as an estimate.

11 CONCLUSION

For the success of the program, the managers of the retail stores must formulate a modern way of managing the inventory by instituting electronic systems to take care of the resources of the company. This ensures that they can be accounted for and there are proper records available all the time for reference to be made when the need arises. Besides, the retail management system is necessary for ensuring that there is accountability in the way the company handles its stock. It helps in saving time.

Retail companies have acquired significant importance within several countries due to their high economic contribution. Therefore, the need to analyze their KPIs becomes highly significant, as well as their different systems, methodologies, and tools used within inventory management and optimization. From the aspects mentioned above, the main trends in inventory management within companies were define.

12 FUTURE SCOPES

New inventory management skills

As stock control advances, inventory managers need new skills to match them.

Besides organizational skills and general computational skills in math, data analytics, and forecasting, inventory managers in 2019 will need to learn bits and pieces of topics like:

- Coding and algorithms (you may need to insert a few lines of codes here and there.)
- Application programming interfaces (APIs).
- Enterprise resource planning (ERP).
- New reporting technologies (they keep improving; you want to keep up with them.)

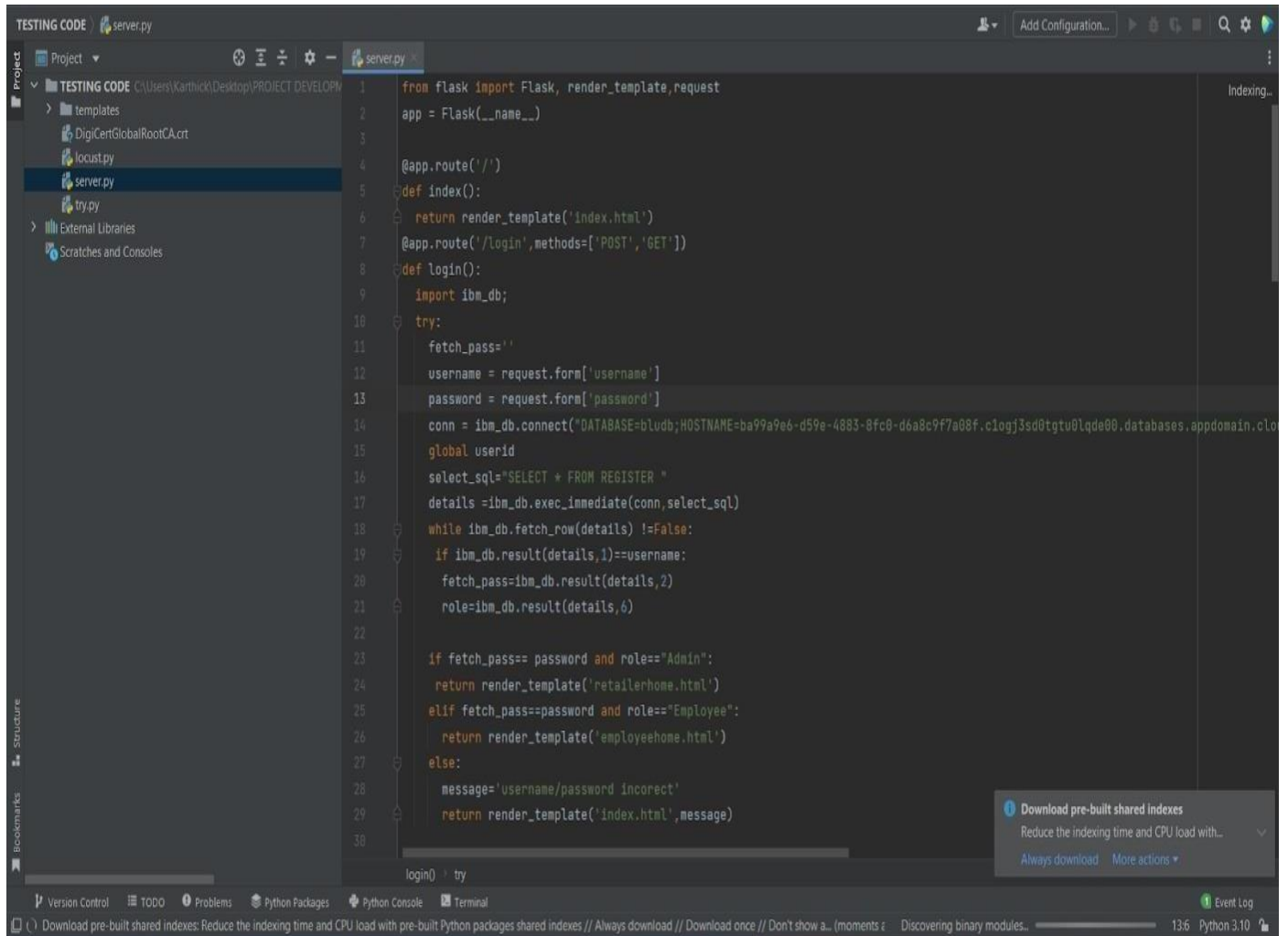
As an inventory manager or store operator or owner, you may not need to know these skills too in-depth, but a basic knowledge of them is necessary.

Inventories that power experiential retail

- Experiential retail is a trend that's catching fire — especially in the past few months.
- In fact, they keep popping up in the news section of Google search results:
- The concept of consumers being in an exciting and relaxed place because a brand is becoming one of the strongest arms of retailing today. But as experiential retail grows in prominence and usefulness, the inventories that power them grow as well.
- For example, Nordstrom launched “Nordstrom Local” — a new line of smaller stores, with its first in West Hollywood, California. They didn't design the store to sell anything; it's simply an inventory that powers experiential retail for Nordstrom.
- According to [CNBC](#), “Nordstrom Local will have eight dressing rooms where shoppers may try on clothes, but stores won't actually keep inventory for purchase in stock.”
- The stores also have bars where shoppers can order drinks.
- “Shopping today may not always mean going to a store and looking at a vast amount of inventory,” Shea Jensen, Nordstrom's senior vice president of customer experience, explains. “It can mean trusting an expert to pick out a selection of items.”
- From brands like Amazon and Apple to backyard restaurants, every store is launching its own experiential retail initiatives in whatever way possible.

13 APPENDIX

SOURCE CODE



```
1 from flask import Flask, render_template, request
2 app = Flask(__name__)
3
4 @app.route('/')
5 def index():
6     return render_template("index.html")
7
8 @app.route('/login', methods=['POST', 'GET'])
9 def login():
10     import ibm_db
11
12     try:
13         fetch_pass=''
14         username = request.form['username']
15         password = request.form['password']
16
17         conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=ba99a9e6-d59e-4883-8fc0-d6a8c9f7a08f.clogj3sd0tgtu0lqde00.databases.appdomain.clo
18         global userid
19         select_sql="SELECT * FROM REGISTER "
20         details =ibm_db.exec_immediate(conn,select_sql)
21         while ibm_db.fetch_row(details) !=False:
22             if ibm_db.result(details,1)==username:
23                 fetch_pass=ibm_db.result(details,2)
24                 role=ibm_db.result(details,6)
25
26             if fetch_pass== password and role=="Admin":
27                 return render_template('retailerhome.html')
28             elif fetch_pass==password and role=="Employee":
29                 return render_template('employeehome.html')
30             else:
31                 message='username/password incorrect'
32                 return render_template('index.html',message)
33
34 login()
35 try
```

GITHUB LINK

<https://github.com/IBM-EPBL/IBM-Project-3482-1658569370>