

# Department of Information Technology

A.P. Shah Institute of Technology

— G.B.Road,Kasarvadavli, Thane(W), Mumbai-400615

UNIVERSITY OF MUMBAI

Academic Year 2019-2020

A Project Report on  
**E-commerce Based Sales Prediction Framework**  
Submitted in partial fulfillment of the degree of  
Bachelor of Engineering(Sem-8)  
in  
**INFORMATION TECHNOLOGY**  
By

Tejal Tandel(16104047)  
Sayali Wagal(17204016)  
Nisha Singh(17204011)

---

Under the Guidance of  
  
**Project Guide: Rujata Chaudhari**  
**Project Co- guide: Vishal Badgujar**

# 1. Project Conception and Initiation

---

# 1.1 Abstract

The retail sector has widely adapted different inventory management applications and some retail chains even employ prediction software to analyze future sales.

However, a lot of day-to-day shopping in India happens through local shops. The owners of such mom-and-pop shops do not necessarily have the capital to invest in proprietary applications for setting up an inventory management system and a sales predicting software.

As a result, many of the shopkeepers end up hoarding a lot of irrelevant and nonprofitable products that lead to financial losses.

A very cost-effective and accessible solution for this problem is a web application that provides all the features of a pointof-sale system as well as gives future sales insights.

It will enable shopkeepers to manage their current product purchases and invoicing. The predictive sales analysis will help them to modify their investments on products and supplies thereby ensuring maximum profits.

# 1.2 Objectives

- To help retailers stock appropriate products based on the in-demand product sale.
- To help retailers make product-wise decisions like reordering or discarding the product.
- To generate a report on monthly sales so that retailers can analyse their expenses.

# 1.3 Literature Review

**Paper Title :** Performance prediction using modified techniques for retail.

**Authors:** Ezhilarasan C, Ramani S.

**Publication details :** Published on IEEE 2016

## **Findings:**

- Performance evaluation is based on the website traffic and conversion rates.
- These attributes are given as cluster inputs and evaluation is done using Fuzzy logic.

## **Advantages:**

- Fuzzy logic is efficient in prediction and sales analysis for particular clusters.
- Project can be hosted in any domain and it can be used in real-time environment.

## **Disadvantages:**

- Small amount of data cannot be computed.
- Precise transaction data is required everytime to predict the performance.

# 1.3 Literature Review

**Paper Title:** Demographic Transformation clustering of transactional data for sales prediction of convenience stores.

**Authors:** Xiaojun Zhang, Jisheng Pei, Xiaojun Ye.

**Publication details :** Published on IEEE 2016

## **Findings:**

- Extracting customer characteristics through transactional data.
- Two different data attributes, customer type proportion and category profit score, and two different algorithms, k-means and EM, to cluster.

## **Advantages:**

- Provides prediction results per category.
- Market Basket Analysis can be easily integrated with the model.

## **Disadvantages:**

- We can not forecast sales of a commodity precisely just according to its category .

# 1.3 Literature Review

**Paper Title:** Profit prediction using regression model for travel agents.

**Authors:** Rahmatika Santi, Masayu Leylia Khodra.

**Publication details :** Published on IEEE 2018

**Findings:**

- Model evaluation using linear regression

**Advantages:**

- The model uses independent variables to estimate profit as per the travel agent's required factor.
- This can give the cost estimation to travel agent to describe the value for target completion.

**Disadvantages:**

- The model uses cumulative data of variable to generate results.
- It is focused of transactional data.



# 1.4 Problem Definition

- Retailers face a loss in revenue due to improper investment and management activities. Many incur losses because their customer reach is limited. They cannot properly identify the demand of products and therefore end up buying limited products. On the other hand they can underestimate the growth of some products and remove them from their shop.
- All these cases lead to a financial loss and stagnate the shop's growth. If the shopkeepers are equipped with tools and applications that give them insights of their sales and recommend products to them, the shopkeepers can improve their finances.

## 1.5 Scope

- This project will be beneficial to bigger supermarkets as well, having vivid range products. It will save them the extra expenditure of purchasing a third party sales prediction software.
- The project can be expanded on Android and iOS platforms to make it more easy to use and thereby reduce the hardware space.
- This project can be exported as a bundle which can be installed privately into individual shops.

# 1.6 Technology stack

- Frontend:**

Bootstrap, HTML5, CSS3, JavaScript

- Backend:**

MySQL

- Algorithms:**

Classification: Linear Regression

# 1.7 Benefits for environment & Society

- This system will enhance the small businesses of small retailers with the support of the sales forecast.
- The local customer reaches increments with this system as now the retailer estimates their customer needs.
- Because of its easy-to-use nature, the starting, a small business can get a new system by which they can earn more profit!

## 1.8 Project Timeline Chart

[illegible]

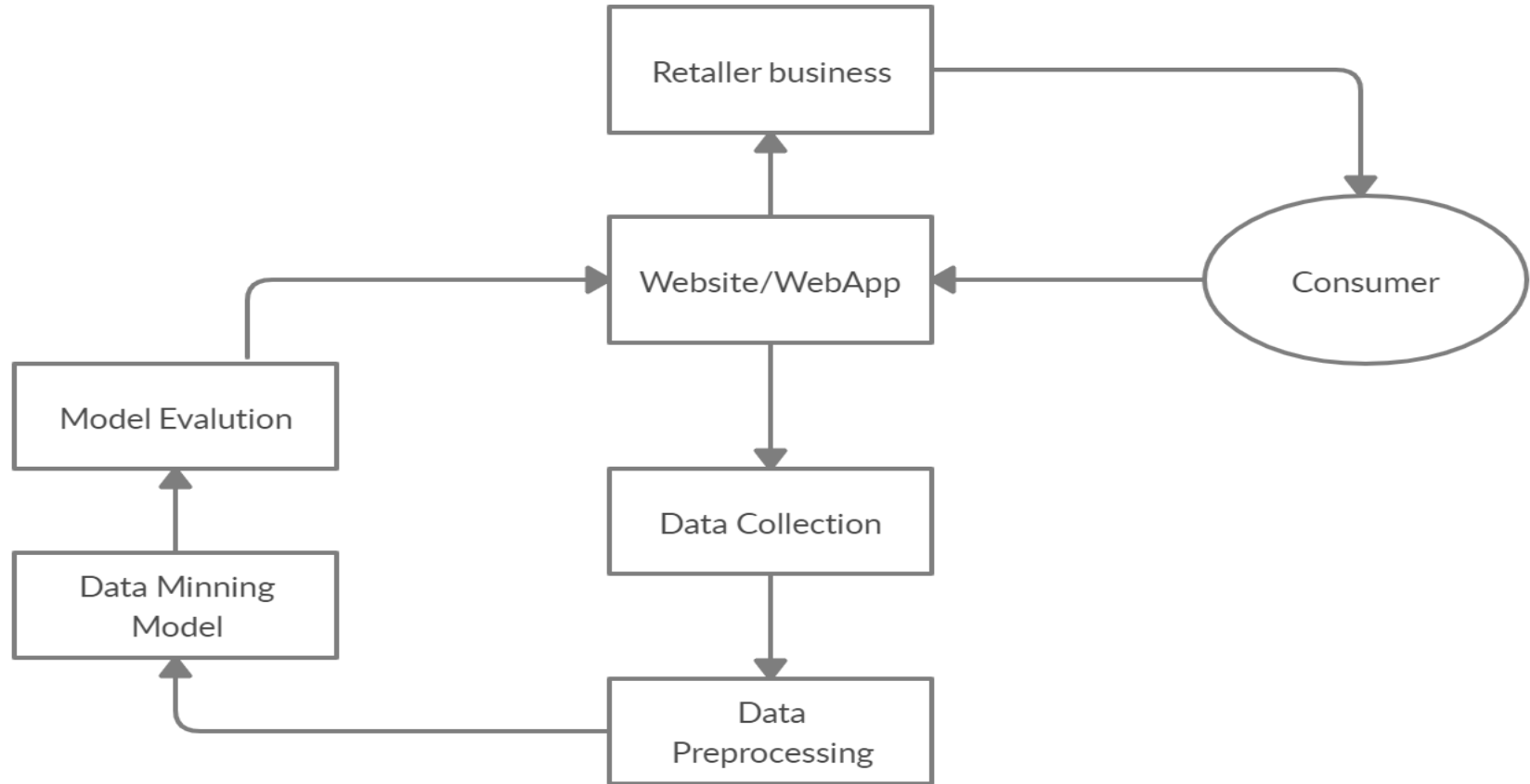
## 2. Project Design

—

## 2.1 Proposed System

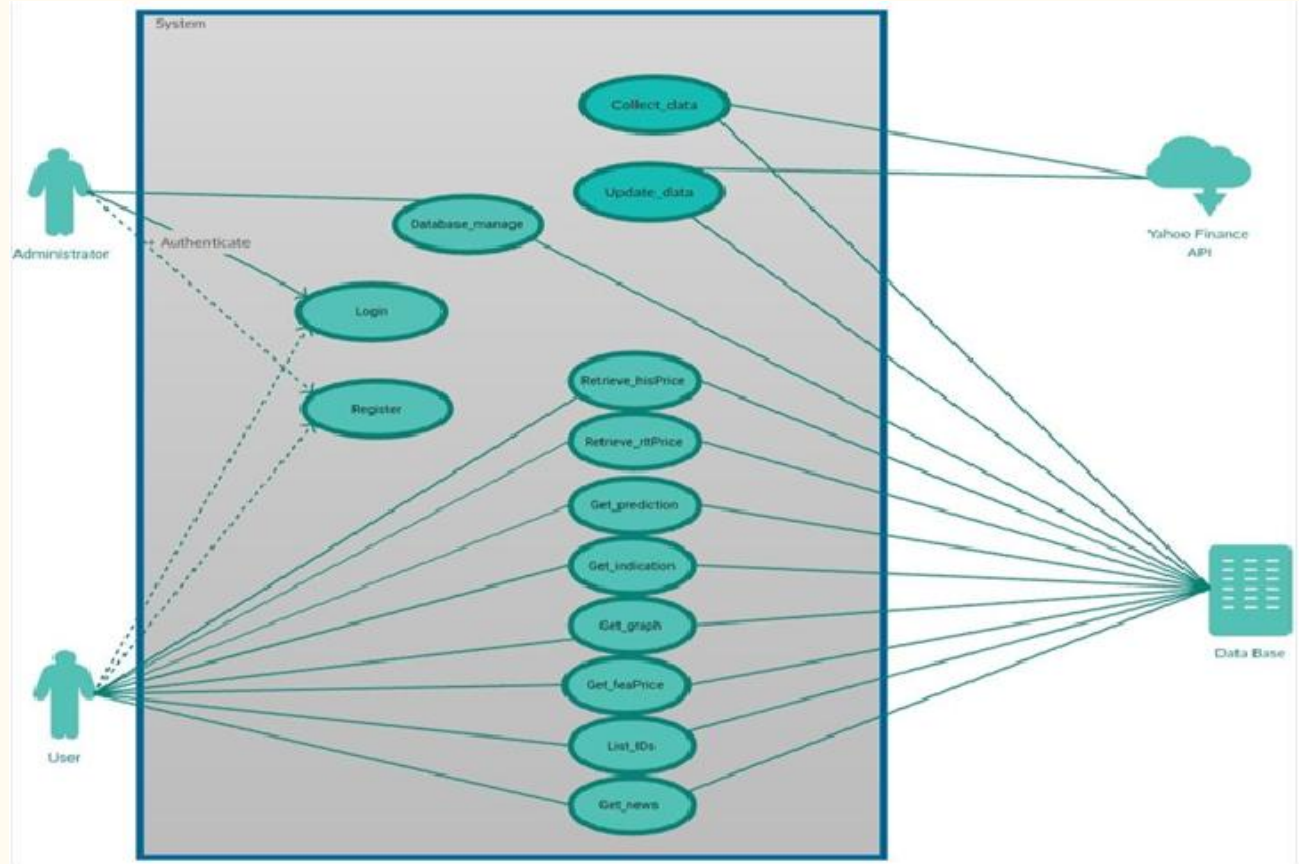
- A crucial part in this mobile app is sales prediction. This can be achieved by employing data mining algorithms on the customer data collected as well as the temporal data fed in by the shopkeepers. The best suited algorithm for the same is Regression Analysis.
- A collective analysis of the said reports will help retailers make business decisions which are convenient and cost effective.
- In this system they can add more description about product. It will product description should impress them without making them spend much time. Another important element of catalog that can help seller to increase their sales by adding there product in the right category and sub-category .

## 2.2 Design(Flow Of Modules)

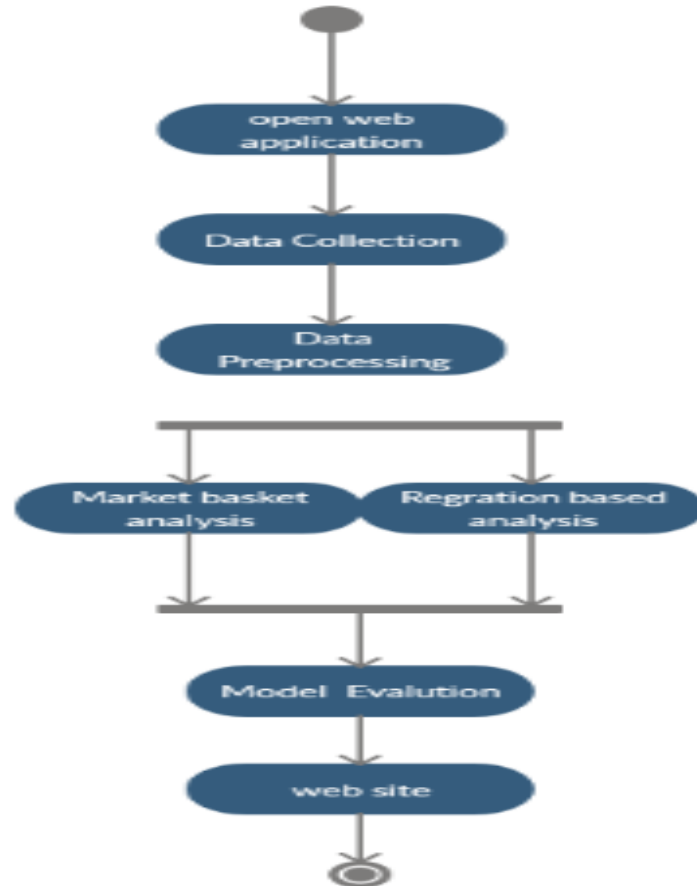




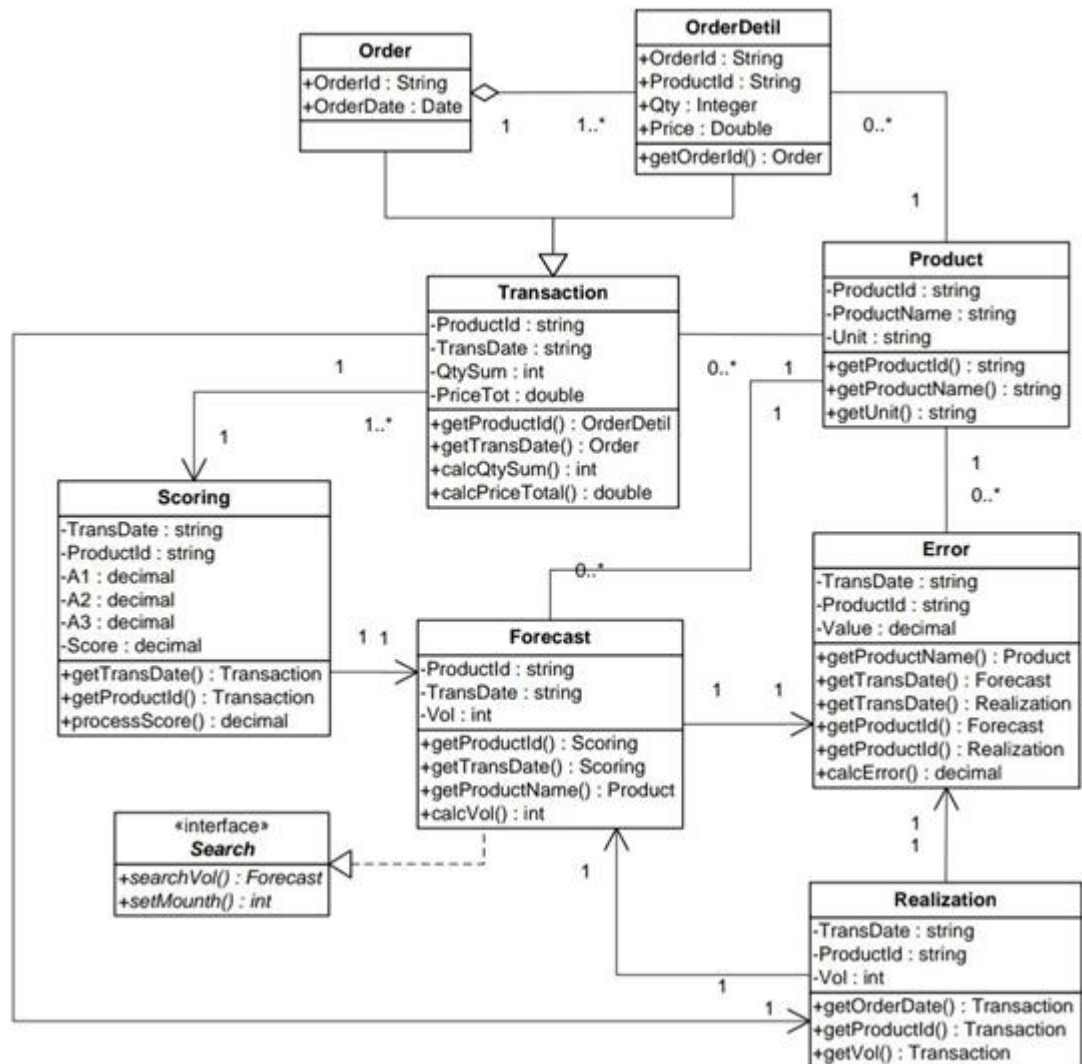
## 2.3 Description Of Use Case



## 2.4 Activity diagram



## 2.5 Class Diagram



# 2.6 Module-1

## Registration :

- Registration is one of the primary modules in any data management system.
- Registration is the process by which the retailer identically creates their account.
- Registered users normally provide some sort of credentials (such as a username or e-mail address, and a password) to the system in order to prove their identity.

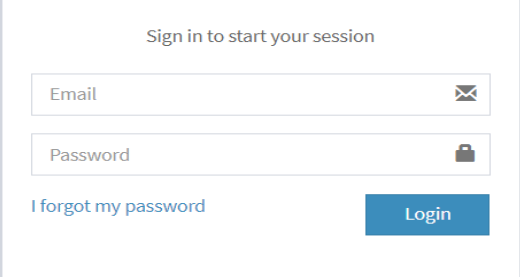
The screenshot displays the 'INVENTORYPOS' application interface. On the left is a dark sidebar with a 'WELCOME-Nisha' header, a search bar, and a list of menu items: Category, Add Product, Product List, Create Order, Bill Generation, Registration (highlighted), and Sales Report. The main content area is titled 'REGISTRATION' and contains a 'Registration Form' with input fields for Name, Email address, Password, and a Role dropdown. Below the form is a 'Save' button. To the right of the form is a table listing existing users.

#	NAME	EMAIL	PASSWORD	ROLE	DELETE
9	vishal	vishal@gmail.com	1234	User	
8	abc	abc@hotmail.com	123	User	
3	sayali	sayali@yahoo.com	1234	User	
2	Tejal	tejal@gmail.com	1234	User	
1	Nisha	nisha@gmail.com	1234	Admin	

# Module-2

## Login :


- Every store has their login credentials. This ensures segregation of data.
- If the login credentials are incorrect access is denied.
- Sessions are managed through these credentials.




The image shows a login form for a system called "INVENTORYPOS". The form is centered on a light blue background. It has a title "INVENTORYPOS" in bold, dark blue letters. Below the title, the text "Sign in to start your session" is displayed. There are two input fields: "Email" with an envelope icon and "Password" with a padlock icon. Below the "Email" field, there is a link "I forgot my password". To the right of the "Password" field, there is a blue button labeled "Login".

**INVENTORYPOS**

Sign in to start your session

Email 

Password 

[I forgot my password](#)

[Login](#)

# Module-3

## Category :

- A category is a module by which the retailer can add a different category to sort their products.
- They can add or delete the category as they want.
- This feature is helpful for them to easy search of any product detail.

The screenshot displays a web application interface for managing categories. On the left is a dark sidebar with a user profile (WELCOME-Nisha, Online) and a search bar. Below the search bar are menu items: Category, Add Product, Product List, Create Order, Bill Generation, Registration, and Sales Report. The main content area is titled 'Category' and includes a 'Category Form' with an input field for 'Enter Category' and a 'Save' button. To the right of the form is a table showing a list of categories. The table has columns for '#', 'CATEGORY', 'EDIT', and 'DELETE'. It displays five entries: 'Mobiles', 'Laptop', 'Headphones', 'iPad', and 'Soap'. Each entry has a green 'Edit' button and a red 'Delete' button. Above the table, there is a 'Show 10 entries' dropdown and a search bar.

WELCOME-Nisha  
Online

Search...

Category

Add Product

Product List

Create Order

Bill Generation

Registration

Sales Report

Category

Category Form

Category

Enter Category

Save

Show 10 entries

Search:

#	CATEGORY	EDIT	DELETE
2	Mobiles	Edit	Delete
3	Laptop	Edit	Delete
5	Headphones	Edit	Delete
6	iPad	Edit	Delete
9	Soap	Edit	Delete

# Module-4

## Add Product :

- Add product is the field by which the user can add their product detail to the system.
- The user can add the product detail such as name, category, prices price, sale price, stock, description, image.

The screenshot displays the 'Add Product' interface of the INVENTORYPOS system. On the left is a dark sidebar with the user's profile (Nisha, Online) and a menu containing options like Category, Add Product, Product List, Create Order, Bill Generation, Registration, and Sales Report. The main content area has a blue header with the title 'Add Product' and a 'Back To Product List' button. The form itself is divided into several sections: 'Product Name' with an 'Enter name' input field; 'Category' with a 'Select Category' dropdown; 'Purchase Price' and 'Sale Price' each with an 'Enter...' input field; 'Stock' with an 'Enter...' input field; 'Description' with a larger 'Enter...' text area; and 'Product Image' with a 'Choose File' button and the text 'No file chosen' and 'upload image'. A blue 'Add Product' button is located at the bottom of the form. The footer of the page includes the text 'BY : INVENTORY POS.' on the left and 'Inventory POS System V-1.0' on the right.

**INVENTORYPOS**

WELCOME-Nisha  
Online

Search...

Category

Add Product

Product List

Create Order

Bill Generation

Registration

Sales Report

**Add Product**

Back To Product List

**Product Name**  
Enter name

**Category**  
Select Category

**Purchase Price**  
Enter...

**Sale Price**  
Enter...

**Stock**  
Enter...

**Description**  
Enter...

**Product Image**  
Choose File No file chosen  
upload image

Add Product

BY : INVENTORY POS.

Inventory POS System V-1.0

# Module-5

## Product List :

- It is the main display of the product which is added by the user.
- Here user can check their products, add or delete them.
- They can edit the product if they want to.

**INVENTORYPOS** WELCOME-Nisha Online Level > Here

**Product List**

Show  entries Search:

#	Product Name	Category	Purchase Price	Sale Price	Stock	Description	Image	View	Edit	Delete
12	Maggi	Food	8	12	20	Noodles				
11	Human Body Book	Books	100	150	50	abc				
10	Lakme 9 to 5	Cosmetics	100	150	100	cosmetics				
9	Whirlpool AC	Air Conditioners	20000	25000	50	test5				
8	Dell Computer	Computer	25000	30000	20	computer				
7	sandisk memory card	Memory Card	150	200	100	memory card				
6	iphone	Mobiles	40000	45000	50	test				
5	sandisk pendrive	Pen Drives	250	350	30	files				
4	MI Power Bank	Power Banks	700	1000	40	Charging				



# Module-6

## Create Order :

- This tab takes input for incoming purchases.
- The owners can keep a record of their inventory items through this tab.
- It has date filters to sort inventory items.

**INVENTORYPOS** WELCOME-Nisha Online Nisha

### Create Order

Level > Here

#### New Order

**Customer Name**  **Date:**

#	Search Product	Stock	Price	Enter Quantity	Total
	Select Option				

**Subtotal** ₹  **Total** ₹

**Tax (5%)** ₹  **Paid** ₹

**Discount** ₹  **Due** ₹

**Payment Method**  
☒ CASH ☐ CARD ☐ CHEQUE

**Save Order**

# Module-7

## Bill Generation :

- The shopkeepers can generate bills by adding product name and quantity.
- The generated bill can be printed if required.
- The purchase details of customers can be viewed through this tab.

Sales Magicians Inc		INVOICE	
Address : Kasarvadavali , Thane		Invoice : #12345	
Phone No : 347-4567-2314		Date : 10-02-2020	
Email Address : xman02@gmail.com			
Website : www.Sales Magicians.com			
<hr/>			
<b>Bill To : Sayali Wagal</b>			
PRODUCT	QTY	PRICE	TOTAL
Iphone	1	800	800
Redmi Note	1	600	600
hard Disk	2	800	800
Pen Drive	2	1000	1000
SUBTOTAL			600
Tax			60
Discount			30
GrandTotal			6600
Paid			7000
Due			400
Payment Type			Cash
<hr/>			
<b>Important Notice :</b> No item will be replaced or refunded if you dont have the invoice with you. "You can refund within 2 days of purchase.			

# Module-8

## Sales Report :

- In this tab, there are two different views of the monthly sales of the shopkeeper's sales.
- First, It will show the table report of his sales in the targeted month.
- Second is by a graphical view of their sales data.
- Sales prediction is viewed through the line graph.
- Product analysis is given through PHPCharts.

Online

Search...

Category

Add Product

Product List

Create Order

Bill Generation

Registration

Sales Report

### Sales Report ->Table Report

blank

Filter By Date

TOTAL INVOICE  
32

SUB TOTAL  
72569

NET TOTAL  
69569

Invoice ID	Customer Name	Subtotal	Tax	Discount	Total	Paid	Due	Payment Type	Order Date
3101	Viraj Gore	2650	132.5	0	2782.5	3000	217.5	Cash	20-08-2019
3102	Kataki Kolhe	750	47.5	0	787.5	800	12.5	Card	02-05-2019
3103	Sudhir More	11550	577.5	200	11927.5	12000	12.5	Card	08-06-2019
3104	Jayesh Sonar	7500	375	0	7875	8000	125	Cash	05-11-2019
3105	Kajal Patil	700	35	0	735	735	0	Check	21-10-2019
3106	Shivam Wagamare	1900	25	0	1995	2000	5	Cash	15-10-2019

BY : INVENTORY POS.

Inventory POS System V-1.0

## 2.7 Future Scopes

- We can extend this project into an Android or ios application.
- Also, we can extend this project as a cloud service.

## 2.8 Conclusion

- This platform is a cost-effective method to assist the local shopkeepers. With sales analysis readily accessible, local businesses can explore different strategies.
- A well managed and easily retrievable purchase record will help them analyze customer purchasing patterns.

## 2.9 References

- C. Ezhilarasan and S. Ramani, "Performance prediction using modified clustering techniques with fuzzy association rule mining approach for retail," 2017 International Conference on Intelligent Computing and Control (I2C2), Coimbatore, 2017
- Xiaojun Zhang, Jisheng Pei and Xiaojun Ye, "Demographic transformation and clustering of transactional data for sales prediction of convenience stores," 2016 IEEE International Conference on Cloud Computing and Big Data Analysis (ICCCBDA), Chengdu, 2016
- Xiaojun Zhang, Jisheng Pei and Xiaojun Ye, "Demographic transformation and clustering of transactional data for sales prediction of convenience stores," 2016 IEEE International Conference on Cloud Computing and Big Data Analysis (ICCCBDA), Chengdu, 2016
- A. Setiawan, G. S. Budhi, D. H. Setiabudi and R. Djunaidy, "Data Mining Applications for Sales Information System Using Market Basket Analysis on Stationery Company," 2017 International Conference on Soft Computing, Intelligent System and Information Technology (ICSIIT), Denpasar, 2017

## 2.10 Publication

- Tejal Tandel, Sayali Wagal, Nisha Singh, Prof. Rujata Chaudhari, Prof. Vishal Badgujar, “Case Study on an Android App for Inventory Management System with Sales Prediction for Local Shopkeepers in India,” 2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS 2020).

**Thank You**

—