

A PROJECT REPORT
ON
“SMART SUPPLY CHAIN AND WAREHOUSE
MANAGEMENT SYSTEM”

Submitted to
UNIVERSITY OF MUMBAI

In Partial Fulfilment of the Requirement for the Award of

BACHELOR’S DEGREE IN
COMPUTER ENGINEERING

BY

MOMIN SANAF IRFAN ALMAS	17CO08
ANSARI HEENA ABDUL REHMAN PARVEEN	17CO01
SHAIKH IQRAA JAMIL AHMED RESHMA	17CO11

UNDER THE GUIDANCE OF
PROF. TABREZ KHAN



DEPARTMENT OF COMPUTER ENGINEERING
Anjuman-I-Islam's Kalsekar Technical Campus
SCHOOL OF ENGINEERING & TECHNOLOGY

Plot No. 2 3, Sector - 16, Near Thana Naka,
Khandagaon, New Panvel - 410206

2020-2021

AFFILIATED TO
UNIVERSITY OF MUMBAI

**A PROJECT II REPORT
ON**

**“SMART SUPPLY CHAIN AND WAREHOUSE MANAGEMENT
SYSTEM”**

**Submitted to
UNIVERSITY OF MUMBAI**

In Partial Fulfilment of the Requirement for the Award of

**BACHELOR’S DEGREE IN
COMPUTER ENGINEERING**

BY

MOMIN SANAF IRFAN ALMAS	17CO08
ANSARI HEENA ABDUL REHMAN PARVEEN	17CO01
SHAIKH IQRAA JAMIL AHMED RESHMA	17CO11

**UNDER THE GUIDANCE OF
PROF. TABREZ KHAN**



**DEPARTMENT OF COMPUTER ENGINEERING
Anjuman-I-Islam's Kalsekar Technical Campus
SCHOOL OF ENGINEERING & TECHNOLOGY
Plot No. 2 3, Sector - 16, Near Thana Naka,
Khandagaon, New Panvel - 410206**

**2020-2021
AFFILIATED TO**



UNIVERSITY OF MUMBAI

Anjuman-i-Islam's Kalsekar Technical Campus

Department of Computer Engineering

SCHOOL OF ENGINEERING & TECHNOLOGY

Plot No. 2 3, Sector - 16, Near Thana Naka,

Khandagaon, New Panvel - 410206



CERTIFICATE

This is certify that the project entitled

**“SMART SUPPLY CHAIN AND WAREHOUSE
MANAGEMENT SYSTEM“**

submitted by

MOMIN SANAF IRFAN ALMAS	17CO08
ANSARI HEENA ABDUL REHMAN PARVEEN	17CO01
SHAIKH IQRAA JAMIL AHMED RESHMA	17CO11

is a record of bonafide work carried out by them, in the partial fulfilment of the requirement for the award of Degree of Bachelor of Engineering (Computer Engineering) at *Anjuman-I-Islam's Kalsekar Technical Campus, Navi Mumbai* under the University of MUMBAI. This work is done during year 2020-2021, under our guidance.

Date: / /

Prof. TABREZ KHAN
Project Supervisor

Prof. KALPANA R. BODKE
Project Coordinator

Prof. TABREZ KHAN
HOD, Computer Department

DR. ABDUL R. HONNUTAGI
Director

External Examiner

Acknowledgements

I would like to take the opportunity to express my sincere thanks to my guide **Prof. Tarez Khan**, Assistant Professor, Department of Computer Engineering, AIKTC, School of Engineering, Panvel for his invaluable support and guidance throughout my project research work. Without his kind guidance & support this was not possible.

I am grateful to him/her for his timely feedback which helped me track and schedule the process effectively. His/her time, ideas and encouragement that he gave is help me to complete my project efficiently.

We would like to express deepest appreciation towards **DR. ABDUL RAZAK HONNUTAGI**, Director, AIKTC, Navi Mumbai, **Prof. TABREZ KHAN**, Head of Department of Computer Engineering and **Prof. KALPANA R. BODKE**, Project Coordinator whose invaluable guidance supported us in completing this project.

At last we must express our sincere heartfelt gratitude to all the staff members of Computer Engineering Department who helped me directly or indirectly during this course of work.

(17CO08) SANAF MOMIN
(17CO01) HEENA ANSARI
(17CO11) IQRAA SHAIKH

Project I Approval for Bachelor of Engineering

This project entitled *Smart Supply Chain and Warehouse Management System* by *Sanaf Momin(17CO08)*, *Heena Anasri(17CO01)*, *Iqraa Shaikh(17CO11)* is approved for the degree of *Bachelor of Engineering in Department of Computer Engineering*.

Examiners

1.

2.

Supervisors

1.

2.

Chairman

.....

Declaration

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

SANAF MOMIN (17CO08)

HEENA ANSARI (17CO01)

IQRAA SHAIKH (17CO11)

ABSTRACT

As supply chain Management involves procuring the right inputs components and capital equipment; converting them efficiently into finished products and dispatching them to the final destinations; there is a need to study as to how the company's suppliers obtain their inputs. To ensure that the supply chain is operating as efficiently as possible and generating the highest level of customer satisfaction at lowest cost, companies have to adopt supply chain management processes and associated technology.

The main idea is to develop an online application for a company which will produce products and sell them in the market. Many organizations work on the make to stock process, management will decide the quantity of the product based on the previous expectations and it is unformulated to different departments of the organization and prepare stock. In this process there are many problems for the business development. There are chances of losing the competition in the market so we provide an online application through which customers can send their order to the company through an online process and the company will develop the product. This system works on make to order basis.

Supply Chain Management aims at improving competitiveness of the supply chain as a whole, by integrating organizational units along the supply chain and by coordinating material, information and financial flows in order to fulfill (ultimate) customer demands.

The Warehouse Management System is a real-time warehouse database capable of handling large inventories of an organization. This can be used to track the inventory of a single store, or to manage the distribution of stock between several stores of a larger franchise. However, the system merely records sales and restocking data and provides notification of low stock at any location at a specified interval.

The goal is to reduce the strain of tracking rather than to handle all store maintenance. The main goal of Warehouse Management System is to ensure consistent availability of supplies for consumers.

The system is also capable of tracking In Out transactions of single or multiple stores as well as also generates their billing details. The system generates monthly reports of sales from which a manager of a respective store would be able to know the monthly sales transaction done.

Contents

Acknowledgement	iii
Project I Approval for Bachelor of Engineering	iv
Declaration	v
Abstract	vi
Table of Contents	ix
1 Introduction	2
1.1 Purpose	2
1.2 Project Scope	3
1.3 Project Goals and Objectives	3
1.3.1 Goals	3
1.3.2 Objectives	3
2 Literature Survey	4
2.1 Effects of Warehouse Management and engineering system on cost reduction and operations improvement.	4
2.1.1 Advantages of Paper	4
2.1.2 Disadvantages of Paper	4
2.1.3 How to overcome the problems mentioned in Paper	4
2.2 Research on and Implementation of the Logistics Warehouse Management System.	5
2.2.1 Advantages of Paper	5
2.2.2 Disadvantages of Paper	5
2.2.3 How to overcome the problems mentioned in Paper	5
2.3 Supply Chain Management: The Influence of SCM on Production Performance and Product Quality.	6
2.3.1 Advantages of Paper	6
2.3.2 Disadvantages of Paper	6
2.3.3 How to overcome the problems mentioned in Paper	6
2.4 Technical Review	6
2.4.1 Advantages of Technology	6
2.4.2 Reasons to use this Technology	7

3	Project Planning	8
3.1	Members and Capabilities	8
3.2	Roles and Responsibilities	8
3.3	Project Management Approach	9
3.4	Project Timeline	9
4	Software Requirements Specification	10
4.1	Overall Description	10
4.1.1	Product Perspective	10
4.1.2	Product Features	10
4.1.3	User Classes and Characteristics	10
4.1.4	Operating Environment	11
4.1.5	Design and Implementation Constraints	12
4.2	System Features	12
4.3	External Interface Requirements	13
4.3.1	User Interfaces	13
4.3.2	Hardware Interfaces	13
4.3.3	Software Interfaces	13
4.3.4	Communications Interfaces	14
5	System Design	15
5.1	System Requirements Definition	15
5.2	System Architecture Design	16
5.3	Sub-system Development	17
5.3.1	Admin Interface	17
5.3.2	Employee Interface	17
5.3.3	Customer Interface	18
5.3.4	Supplier Interface	18
5.3.5	Warehouse Interface	19
5.4	Systems Integration	19
5.4.1	Class Diagram	19
6	Implementation	20
6.1	Customer Module	20
6.2	Employee Module	22
6.3	Supplier Module	24
6.4	Warehouse Module	26
6.5	Prediction Module	28
7	System Testing	31
7.1	Test Cases and Test Results	31
7.2	Sample of a Test Case	31

8	Screenshots of Project	33
8.1	Customer Module	33
8.2	Employee Module	39
8.3	Supplier Module	46
8.4	Warehouse Module	48
9	Conclusion and Future Scope	52
9.1	Conclusion	52
9.2	Future Scope	53
	References	54



List of Figures

5.1	Use-case Diagram	16
5.2	System Architecture	17
5.3	Class Diagram	19
6.1	Customer Module	20
6.2	Employee Module	22
6.3	Supplier Module	24
6.4	Inventory System	26
6.5	Sales Prediction	28
8.1	Homepage	33
8.2	Sign-Up Page	34
8.3	Login Page	34
8.4	Contact Us Page	35
8.5	Order Page	35
8.6	E-Cart	36
8.7	Checkout Page	36
8.8	Return request page.	37
8.9	View return requests.	37
8.10	Replace request page.	38
8.11	View replace request.	38
8.12	Employee Login Page	39
8.13	Add product page	40
8.14	Order review page.	40
8.15	Prediction Analysis.	41
8.16	Quality Testing.	41
8.17	View quotation.	42
8.18	Update quotation.	42
8.19	Update replace status.	43
8.20	Update return status.	43
8.21	View return requests.	44
8.22	View replace request.	44
8.23	View product reviews.	45
8.24	Supplier Login Page	46

8.25	View quotation.	47
8.26	Upload quotation.	47
8.27	Warehouse Employee Login Page.	48
8.28	Add stock.	49
8.29	Dashboard	49
8.30	Add inventory.	50
8.31	Add driver.	50
8.32	Add vehicle.	51
8.33	Update vehicle status.	51
9.1	Future Scope.	53



List of Tables

3.1	Table of Capabilities	8
3.2	Table of Responsibilities	8



Chapter 1

Introduction

Supply Chain Management can be defined as the management of flow of products and services, which begins from the origin of products and ends at the product's consumption. It also comprises movement and storage of raw materials that are involved in work in progress, inventory and fully furnished goods. The main objective of supply chain management is to monitor and relate production, distribution and shipment of products and services. This can be done by companies with a very good and tight hold over internal inventories, production, distribution, internal productions and sales.

The Warehouse Management System is a real-time warehouse database capable of handling large inventories of an organization. This can be used to track the inventory of a single store, or to manage the distribution of stock between several stores of a larger franchise. However, the system merely records sales and restocking data and provides notification of low stock at any location at a specified interval.

1.1 Purpose

1. **Sales forecasting** : Sales forecasts can be used to identify benchmarks and determine incremental impacts of new initiatives, plan resources in response to expected demand, and project future budgets.
2. **Technology** : With the benefit of technology, customers are now becoming more technological oriented, focusing on online trading, online shopping, on-line payment, online information, online virtual chatting, and so on. This technological process has a greater impact on customers and today, customers are increasingly willing to get more information about their choice. Hence, for a company to be successful today, it needs to become more technologically connected to its consumers.
3. **Suppliers** : Supplier's motivation is important for quality, cost and delivery expectations of producing a product with value as they have a greater influence

on supplying item. Hence, ensure that you have a healthy relationship with your suppliers.

- 4. Customers :** Customers are the most unpredictable variables when determining demands. Frequent changes of demand, a new expectation, changing approach of an existing product, influential behavior attitude towards products are all determined to develop a customer-product innovation strategy.

1.2 Project Scope

This project aims to create a system that manages the process related to supply chain and warehouse management. Here, the concerned authorities can maintain the data about the product, quality testing result, the employees and many more. Here one can analyze the sales . The customer can give orders and track the status. In warehouse management the information about the goods imported and exported from the warehouse is maintained. It also deals with the proper place for the goods in the warehouse. It manages the resources, deliveries, orders, returns and feedback.

1.3 Project Goals and Objectives

1.3.1 Goals

The goal of smart supply chain and warehouse management systems is to provide companies and small scale businesses to deal with real-time visibility, enabling the optimization of processes and the ability to make instantaneous changes to improve operation speed. This system helps to monitor overall process and helps to maintain the flow of demand and supply.

1.3.2 Objectives

1. Cost quality improvement
2. Managed warehouse space
3. Efficiency
4. Enhanced customer service
5. Flexibility
6. More awareness

Chapter 2

Literature Survey

2.1 Effects of Warehouse Management and engineering system on cost reduction and operations improvement.

This paper focuses on approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying service level requirements. It is a part of supply chain management that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and point of consumption in order to meet customers' requirements.

2.1.1 Advantages of Paper

- a. The system helps in resolving the stocking and warehousing operations problems leading to cost reduction.
- b. Organizing the work, providing full visibility of expiry dates, ensuring accuracy of stocks, and generating reports related to products and their specifications.

2.1.2 Disadvantages of Paper

- a. The implementation of these changes required a close coordination with the sales and the IT teams as well as the recruitment of additional staff for picking goods and putting the Warehouse Management System into operation.
- b. The process is repeated, no specification, lead to low efficiency.

2.1.3 How to overcome the problems mentioned in Paper

- a. The system helps in resolving the stocking and warehousing operations problems leading to cost reduction.

- b. Organizing the work, providing full visibility of expiry dates, ensuring accuracy of stocks, and generating reports related to products and their specifications.

2.2 Research on and Implementation of the Logistics Warehouse Management System.

This paper, discusses the research on the modern logistics warehouse management system. All the activities involved in supply chain to ensure that production and other tasks planned to fulfill the demand and required supplies go hand-in-hand. To make the enterprise production and the other activities can properly and efficiently, objective demand supplies need to coordinate form a system that could overcome the traditional ones.

2.2.1 Advantages of Paper

- a. Intelligent logistics, the logistics service can be extended upward to the market research and forecasting, purchasing and order processing: extends downward to distribution, logistics consulting, logistics scheme selection and the planning, inventory control, policy recommendations, payment collection and settlement, education and training, logistics system design and planning of production and so on.
- b. When providing logistics service, logistics process tracking technology of the intelligent logistics, e-commerce in the auto order, based on web technology support will greatly increase the logistics service convenience and shortcut.

2.2.2 Disadvantages of Paper

- a. Process is not smooth, long in the warehouse operation process, less in delivery.
- b. Warehouse storage space has not been fully utilized, lead to waste of situation.

2.2.3 How to overcome the problems mentioned in Paper

- a. Intelligent logistics, the logistics service can be extended upward to the market research and forecasting, purchasing and order processing: extends downward to distribution, lo- gistics consulting, logistics scheme selection and the planning, inventory control, policy recommendations, payment collection and settlement, education and training, logistics system design and planning of production and so on.

- b. When providing logistics service, logistics process tracking technology of the intelligent logistics, e-commerce in the auto order, based on web technology support will greatly increase the logistics service convenience and shortcut.

2.3 Supply Chain Management: The Influence of SCM on Production Performance and Product Quality.

This paper highlights the importance of supply chain management in the manufacturing industry and its impact on performance and productivity. The study employs a quantitative survey method and data are collected from 250 manufacturing companies. SCM has a positive and significant effect on production performance. In addition, SCM also has a positive and significant effect on product quality.

2.3.1 Advantages of Paper

- a. To determine the impact of SCM on production performance quality.
- b. Effective inbound and outbound logistics systems, companies can secure high quality raw materials from few reliable suppliers as well as improve product quality by avoiding production wastage and error. This helps cut design and production times, improves product quality, and achieves a faster time-to-market.

2.3.2 Disadvantages of Paper

- a. Complex in implementation and less efficient since there are many dependent variables.
- b. Logistic features are not cohesively implemented.

2.3.3 How to overcome the problems mentioned in Paper

- a. To determine the impact of SCM on production performance quality.
- b. Effective inbound and outbound logistics systems, companies can secure high quality raw materials from few reliable suppliers as well as improve product quality by avoiding production wastage and error. This helps cut design and production times, improves product quality, and achieves a faster time-to-market.

2.4 Technical Review

2.4.1 Advantages of Technology

- a. Keras Library : Keras is a powerful and easy-to-use free open source Python library for developing and evaluating deep learning models. Keras provides some

deep learning models with their pre-trained weights. We can use these models directly for making predictions or feature extraction.

- b. Sklearn : The scikit-learn library is very versatile and handy and serves real-world purposes like the prediction of consumer behavior, the creation of neuroimages, etc. Scikit-learn is backed and updated by numerous authors, contributors, and a vast international online community.

2.4.2 Reasons to use this Technology

- a. Keras wraps the efficient numerical computation libraries Theano and TensorFlow and allows you to define and train neural network models in just a few lines of code.
- b. Sklearn covers most machine-learning tasks. It includes tools for many of the standard machine-learning tasks (such as clustering, classification, regression, etc.). And since scikit-learn is developed by a large community of developers and machine-learning experts, promising new techniques tend to be included in fairly short order.

Chapter 3

Project Planning

3.1 Members and Capabilities

Table 3.1: Table of Capabilities

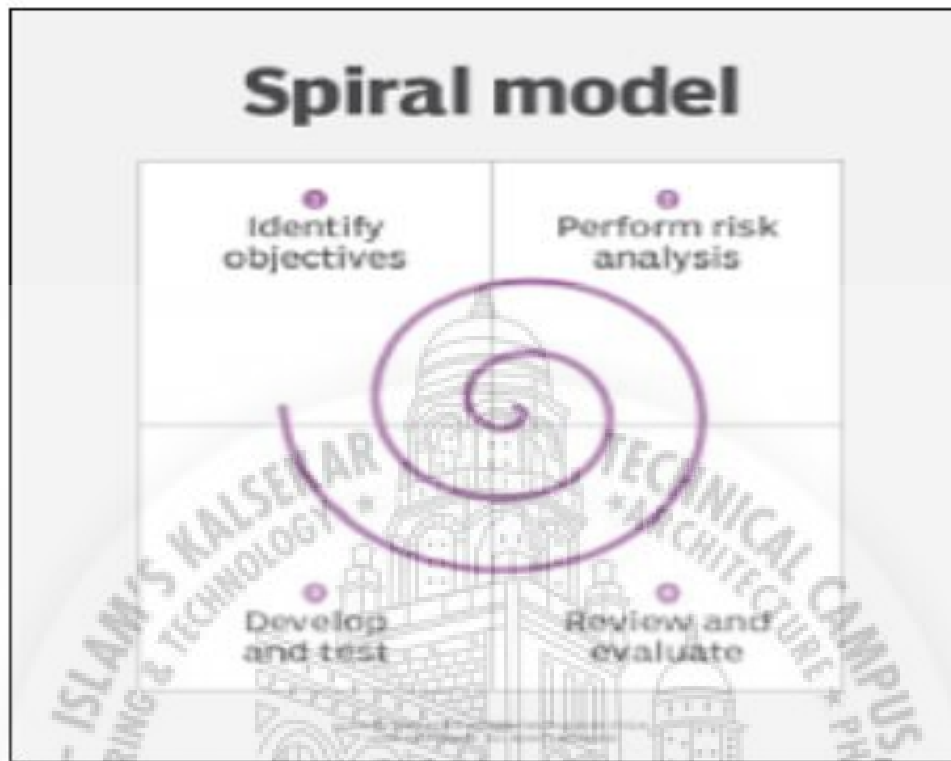
SR. No	Name of Member	Capabilities
1	SANAF MOMIN	Machine Learning
2	HEENA ANSARI	Backend
3	IQRAA SHAIKH	UI Design

3.2 Roles and Responsibilities

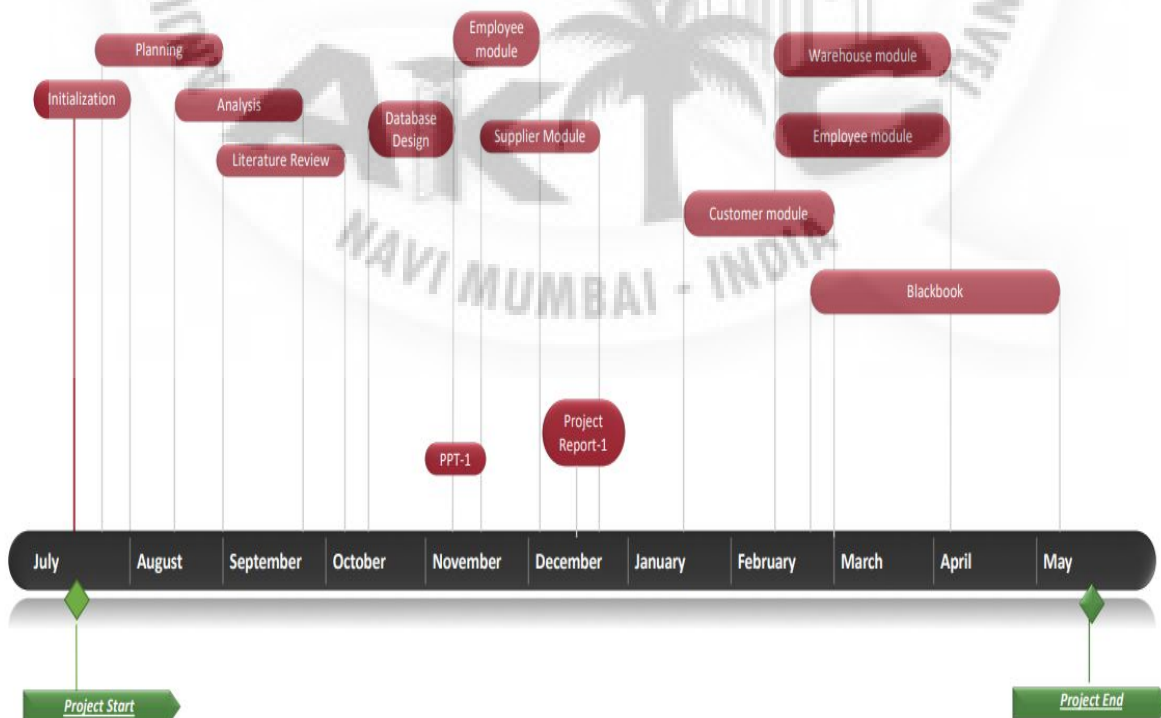
Table 3.2: Table of Responsibilities

SR. No	Name of Member	Role	Responsibilities
1	SANAF MOMIN	Team Leader	Machine Learning
2	HEENA ANSARI	Mebmer	Backend
3	IQRAA SHAIKH	Member	UI Design

3.3 Project Management Approach



3.4 Project Timeline



Chapter 4

Software Requirements Specification

4.1 Overall Description

4.1.1 Product Perspective

Supply Chain Management can be defined as the management of flow of products and services, which begins from the origin of products and ends at the product's consumption. It also comprises movement and storage of raw materials that are involved in work in progress, inventory and fully furnished goods. The main objective of supply chain management is to monitor and relate production, distribution and shipment of products and services. This can be done by companies with a very good and tight hold over internal inventories, production, distribution, internal productions and sales. [1].

4.1.2 Product Features

Supply chain and warehouse management is the most crucial part of any business to grow. As the demand is increasing drastically we need a better system that can meet those requirements. In this current situation we need an optimized system where we can have everything at one place. Any sort of waste or misinformation can lead to large loss. To keep up with the speed of the developing market, you need a software that is flexible and intelligent. Integrating a platform with cognitive computing capabilities enables a transparent, intelligent and predictive supply chain. The Warehouse Management System is a real-time warehouse database capable of handling large inventories of an organization. This can be used to track the inventory of a single store, or to manage the distribution of stock between several stores of a larger franchise. However, the system merely records sales and restocking data and provides notification of low stock at any location at a specified interval.

4.1.3 User Classes and Characteristics

The system will support 5 types of user privileges, Admin, Customer, Employee Warehouse Employee and Supplier. Customers will have access to customer func-

tions, and the employees will have access to all the functions. The warehouse employee will manage all the functions related to warehouse management. The supplier will have access to functions related to the supplier.

Admin will manage all the users of the system. Admin is responsible for the registration of employees and suppliers.

1. CUSTOMER

- Shop online.
- Add return request.
- Add replace request.
- Track order.

2. EMPLOYEE

- Manage products.
- Manage return.
- Manage replace.
- Manage orders.
- Manage quotations.
- Predict sales.
- View feedback and review.

3. WAREHOUSE

- Manage stocks.
- Manage drivers.
- Manage vehicle.
- Manage delivery.

4. SUPPLIER

- Upload quotation.
- View quotations.

4.1.4 Operating Environment

Operating environment for the user is as follows :

- Operating system : Windows / Linux
- Browser : Chrome/ Mozilla, etc (supports HTML5)

4.1.5 Design and Implementation Constraints

The information of all the products available to shop on the website should be stored in the database. User may access from any computer that has internet browsing capabilities and internet connection. Users and employees must have the correct credentials to login into the account and do actions.

4.2 System Features

1. **Customer verification via OTP :** The customer needs to register himself/herself before placing the orders. We know that security should be the top most priority, hence as soon as the customer registers, he/she is provided with an otp. This One Time Password is shared to the registered email . The customer needs to add the OTP and verify the account , only then the customer is made active. This helps in reducing the risk of spam mail being registered. It is important for the user to have access to the registered account.

2. **Manage Stock and Warehouse resources :**

In a warehouse management system the most important thing is to maintain the records of the stocks stored in the warehouse. Here , the authenticated employee has access to this functionality. Only the registered employees can alter with the information and data related to stock and resources. The employee maintains the details of the input stock. The info regarding where the stock is stored in the warehouse i.e the rack number is also being stored here. The employee manages the resources such as the vehicles and the data about the drivers. He/She updates the status about the availability of the resources.

3. **Manage E-shop and resources :**

An E-shop or electronic store is “the place” where a business can sell their products or services using digital networks. Here the employee manages all the functionalities related to E-shop. The employees can manage the products . As the customer raises a request for a return or replacement of the product, those requests should be acknowledged. The employees can deal with the return and replacement of the product . Here, they can update the status of the request as per as required. The employee also manages all the quotations.

4. **Predict the sales of product :**

With the growing demand of the products it is very important that a business is able to cope up with the demand. Inadequate production of the product can lead to loss as well as customer dissatisfaction. In order to keep up with the demand, the business needs to make proper decisions. For this we need to analyze the

sales of the product over the period of time and we use that data to predict the sales of the same product for the coming six months. This system has the ability to predict sales using historical data. To do so we use machine learning. We have used LSTM model.

4.3 External Interface Requirements

It should be simple and easy for consumers to understand and use the system. For the customer and employees including the warehouse employee, supplier, administrator, the device should prompt the login to the website.

4.3.1 User Interfaces

The system offers the web interface for the users. Allows the user to access various functionalities as per as the user group they belong to. For customers it allows access to the E-Shop interface whereas for employees, suppliers it allows access to their management interface.

4.3.2 Hardware Interfaces

Component	Minimum	Recommended
Processor	1.9 GHz x86 or x-64bit dual core processor	3.3 GHz or faster 64-bit dual core processor
Disk Storage	2GB	4GB
Display Resolution	1024x768	1024x768
CPU	Intel or AMD processor with 64 bit support	2.8 GHz or faster

4.3.3 Software Interfaces

Following are the software specifications needed for deployment of the project:

- Django==3.0.7
- django-crispy-forms==1.8.1
- django-filter==2.2.0
- django-login-required-middleware==0.4
- django-widget-tweaks==1.4.5
- pylint==2.4.4

- pytz==2019.3
- six==1.13.0
- sqlparse==0.3.0
- wrapt==1.11.2
- pycryptodome
- keras
- tensorflow
- pandas
- matplotlib
- numpy
- sklearn

Client Side - Software Requirements :

- Microsoft Windows XP or later / Ubuntu 12.0 LTS or later/ MAC OS 10.1 or later
- HTML 5 compatible Browser

4.3.4 Communications Interfaces

- Web page

Chapter 5

System Design

5.1 System Requirements Definition

Design is the first step in the development phase for any techniques and principles for the purpose of defining a device, a process or system in sufficient detail to permit its physical realization. Once the software requirements have been analyzed and specified the software design involves three technical activities design, coding, implementation and testing that are required to build and verify the software. The design activities are of main importance in this phase, because in this activity, decisions ultimately affecting the success of the software implementation and its ease of maintenance are made. These decisions have the final bearing upon reliability and maintainability of the system.

Use-case Diagram

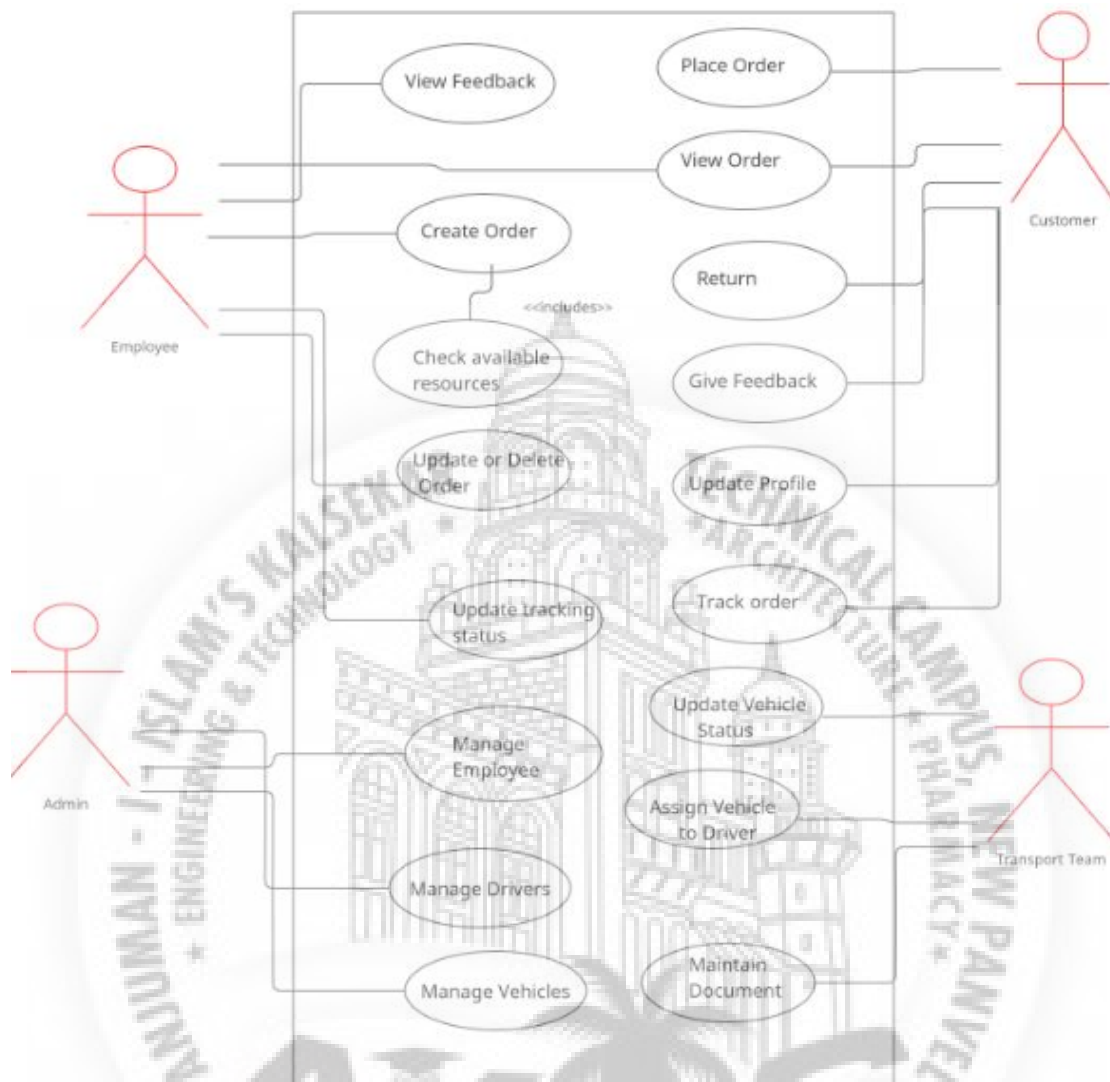


Figure 5.1: Use-case Diagram

5.2 System Architecture Design

Design is the only way to accurately translate the customer requirements into finished software or a system. Design is the place where quality is fostered in development. Software design is a process through which requirements are translated into a representation of software. Software design is conducted in two steps. Preliminary design is concerned with the transformation of requirements into data. Agile SDLC model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product. Agile Methods break the product into small incremental builds. These builds are provided in iterations.

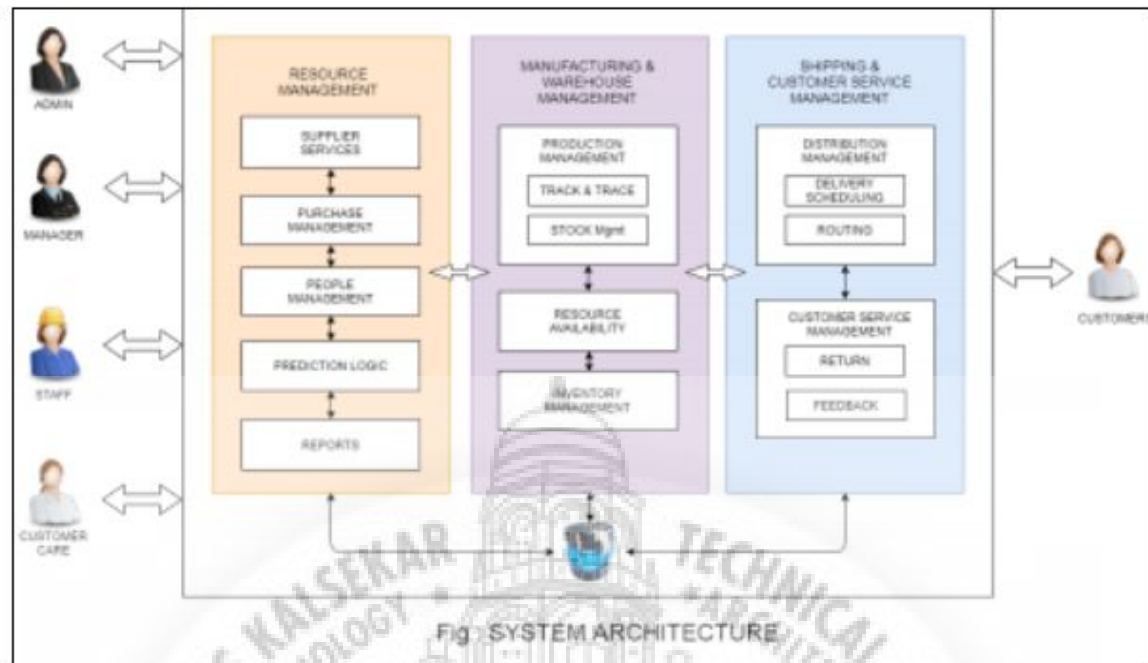


Figure 5.2: System Architecture

5.3 Sub-system Development

5.3.1 Admin Interface

The admin is responsible for the registration of all the employees and suppliers. The admin will register the employees of the warehouse and the company as well as the suppliers. The admin can change the accessibility for a given employee or a group of users. The admin can add, update or delete content as required.

5.3.2 Employee Interface

The admin registers the employee. With the given login credential the employee can login. The employee deals with the various modules. The employee will be able to add a new product to the online store. Various info related to the product should be added such as name, category, subcategory if any, the size, price, image, etc. The employee can also delete the product if required. The categories can be added or deleted as per the requirements. The quotation uploaded by the supplier can be viewed by the employee. The employee can change the status of the quotation to - 'rejected', 'approved'. The employee can also add the info for a quality test. All the orders given by the customers will be displayed in the my orders section. Here, we can update the status of the order as - 'packed', 'delivered', and so on. As we know that feedback and reviews help us to understand the customer. So the employees can view the feedback and reviews provided by the customer. It can be later reverted

back via company emails. The return and replace module will also be handled by the employees. In the return module, the employee will be able to view all the return requests and update the status as - 'approved', 'rejected'. Whereas in the replace module, the employee will be able to view all the replace all the replace requests. Accordingly the employee can update the status of replacement to - 'approved', 'packed', 'on the way', 'delivered'. The employee can also run the prediction. Here, it predicts the sales of a product for the next 6 months. For prediction we have used the LSTM model i.e long term short memory.

For prediction , we have used the LSTM model. LSTM Model : Long short-term memory (LSTM) is an artificial recurrent neural network (RNN) architecture[1] used in the field of deep learning. Unlike standard feedforward neural networks, LSTM has feedback connections. It can not only process single data points (such as images), but also entire sequences of data (such as speech or video). For example, LSTM is applicable to tasks such as unsegmented, connected handwriting recognition, speech recognition and anomaly detection in network traffic or IDSs (intrusion detection systems).LSTM networks are well-suited to classifying, processing and making predictions based on time series data, since there can be lags of unknown duration between important events in a time series. LSTMs were developed to deal with the vanishing gradient problem that can be encountered when training traditional RNNs.

5.3.3 Customer Interface

The customer can register via the registration form. The registration form includes - first name, last name, email and password. Once the customer has registered he/she can login via the login page. The customers can browse through various products and add them in the cart or just check it out. The customer can contact via the contact us form. The customers can also give their review about the products. These reviews will be viewed by the other customer as well as the employee. The customer can track his order and know the status of it. In case the customer is unsatisfied with the product, then the customer can raise a return request and give appropriate reasons for returning the product. In case , if the product is damaged or not functional the customer, but the customer wants to replace the product then that can be done via raising a replacement request.

5.3.4 Supplier Interface

The supplier will be registered by the admin. The login credential will be provided. Via the credentials the supplier can add the quotations and check the status. As soon as the employee updates the status it will be reflected to the supplier.

5.3.5 Warehouse Interface

The admin can register the employee for the warehouse. The warehouse module deals with different functionalities. As soon as the employee logs in, the dashboard is displayed. The dashboard consists of a graph that displays all the stock in the warehouse. The employee can add the info about the incoming stock in the warehouse. This can also be updated or deleted as per the requirement. All the info about the outgoing stock can also be maintained here. The changes are reflected on the dashboard. The record of which product is stored on which rack can be managed. The data related to drivers and vehicles is also maintained. The employee can add and update the drivers details. The employee can also register the vehicles and update its status as required. The details about the delivery of goods are maintained. Here, we keep a record about the vehicle and driver details.

5.4 Systems Integration

5.4.1 Class Diagram

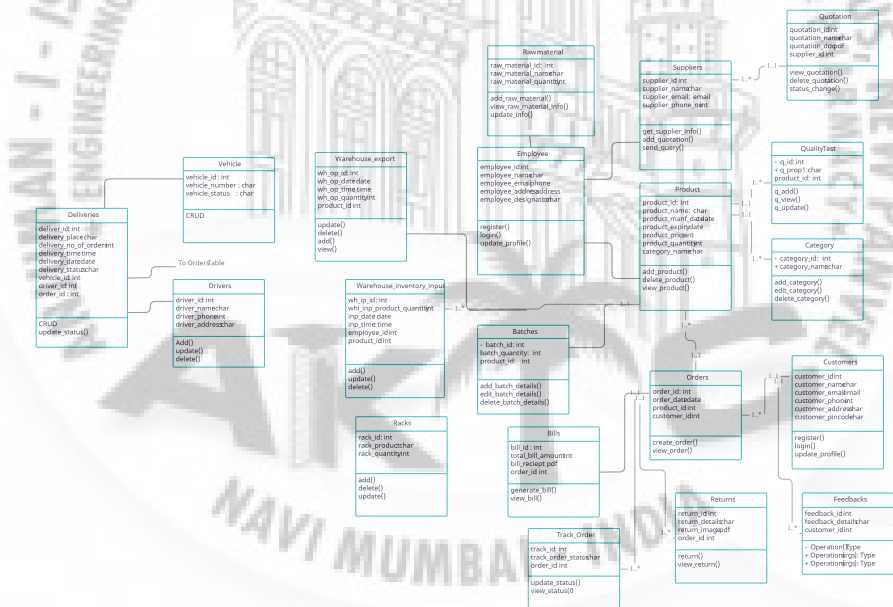


Figure 5.3: Class Diagram

Chapter 6

Implementation

6.1 Customer Module



Figure 6.1: Customer Module

```

1 <!DOCTYPE html>
2 <html>
3
4 <head>
5   <title >SCWMS</title >
6   {% load static %}
7   {% load app_tags %}
8   <meta charset="utf-8">
9   <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-
10  fit=no">
11  <meta content="width=device-width, initial-scale=1.0" name="viewport">
12  <meta content="" name="keywords">
13  <meta content="" name="description">

```



```
13 <!-- Add to cart -->
14 <script type="text/javascript">
15   if (localStorage.getItem('add_to_cart') == null) {
16     var add_to_cart = {};
17   }
18   else {
19     add_to_cart = JSON.parse(localStorage.getItem('add_to_cart'));
20   }
21 </script>
22 {% if not user.is_authenticated %}
23 <script type="text/javascript">
24   if (localStorage.getItem('add_to_cart') == null) {
25     var add_to_cart = {};
26   }
27   else {
28     add_to_cart = JSON.parse(localStorage.getItem('add_to_cart'));
29     document.getElementById('cart_no').innerHTML = Object.keys(add_to_cart).
30       length;
31   }
32   $('#add_to_cart').click(function () {
33     var idstr = $(this).attr("prod_id");
34     console.log(idstr);
35     if (add_to_cart[idstr] != undefined) {
36       add_to_cart[idstr] = add_to_cart[idstr] + 1;
37     }
38     else {
39       add_to_cart[idstr] = 1;
40     }
41     localStorage.setItem('add_to_cart', JSON.stringify(add_to_cart));
42     /* JSON.stringify - converts object to string */
43     document.getElementById('cart_no').innerHTML = Object.keys(add_to_cart).
44       length;
45     update_cart();
46   });
```

6.2 Employee Module

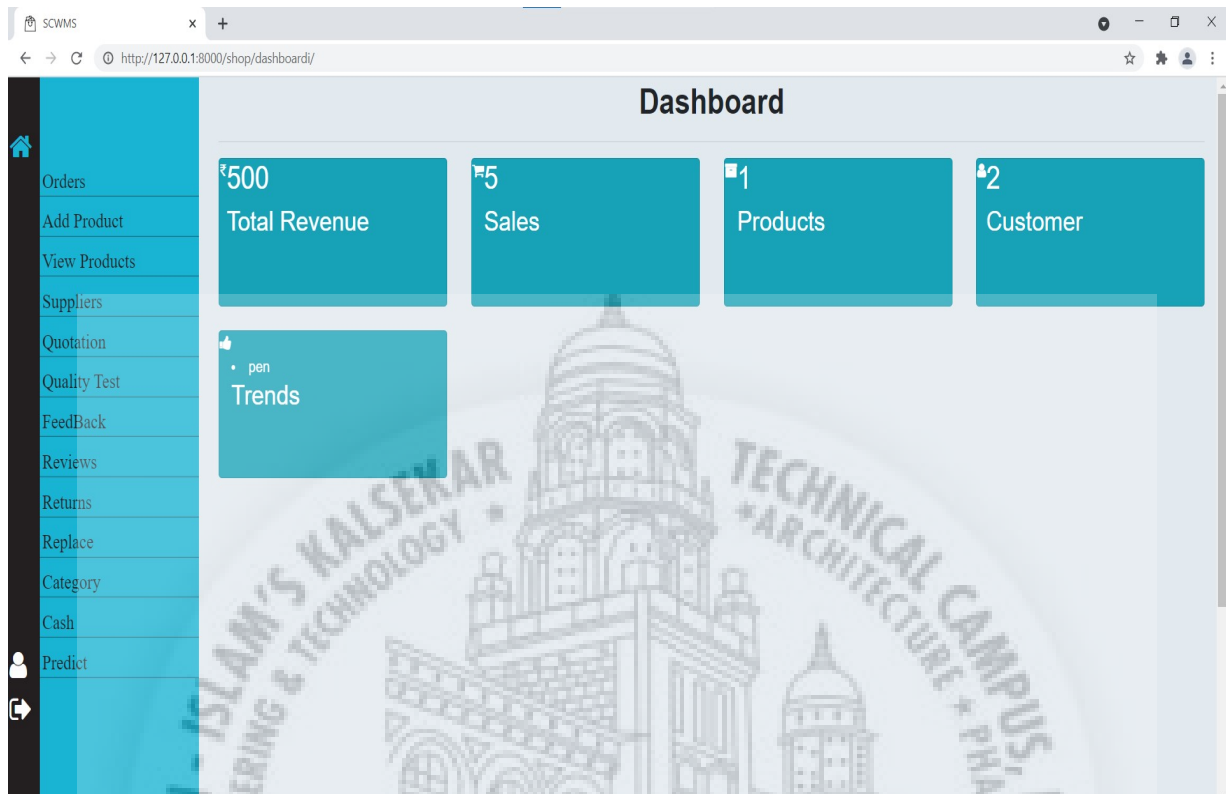


Figure 6.2: Employee Module

```

1
2 {% block saler_body %}
3 <!-- Page wrapper -->
4 <div class="page-wrapper" style=" height: 1000px">
5   <!-- Bread crumb -->
6   <div class="row page-titles">
7     <div class="col-md-5 align-self-center" >
8       </div>
9   </div>
10  <!-- Container fluid -->
11  <div class="container-fluid">
12    <h3 style="text-align: center; font-size: 35px; font-weight: bold;
13      padding: 3px;">Dashboard </h3><hr>
14
15    <!-- Start Page Content -->
16    <!--
17      m - for classes that set margin
18      p - for classes that set padding
19      text-white bg-info == used for changing card color
20    -->
21    <div class="row">
22      <div class="col-md-3 ">
23        <div class="card p-30 text-white bg-info" style="height: 150px;
24          ">
25          <div class="media">
26            <div class="media-left ">
27              <span>&#8377</span>
28            </div>

```

```

27         <div class="media-body media-text-right">
28             <h2>{{ total_sale }}</h2>
29             <h3>Total Revenue</h3>
30         </div>
31     </div>
32 </div>
33 </div>
34 <div class="col-md-3 ">
35     <div class="card p-30 text-white bg-info" style="height: 150px;"
36     >
37         <div class="media">
38             <div class="media-left meida media-middle">
39                 <span><i class="fa fa-shopping-cart "></i></span>
40             </div>
41             <div class="media-body media-text-right">
42                 <h2>{{ orders }}</h2>
43                 <!-- <p class="m-b-0">Sales </p-->
44                 <h3>Sales </h3>
45             </div>
46         </div>
47     </div>
</div>

```

6.3 Supplier Module

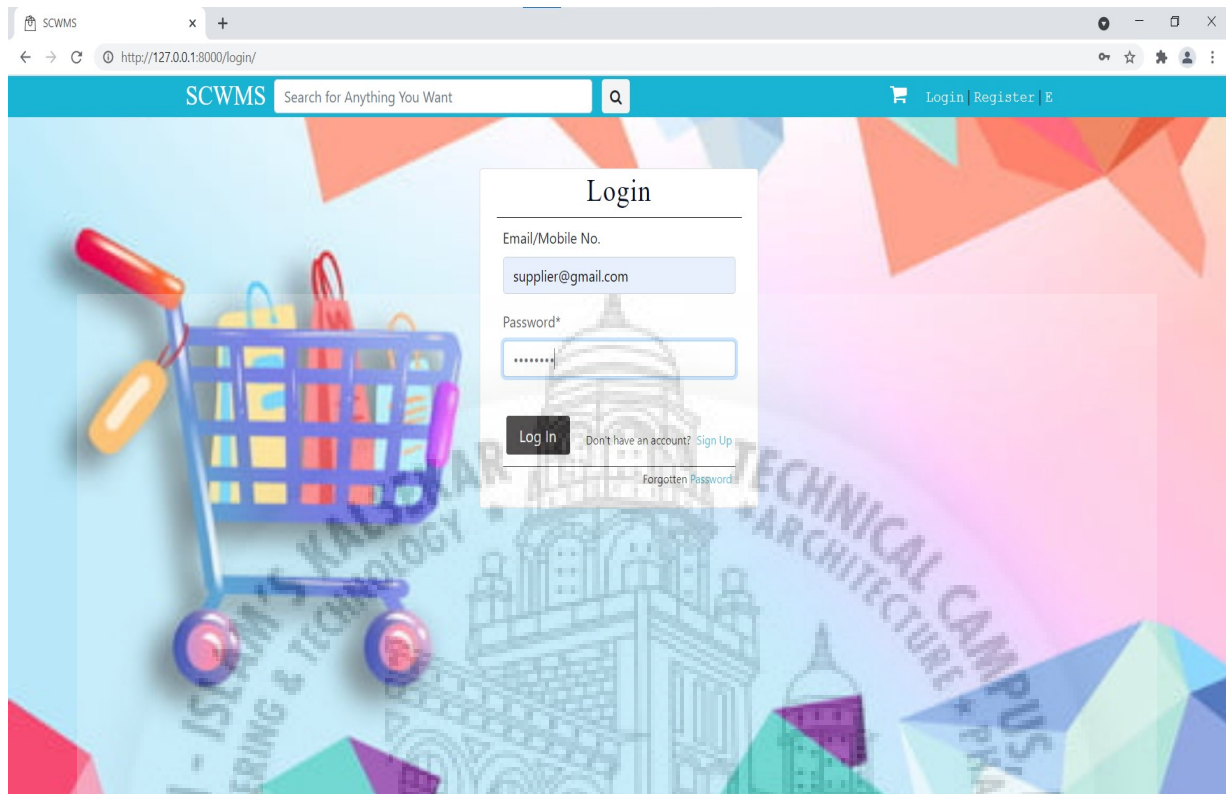


Figure 6.3: Supplier Module

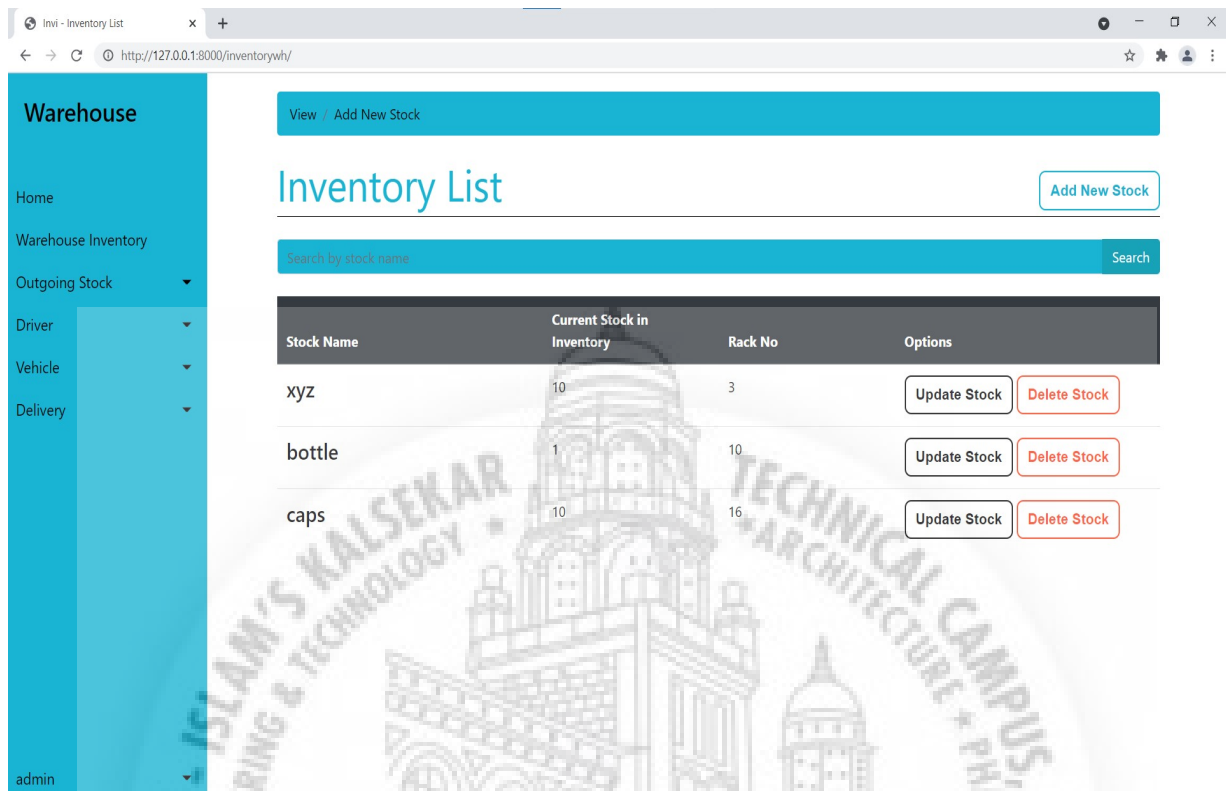
```

1  from django.shortcuts import render, redirect
2  from django.http import HttpResponse
3  from django.http import HttpResponseRedirect
4  from django.core.files.storage import FileSystemStorage
5  from django.contrib.auth import logout
6
7
8  from .forms import QuotationForm, Supplier_loginForm
9  from inventory.models import Quotation, Supplier
10
11 # Create your views here.
12 def home_supplier(request)
13     return render(request, 'home_supplier.html', {})
14
15
16 def upload_quotation(request)
17     if request.method == POST
18         form = QuotationForm(request.POST, request.FILES)
19         if form.is_valid()
20             form.save()
21             print(uploaded)
22             return redirect('show_quotations_supplier')
23     else
24         form = QuotationForm()
25         return render(request, 'upload_quotations.html', {'form': form})
26
27 def show_supp_quotation(request)
28     quotations = Quotation.objects.all()

```

```
29     return render(request, 'show_quotation_supplier.html', {'quotations':
30         quotations})
31 def supplier_login(request)
32     if request.method == POST
33         form = Supplier_loginForm(request.POST)
34         if form.is_valid():
35             supplieremail = form.cleaned_data['email']
36             supplierpassword = form.cleaned_data['password']
37
38             if Supplier.objects.filter(supplier_email=supplieremail,
39                 supplier_password=supplierpassword).exists():
40                 print(hi)
41                 print(form)
42
43                 return redirect('supplier_home', {})
44             else
45                 form = Supplier_loginForm()
46                 return render(request, 'supplier_login.html', {'form': form})
47         else
48             form = Supplier_loginForm()
49             return render(request, 'supplier_login.html', {'form': form})
50 def supplier_logout(request)
51     logout(request)
52     return redirect('login')
```

6.4 Warehouse Module



The screenshot shows a web browser window with the URL `http://127.0.0.1:8000/inventorywh/`. The page title is "Inventory List". On the left is a blue sidebar with the following menu items: Warehouse, Home, Warehouse Inventory, Outgoing Stock, Driver, Vehicle, Delivery, and admin. The main content area has a blue header with "View / Add New Stock" and "Add New Stock" button. Below the header is a search bar labeled "Search by stock name" with a "Search" button. The main content is a table with the following data:

Stock Name	Current Stock in Inventory	Rack No	Options
xyz	10	3	Update Stock Delete Stock
bottle	1	10	Update Stock Delete Stock
caps	10	16	Update Stock Delete Stock

Figure 6.4: Inventory System

```

1
2 from django.shortcuts import render, redirect, get_object_or_404
3 from django.views.generic import (
4     View,
5     CreateView,
6     UpdateView
7 )
8 from django.contrib.messages.views import SuccessMessageMixin
9 from django.contrib import messages
10 from .models import Stock, Rack, Driver, Vehicle, Delivery
11 from .forms import StockForm, RackForm, DriverForm, VehicleForm, DeliveryForm,
12     DriverUpdateForm, VehicleUpdateForm
13 from django_filters.views import FilterView
14 from .filters import StockFilter, RackFilter, DriverFilter, VehicleFilter,
15     DeliveryFilter
16
17 class StockListView(FilterView):
18     filterset_class = StockFilter
19     queryset = Stock.objects.filter(is_deleted=False)
20     template_name = 'inventory.html'
21     paginate_by = 10
22
23
24 class RackListView(FilterView):
25     filterset_class = RackFilter
26     queryset = Rack.objects.filter(is_deleted=False)
27     template_name = 'rack.html'

```

```
28     #paginate_by = 10
29
30
31
32 class VehicleListView(FilterView):
33     filterset_class = VehicleFilter
34     queryset = Vehicle.objects.filter(is_deleted=False)
35     template_name = "vehicle.html"
36
37
38
39     #stock.save()
40     messages.success(request, self.success_message)
41     return redirect('delivery')
```



6.5 Prediction Module

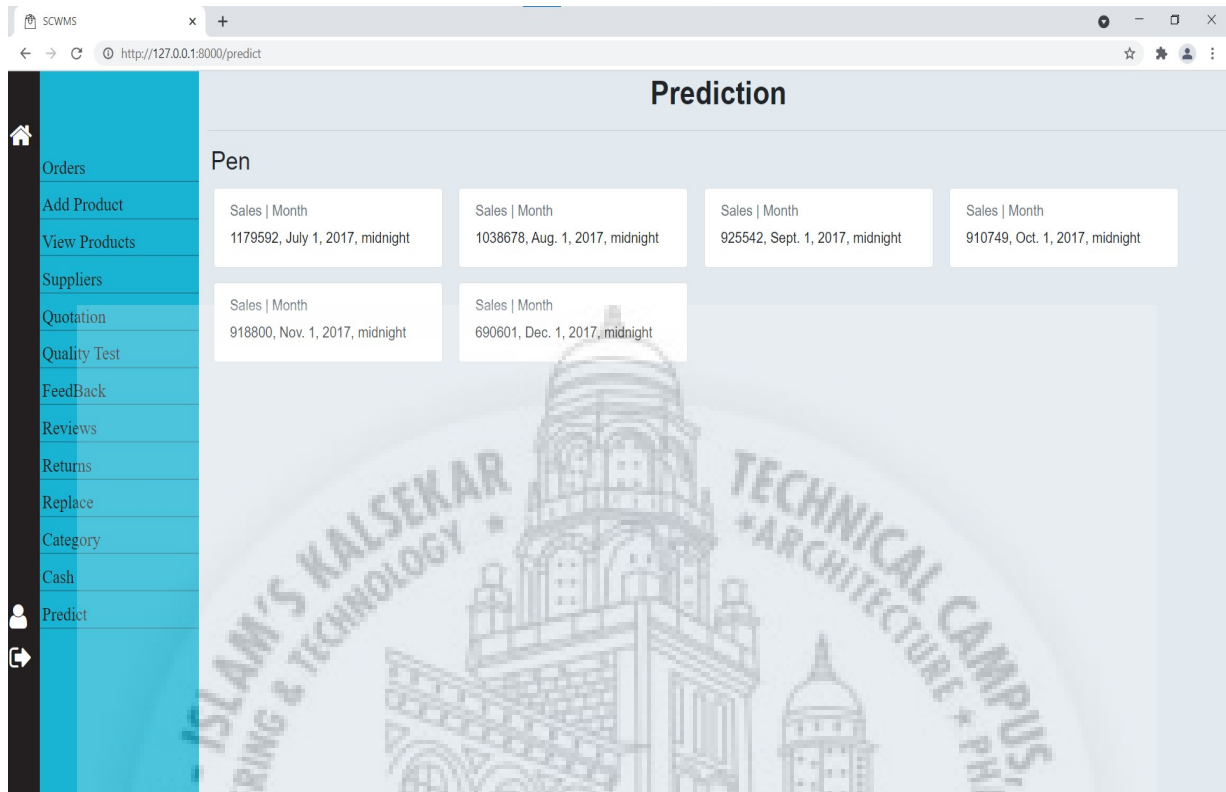


Figure 6.5: Sales Prediction

```

1  from __future__ import division
2  from django.shortcuts import render, redirect, get_object_or_404
3  from django.http import HttpResponse, JsonResponse
4  # Create your views here.
5
6  from datetime import datetime, timedelta, date
7  import pandas as pd
8
9  import matplotlib.pyplot as plt
10 import numpy as np
11
12 #%matplotlib inline #displaying graph within cell for notebooks
13 import warnings
14 warnings.filterwarnings("ignore")
15
16 import plotly.plotly as py
17 import plotly.offline as pyoff
18 import plotly.graph_objs as go
19
20
21 import chart_studio.plotly as py
22 import plotly.offline as pyoff
23 import plotly.graph_objs as go
24
25
26 #import MinMaxScaler and create a new dataframe for LSTM model
27
28 df_model = df_supervised.drop(['sales', 'date'], axis=1)
29 #split train and test set

```



```

30 train_set , test_set = df_model[0:-6].values , df_model[-6:].values
31
32
33
34 #apply Min Max Scaler
35 scaler = MinMaxScaler(feature_range=(-1, 1))
36 scaler = scaler.fit(train_set)
37 # reshape training set
38 train_set = train_set.reshape(train_set.shape[0], train_set.shape[1])
39 train_set_scaled = scaler.transform(train_set)
40 # reshape test set
41 test_set = test_set.reshape(test_set.shape[0], test_set.shape[1])
42 test_set_scaled = scaler.transform(test_set)
43
44 #__ working
45
46
47 X_train , y_train = train_set_scaled[:, 1:], train_set_scaled[:, 0:1]
48 X_train = X_train.reshape(X_train.shape[0], 1, X_train.shape[1])
49 X_test , y_test = test_set_scaled[:, 1:], test_set_scaled[:, 0:1]
50 X_test = X_test.reshape(X_test.shape[0], 1, X_test.shape[1])
51
52 #__ working
53 model = Sequential()
54 model.add(LSTM(4, batch_input_shape=(1, X_train.shape[1], X_train.shape[2]),
55     stateful=True))
56 model.add(Dense(1))
57 model.compile(loss='mean_squared_error', optimizer='adam')
58 model.fit(X_train, y_train, epochs=100, batch_size=1, verbose=1, shuffle=
59     False) #chnge nb_epochs to epochs
60 #print("HELLO")
61
62 #__ working fine
63
64 y_pred = model.predict(X_test, batch_size=1)
65 #for multistep prediction, you need to replace X_test values with the
66 #predictions coming from t-1
67 #print(y_pred)
68
69 #__ Working
70
71
72 #reshape y_pred
73 y_pred = y_pred.reshape(y_pred.shape[0], 1, y_pred.shape[1])
74 #rebuild test set for inverse transform
75 pred_test_set = []
76 for index in range(0, len(y_pred)):
77     #print(np.concatenate([y_pred[index], X_test[index]], axis=1))
78     pred_test_set.append(np.concatenate([y_pred[index], X_test[index]], axis
79     =1))
80 #reshape pred_test_set
81 pred_test_set = np.array(pred_test_set)
82 pred_test_set = pred_test_set.reshape(pred_test_set.shape[0], pred_test_set.
83     shape[2])
84 #inverse transform
85 pred_test_set_inverted = scaler.inverse_transform(pred_test_set)

```

```
86
87
88 #create dataframe that shows the predicted sales
89 result_list = []
90 sales_dates = list(df_sales[-7:].date)
91 act_sales = list(df_sales[-7:].sales)
92 for index in range(0,len(pred_test_set_inverted)):
93     result_dict = {}
94     result_dict['pred_value'] = int(pred_test_set_inverted[index][0] +
95         act_sales[index])
96     result_dict['date'] = sales_dates[index+1]
97     result_list.append(result_dict)
98 df_result = pd.DataFrame(result_list)
99
100 #for multistep prediction, replace act_sales with the predicted sales
101
102
103 #print(df_result)
104
105 ...
106
107 pred_value    date
108 0    1180597 2017-07-01
109 1    1045772 2017-08-01
110 2     929944 2017-09-01
111 3     906169 2017-10-01
112 4     918590 2017-11-01
113 5     694070 2017-12-01
114 ...
115
116 html = df_result.to_html(classes='table table-striped')
117
118 # write html to file
119 #text_file = open("predict/templates/prediction_show.html", "a")
120 #text_file.write(html)
121 #text_file.close()
122 return render(request, 'prediction_show.html',{'result_list':result_list})
```

Chapter 7

System Testing

7.1 Test Cases and Test Results

Test ID	Test Case Title	Test Condition	System Behavior	Expected Result
T01	LOG-IN	User should be registered.	User can login.	After login, home screen is displayed.
T02	SEARCH STOCK	Product should be added.	Display the record related to 'product'.	Displays the record related to 'product'.
T03	MULTIPLE LOG-IN:VARIOUS USERS	Login user according to the user group they belong to.	If customer redirect to shop page If employee or supplier redirect to the respective home pages .	Redirecting the user to their respective pages as per their user group.

7.2 Sample of a Test Case

Title: Login Page – Authenticate Successfully.

Description: A registered user should be able to login successfully.

Precondition: the user must already be registered with a valid email address and password.

Assumption: a supported browser is being used.

Test Steps:

1. Navigate to login page.
2. In the 'email' field, enter the email of the registered user.
3. Enter the password of the registered user

4. Click 'Log In'

Expected Result: The user is directed to homepage as per the user group it belongs to.



Chapter 8

Screenshots of Project

8.1 Customer Module



Figure 8.1: Homepage

SCWMS Search for Anything You Want Login Register E

Sign Up

First name* Last name*

Mobile Number/Email*

Password* Confirm*

Sign Up Already Registered? Log In

Figure 8.2: Sign-Up Page

SCWMS Search for Anything You Want Login Register E

Login

Email/Mobile No.

Password*

Log In Don't have an account? Sign Up

Forgotten Password

Figure 8.3: Login Page

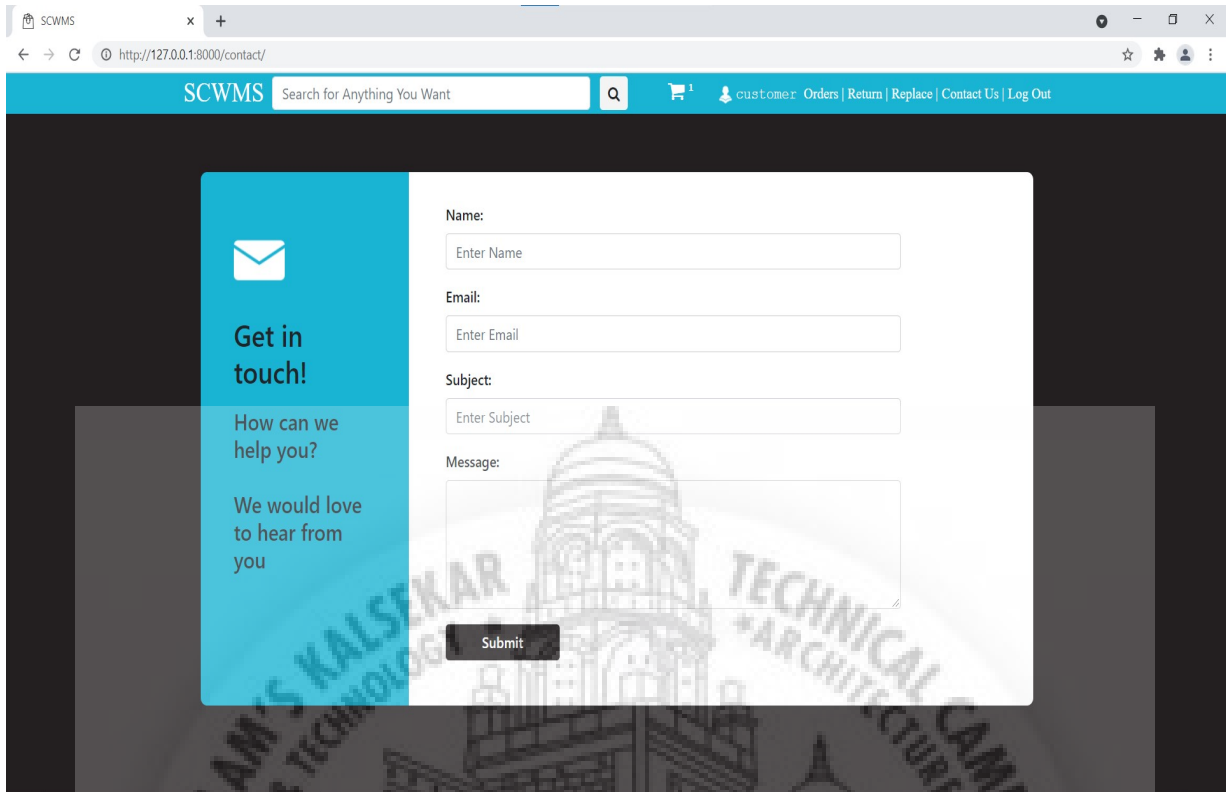


Figure 8.4: Contact Us Page



Figure 8.5: Order Page

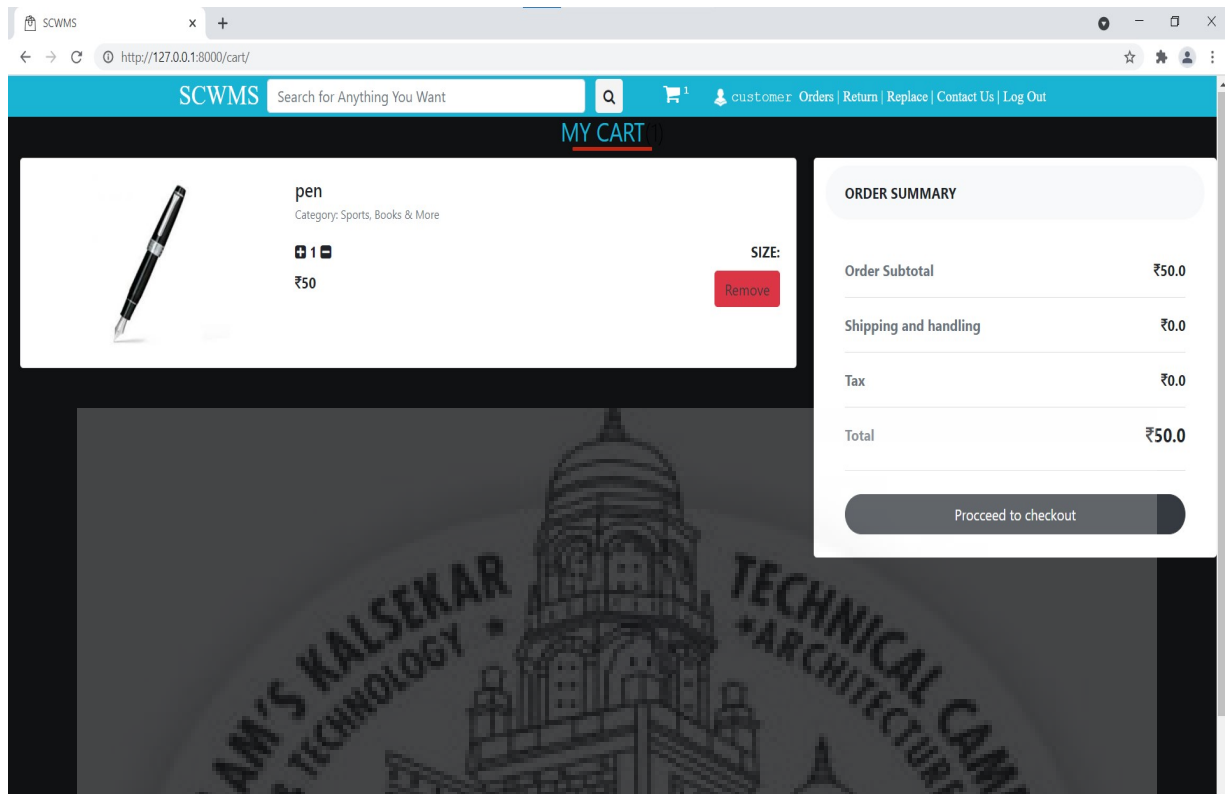


Figure 8.6: E-Cart

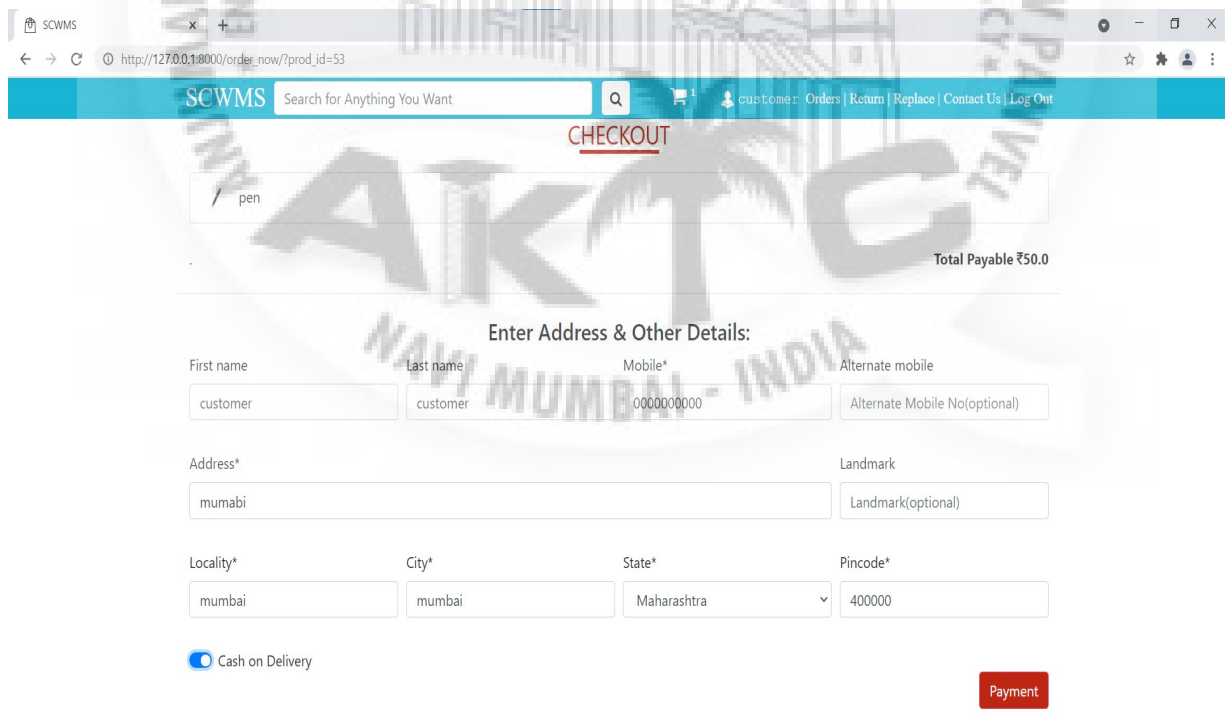


Figure 8.7: Checkout Page

SCWMS Search for Anything You Want customer: Orders | Return | Replace | Contact Us | Log Out

My Returns

Add / Show

Order no*

Reason*

Description*

Submit

Figure 8.8: Return request page.

SCWMS Search for Anything You Want customer: Orders | Return | Replace | Contact Us | Log Out

My Returns

Add / Show

Order no	Status
ordr001	Approved
ordr11	Approved

Figure 8.9: View return requests.

SCWMS Search for Anything You Want

Replace My Order

Add / Show

Order no*

Reason*

Description*

Submit

Figure 8.10: Replace request page.

SCWMS Search for Anything You Want

Replace

Add / Show

Order no	Status
ordr11	Delivered

Figure 8.11: View replace request.

8.2 Employee Module

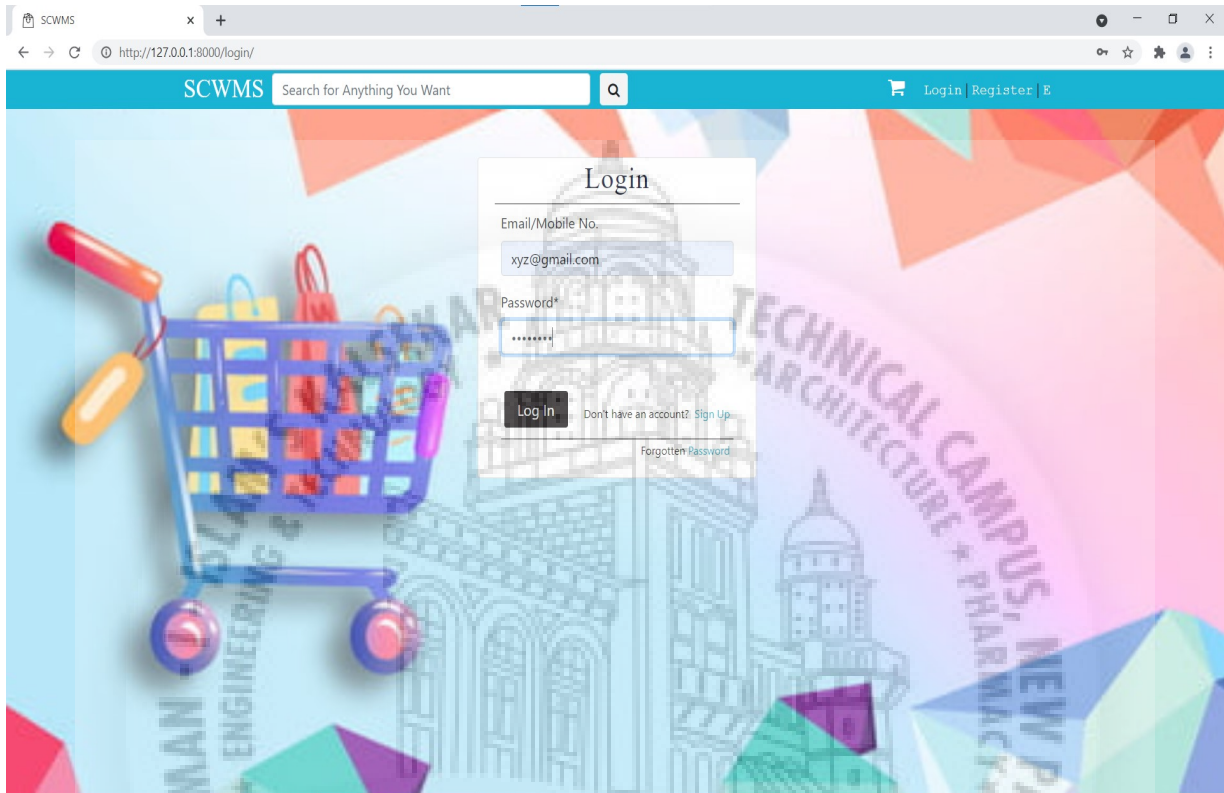


Figure 8.12: Employee Login Page

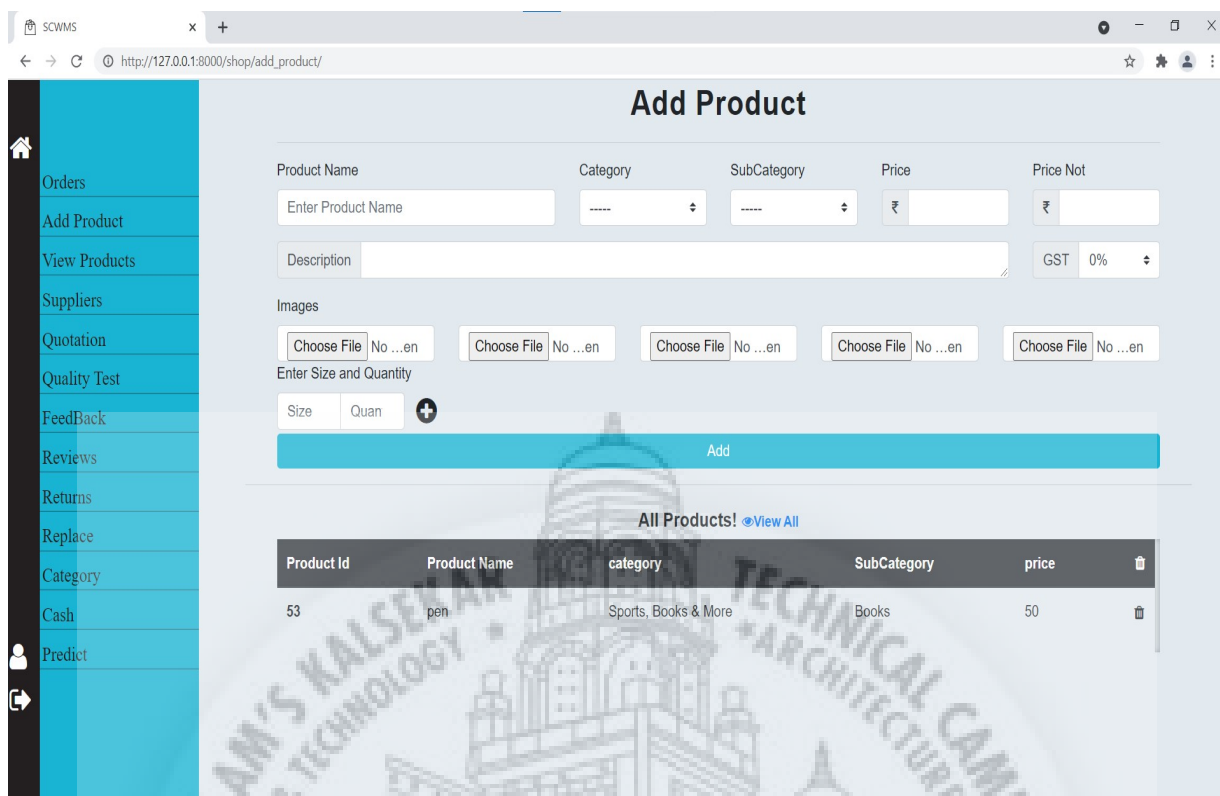


Figure 8.13: Add product page

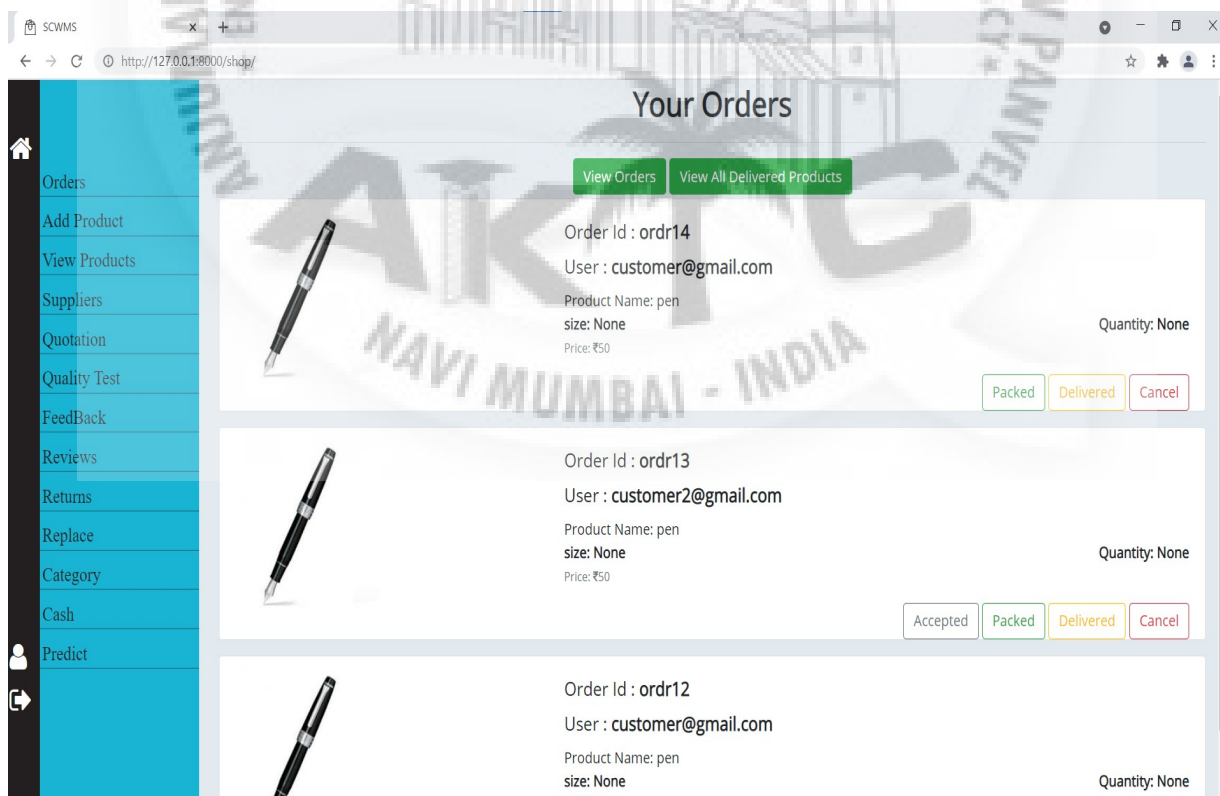


Figure 8.14: Order review page.

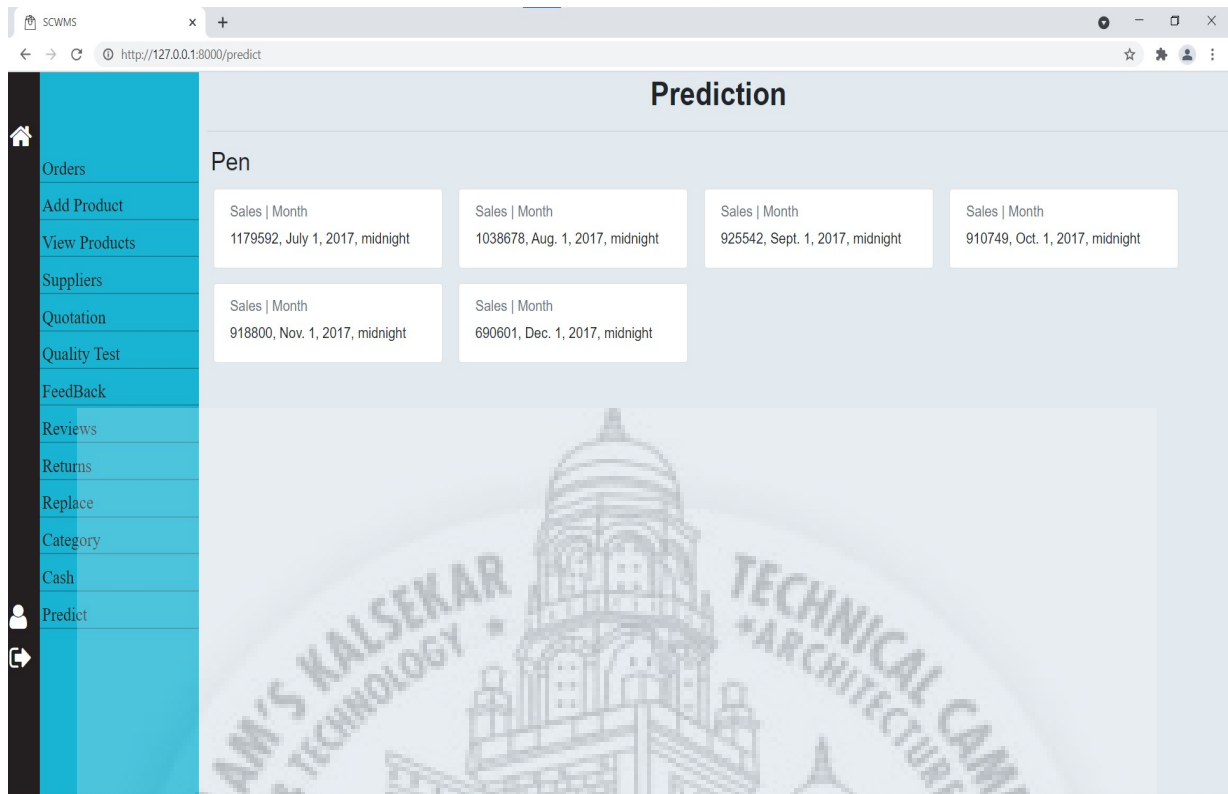


Figure 8.15: Prediction Analysis.



Figure 8.16: Quality Testing.

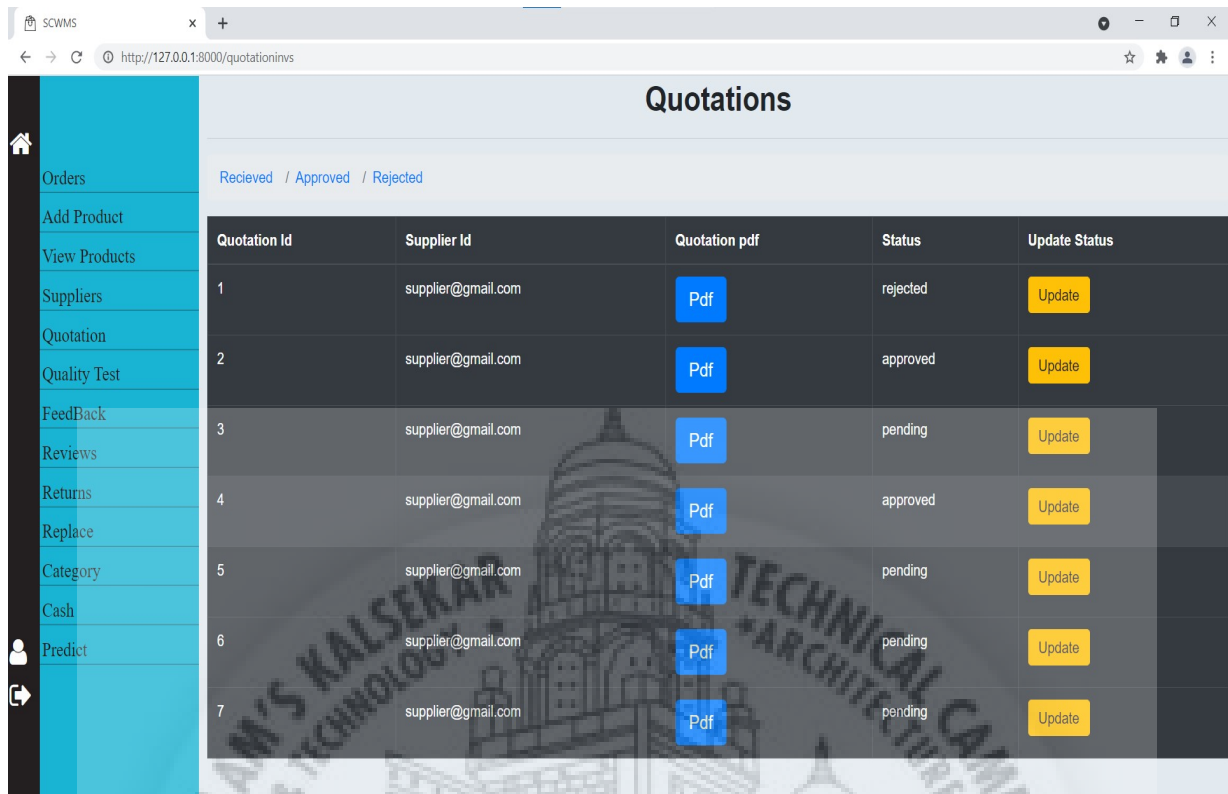


Figure 8.17: View quotation.

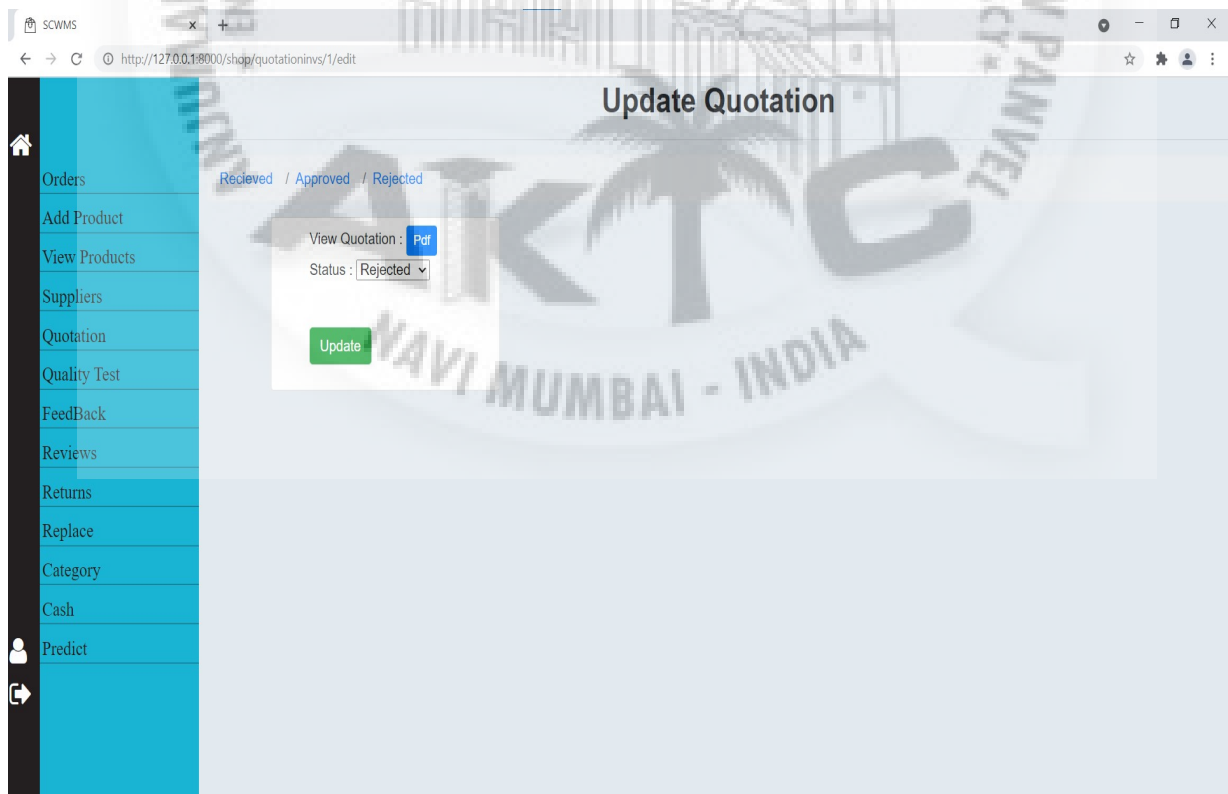
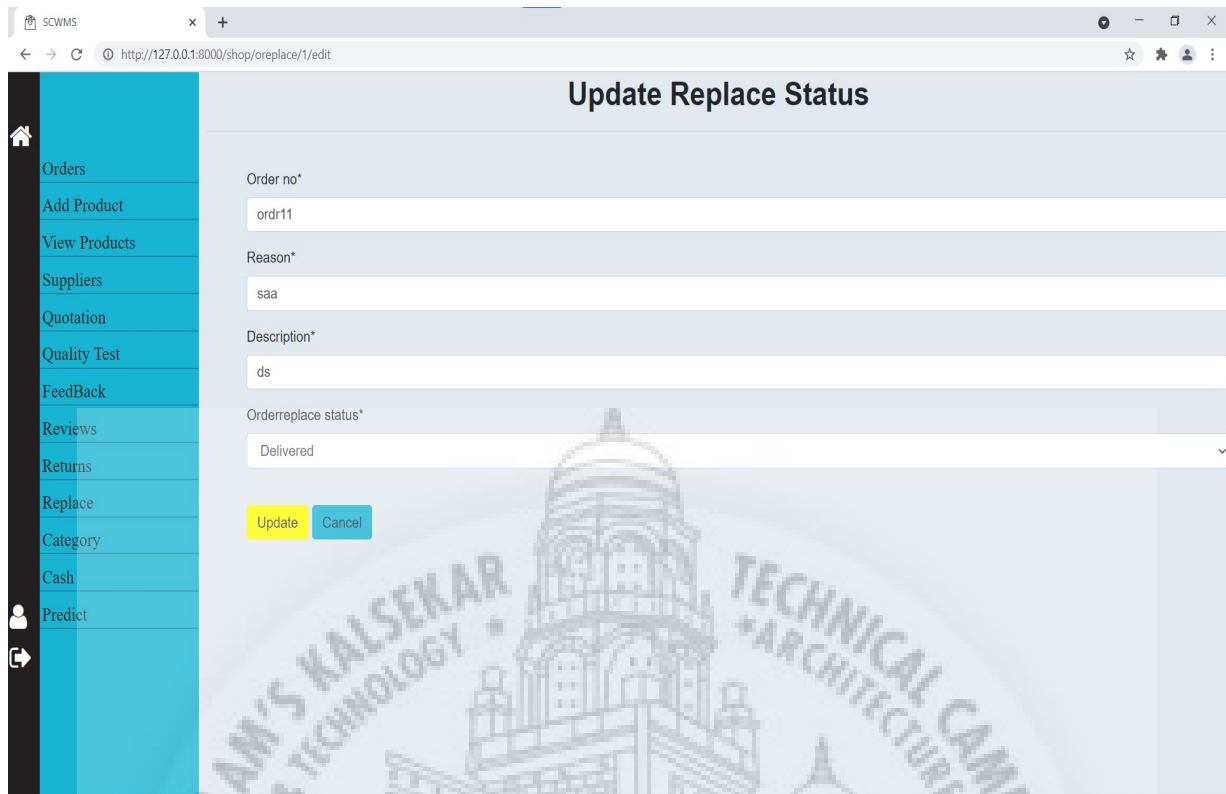


Figure 8.18: Update quotation.

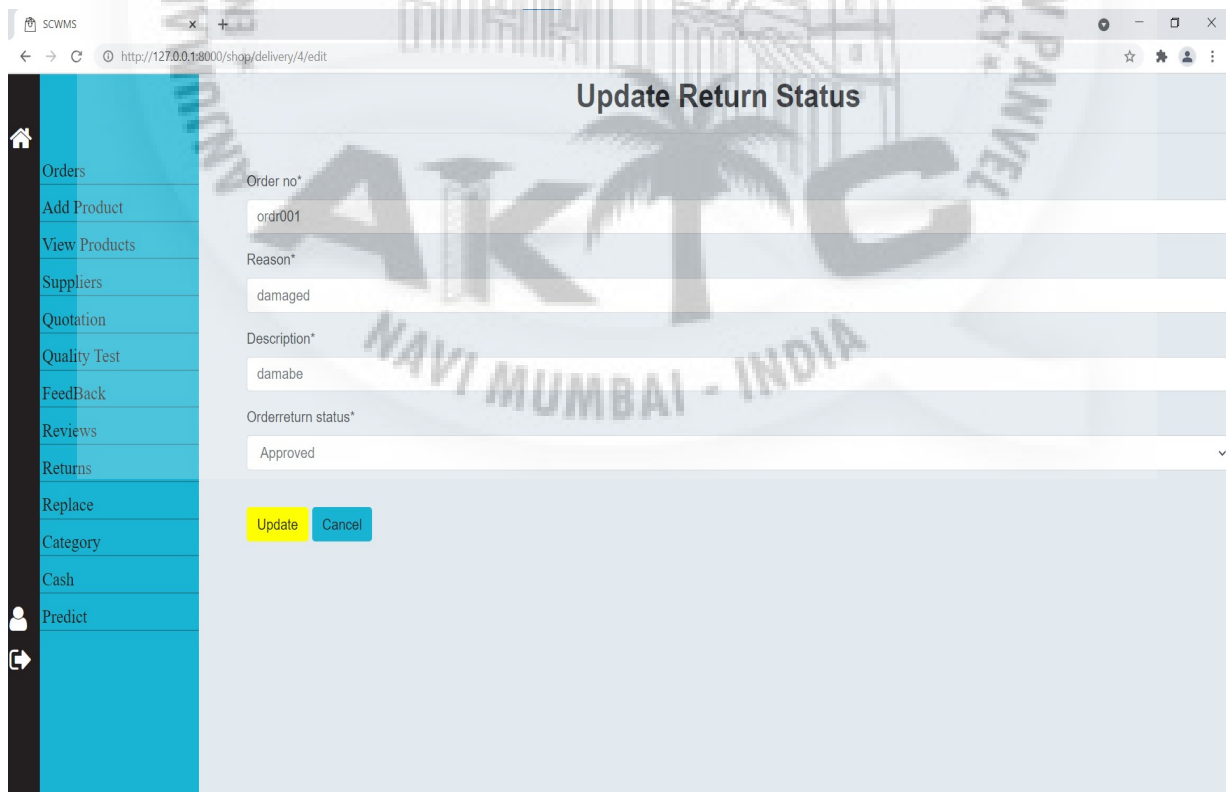


The screenshot shows a web browser window with the URL `http://127.0.0.1:8000/shop/oreplace/1/edit`. The page title is "Update Replace Status". On the left, there is a vertical navigation menu with the following items: Orders, Add Product, View Products, Suppliers, Quotation, Quality Test, FeedBack, Reviews, Returns, Replace, Category, Cash, and Predict. The main form contains the following fields:

- Order no*:
- Reason*:
- Description*:
- Orderreplace status*:

At the bottom of the form, there are two buttons: "Update" (highlighted in yellow) and "Cancel".

Figure 8.19: Update replace status.



The screenshot shows a web browser window with the URL `http://127.0.0.1:8000/shop/delivery/4/edit`. The page title is "Update Return Status". On the left, there is a vertical navigation menu with the following items: Orders, Add Product, View Products, Suppliers, Quotation, Quality Test, FeedBack, Reviews, Returns, Replace, Category, Cash, and Predict. The main form contains the following fields:

- Order no*:
- Reason*:
- Description*:
- Orderreturn status*:

At the bottom of the form, there are two buttons: "Update" (highlighted in yellow) and "Cancel".

Figure 8.20: Update return status.

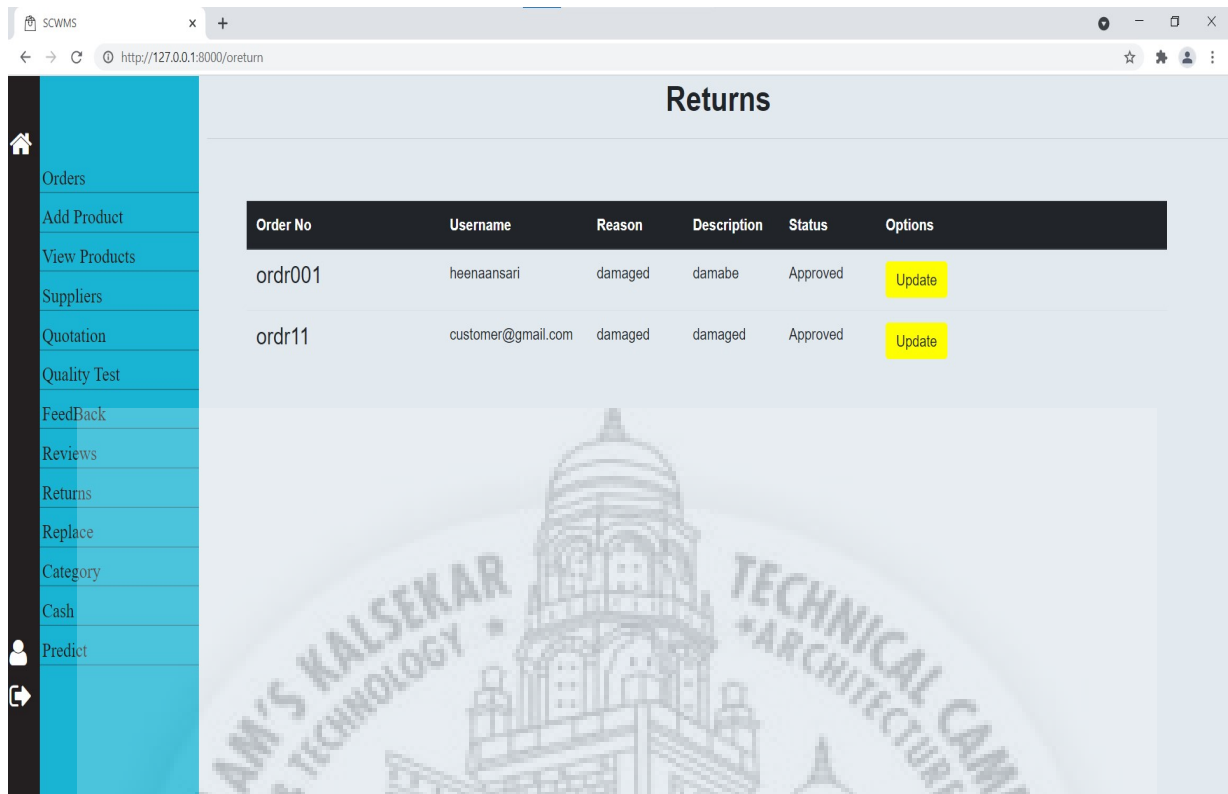


Figure 8.21: View return requests.

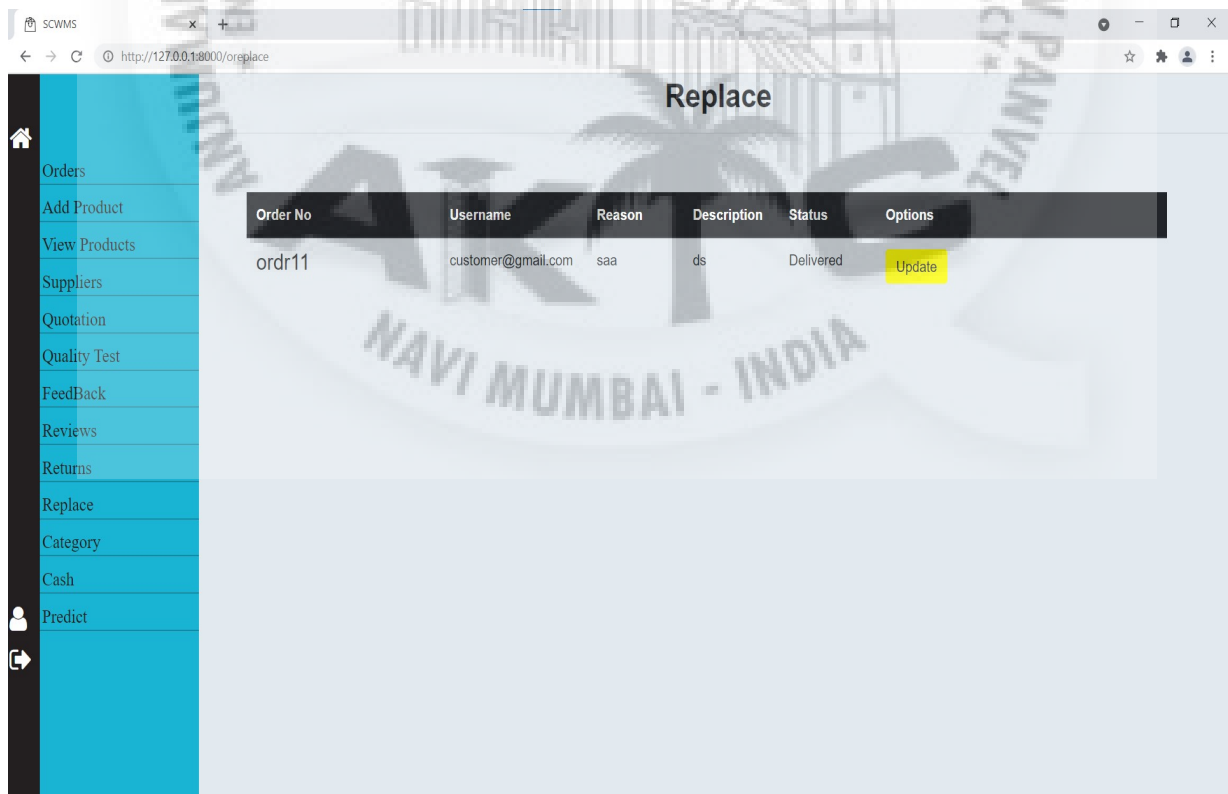
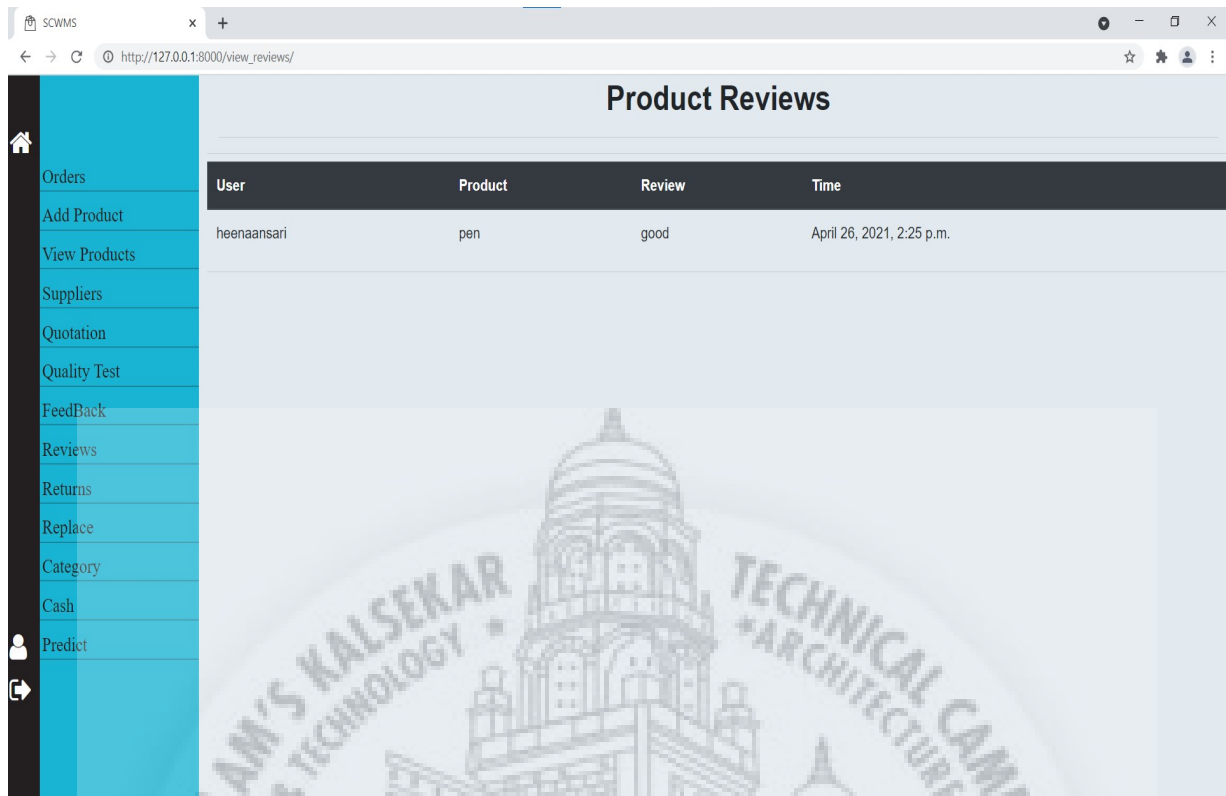


Figure 8.22: View replace request.



The screenshot displays the 'Product Reviews' interface. On the left is a vertical sidebar menu with the following items: Orders, Add Product, View Products, Suppliers, Quotation, Quality Test, FeedBack, Reviews, Returns, Replace, Category, Cash, and Predict. The main content area is titled 'Product Reviews' and contains a table with the following data:

User	Product	Review	Time
heenaansari	pen	good	April 26, 2021, 2:25 p.m.

Figure 8.23: View product reviews.

8.3 Supplier Module

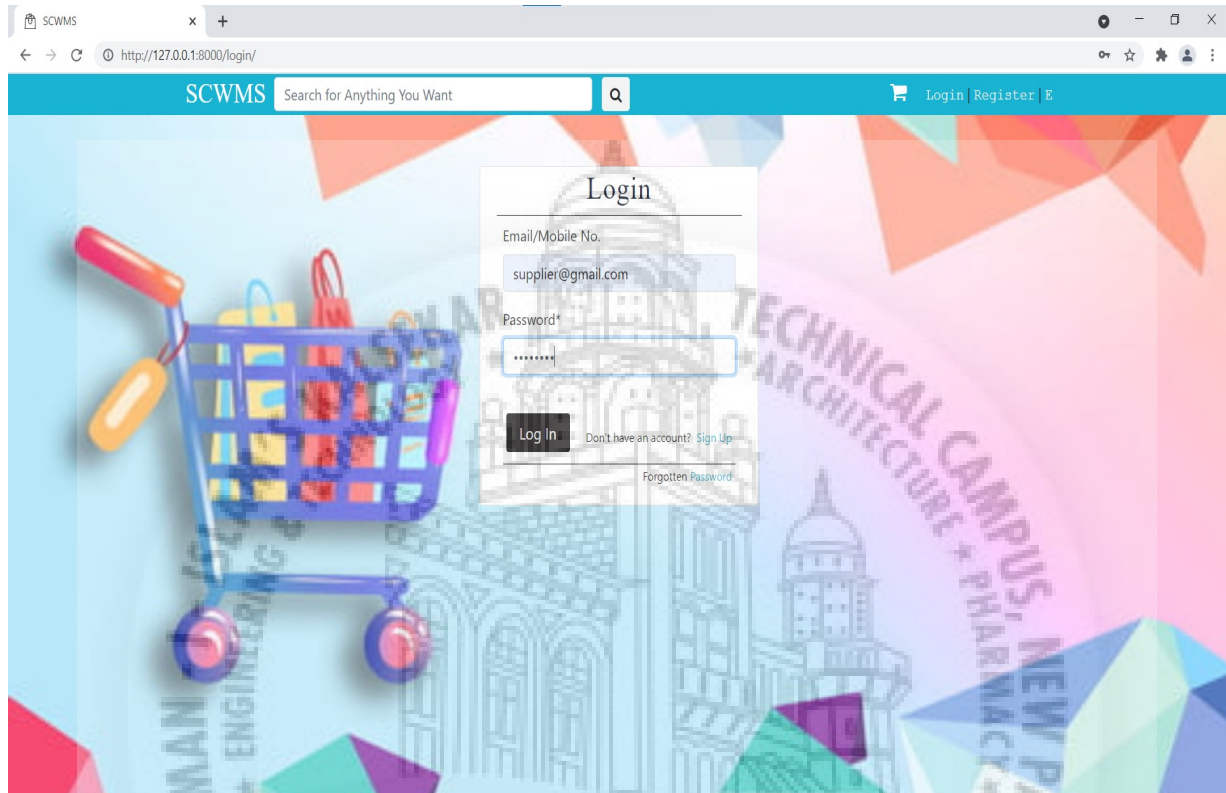


Figure 8.24: Supplier Login Page

The screenshot displays a web application interface for a supplier. The header includes the text 'SUPPLIER ..' and a 'Logout' button. The main content area features a table with the following data:

Quotation Id	Quotation pdf	Quotation status
1	Pdf	rejected
2	Pdf	approved
3	Pdf	pending
4	Pdf	approved
5	Pdf	pending
6	Pdf	pending
7	Pdf	pending

The left sidebar contains two menu items: 'Upload Quotations' and 'Quotations Status'. The browser address bar shows the URL: http://127.0.0.1:8000/s_home/show_quotations_supplier.

Figure 8.25: View quotation.

The screenshot displays a web application interface for a supplier. The header includes the text 'SUPPLIER ..' and a 'Logout' button. The main content area features a form titled 'Upload Quotations' with the following elements:

- Label: 'Quotation pdf*'
- File selection: 'Choose File' button and 'No file chosen' text.
- Submit button: 'Submit Quotations'.

The left sidebar contains two menu items: 'Upload Quotations' and 'Quotations Status'. The browser address bar shows the URL: http://127.0.0.1:8000/s_home/upload_quotation.

Figure 8.26: Upload quotation.

8.4 Warehouse Module

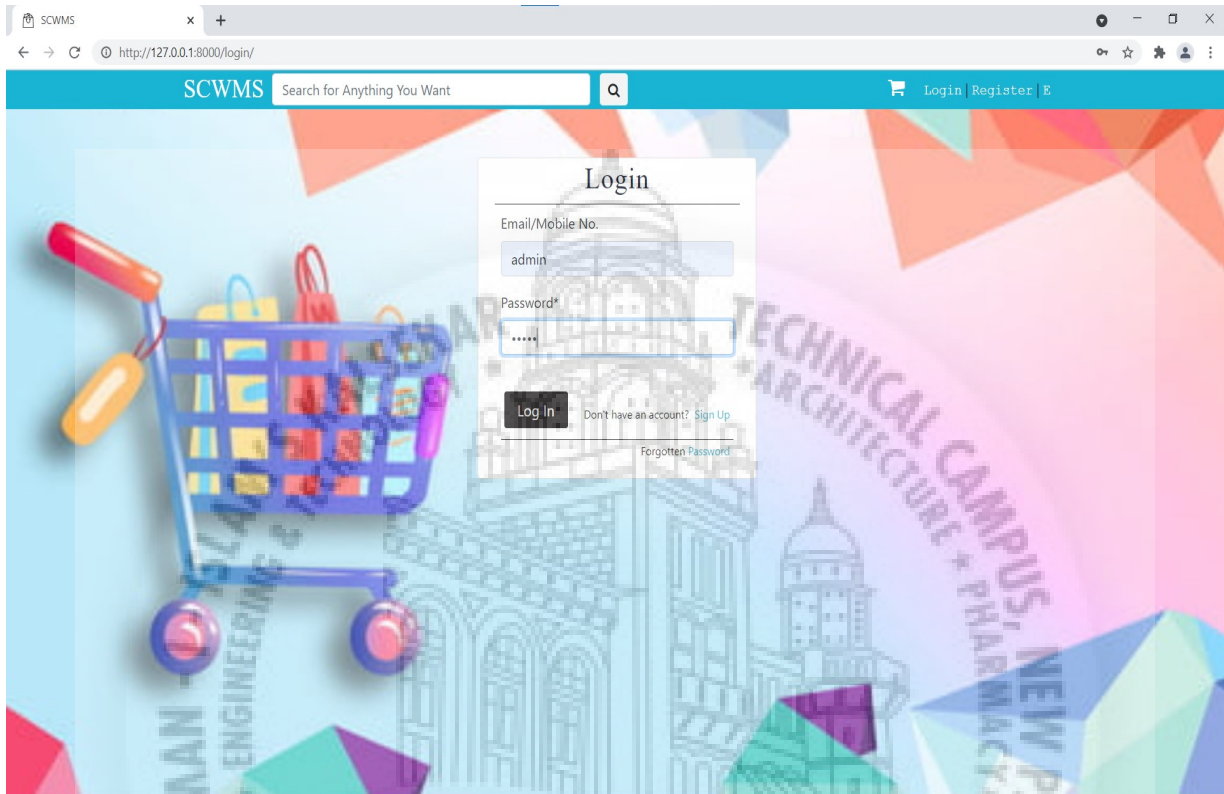


Figure 8.27: Warehouse Employee Login Page.

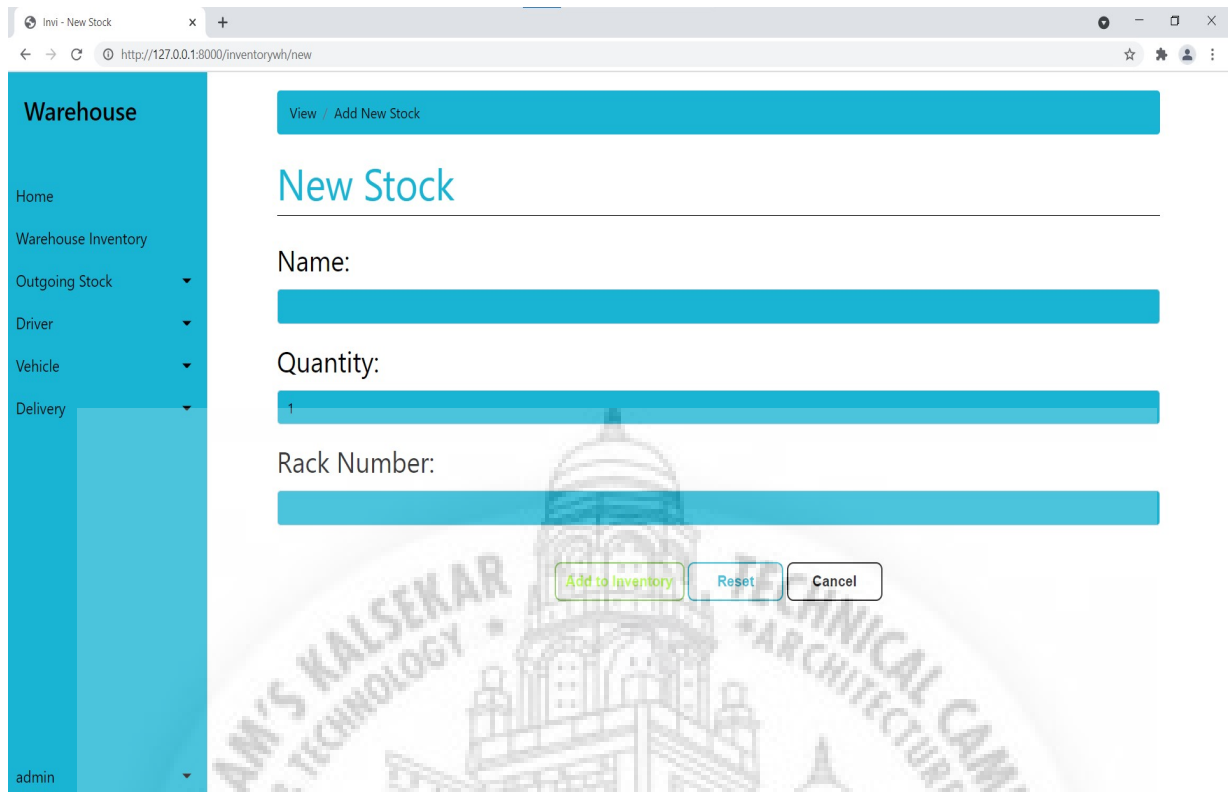


Figure 8.28: Add stock.

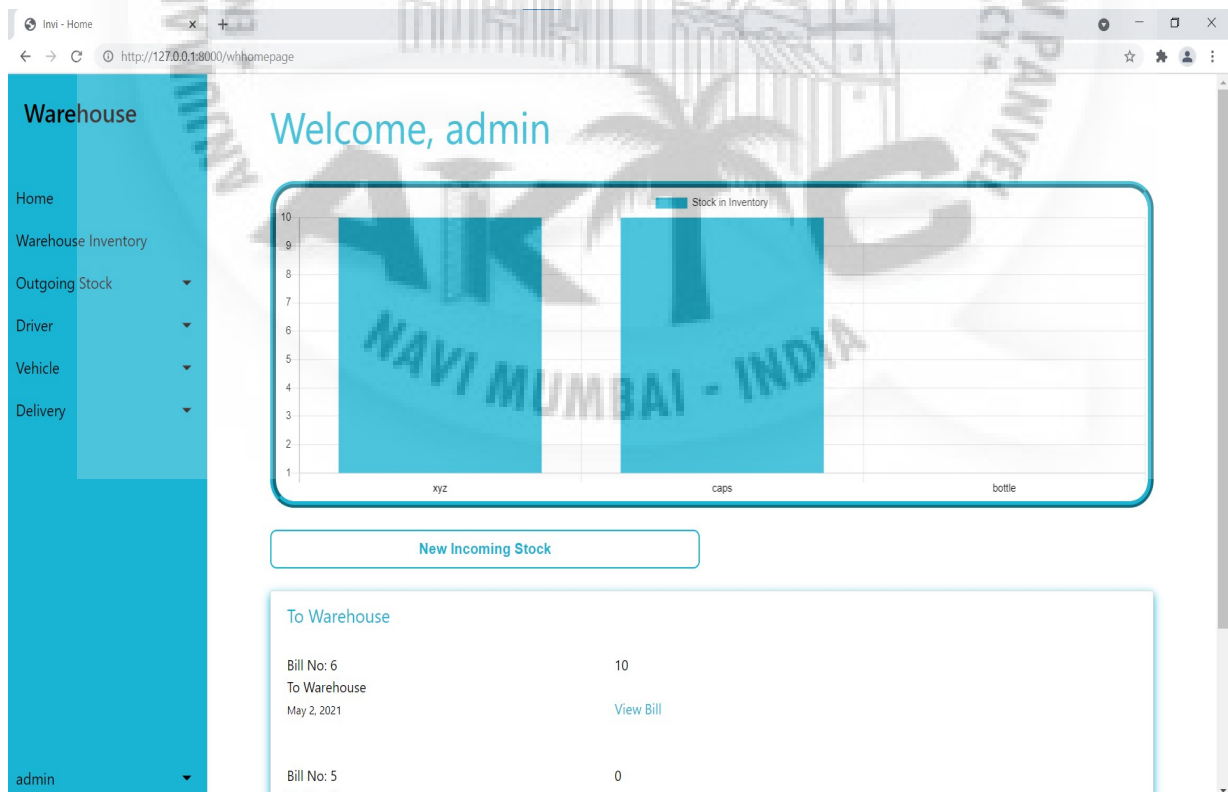


Figure 8.29: Dashboard

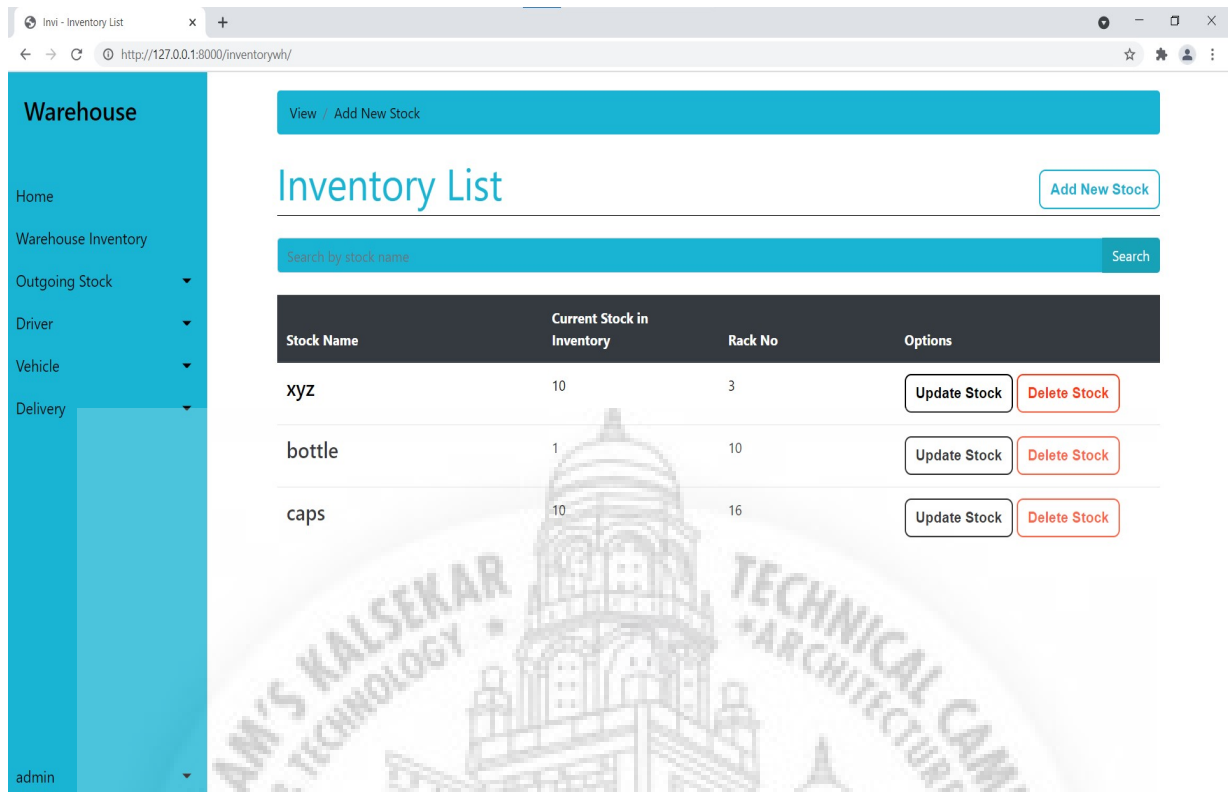


Figure 8.30: Add inventory.

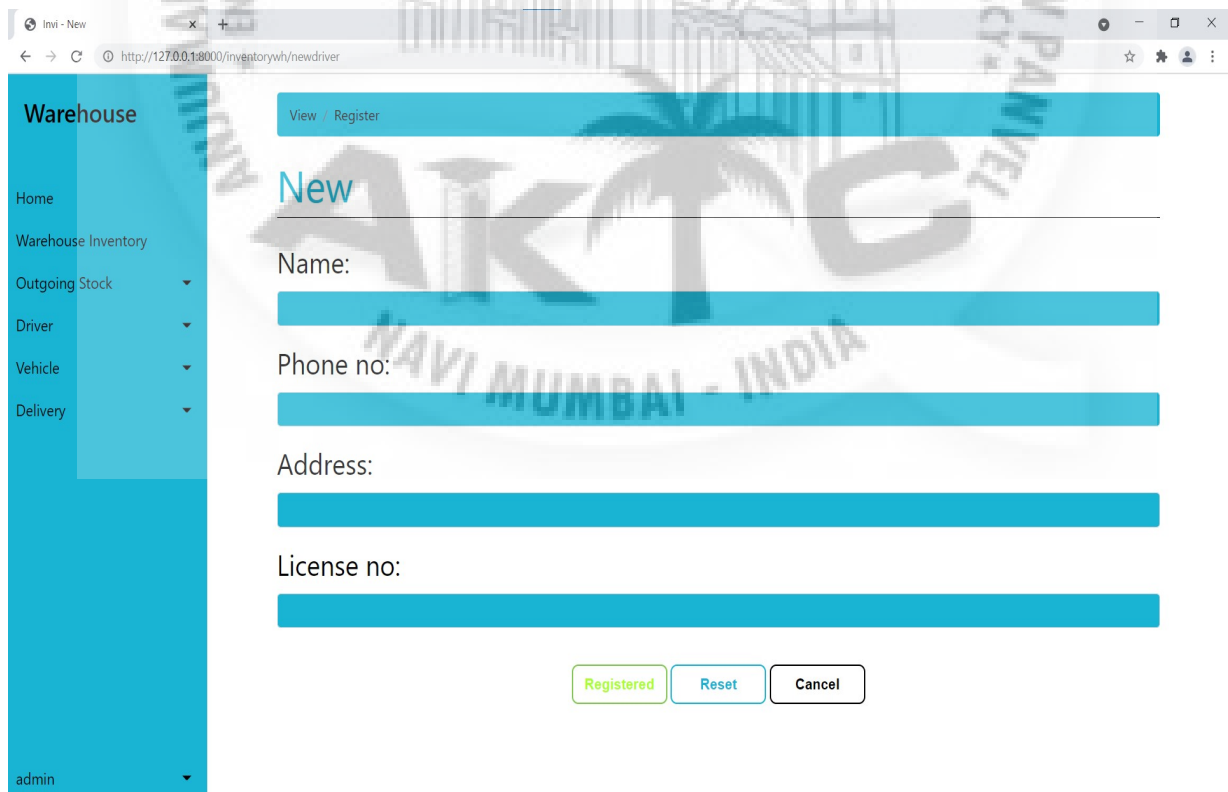


Figure 8.31: Add driver.

The screenshot shows a web browser window with the URL `http://127.0.0.1:8000/inventorywh/newvehicle`. The page has a blue sidebar on the left with the following menu items: Warehouse, Home, Warehouse Inventory, Outgoing Stock, Driver, Vehicle, and Delivery. The main content area has a blue header with 'View / Add New vehicle'. Below the header, the word 'New' is displayed in a large blue font. There are two input fields: 'Name:' and 'Number :'. At the bottom of the form, there are three buttons: 'Added' (green), 'Reset' (blue), and 'Cancel' (white). The user 'admin' is logged in, as shown in the bottom left of the sidebar.

Figure 8.32: Add vehicle.

The screenshot shows a web browser window with the URL `http://127.0.0.1:8000/inventorywh/vehicle/4/edit`. The page has a blue sidebar on the left with the following menu items: Warehouse, Home, Warehouse Inventory, Outgoing Stock, Driver, Vehicle, and Delivery. The main content area has a blue header with 'View / Add New vehicle'. Below the header, the word 'Edit' is displayed in a large blue font. There are three input fields: 'Name:' (containing 'pqr'), 'Number :' (containing 'mh034567'), and 'Status :' (with a dropdown menu showing 'Unavailable'). At the bottom of the form, there are three buttons: 'Update' (green), 'Delete' (red), and 'Cancel' (white). The user 'admin' is logged in, as shown in the bottom left of the sidebar.

Figure 8.33: Update vehicle status.

Chapter 9

Conclusion and Future Scope

9.1 Conclusion

With growing demand for various goods and services it is crucial to have an effective system to manage all the concerned processes. This system helps to monitor and maintain all the processes related to supply chain and warehouse management. Supply chain and warehouse management is important for keeping cost down while meeting regulations. Demand and supply needs to be balanced for a prospering business. In the present scenario of globalization and privatization effective supply chain management is an important aspect for large as well as small scale business and companies. Effective production helps to reduce the wastage and increase profit. Effective supply chain management (SCM) has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains. This research conceptualizes and develops five dimensions of SCM practice - strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement and tests the relationships between SCM practices, competitive advantage, and organizational performance.

9.2 Future Scope

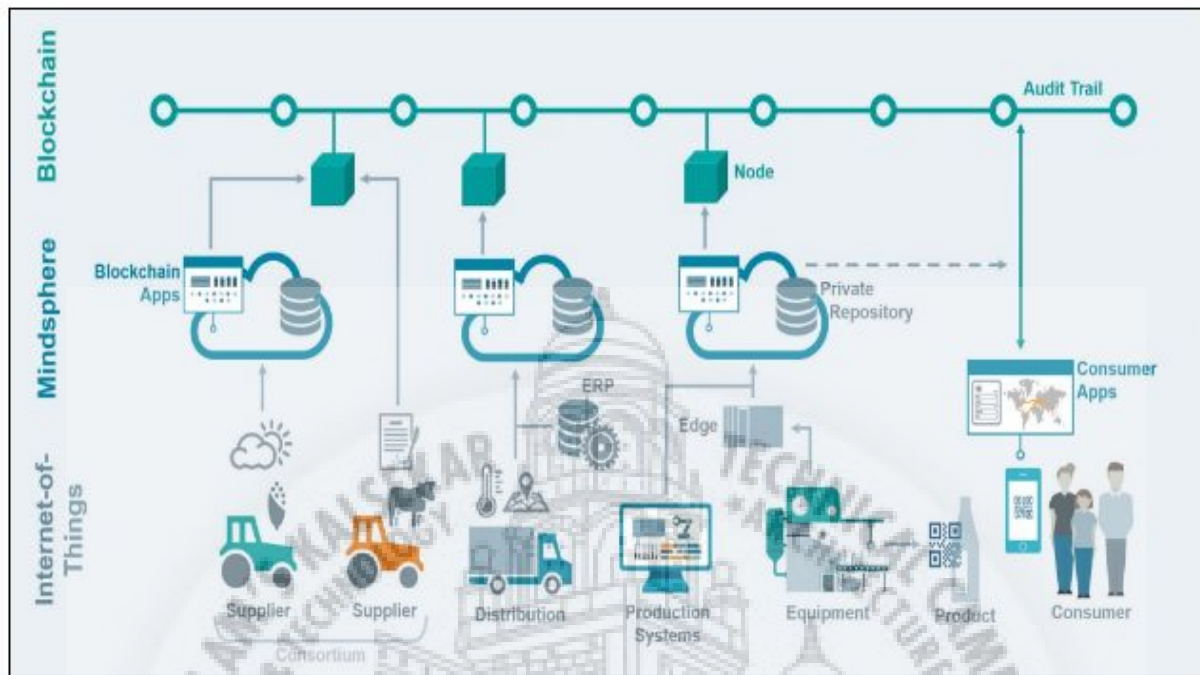


Figure 9.1: Future Scope.

- **Integrating the system with IOT :** This will provide a coherent stream of real-time data regarding the location of the product and the transportation environment. It will help the tracking even more efficiently. The user will be alerted if the product is shipped in the wrong direction and will be able to monitor the delivery of ready goods and raw materials.
- **Integrating the input mechanism with RFID :** Instead of gathering inventory data manually, staff members can outsource the task to a range of connected sensors or RFID tags. The data is then stored on a cloud-based platform, processed and analyzed. Finally, a user sees condensed inventory or other warehouse-related data in a clear way via a visual dashboard.
- **Integrating the system with Cloud Computing:** It provides optimization by providing infrastructure , platform and software solutions for supply chain networks and leads to financial and operational benefits. It also helps to improve the scalability of the system.

References

- [1] *Research on and Implementation of the Logistics Warehouse Management System*; Jie Chang, 2016 2nd International Conference on Social Science and Technology Education (ICSSTE 2016).
- [2] *Effects of Warehouse Management and engineering system on cost reduction and operations improvement*; Harb, Atef Kassem, Abdallah Chartouni, Marie Chaaya, Lina. Sixth International Conference on Digital Information Processing and Communications (ICDIPC)(2016).
- [3] *Supply Chain Management: The Influence of SCM on Production Performance and Product Quality*; Arawati Agus, Member, IACSIT, Journal of Economics, Business and Management, Vol. 3, No. 11, November 2015.
- [4] <https://softwareconnect.com/supply-chain-management/>
- [5] <https://www.ibm.com/in-en/supply-chain>
- [6] <https://www.g2.com/products/oracle-supply-chain-management>