Visvesvaraya Technological University
Belagavi-590 018, Karnataka

A Mini Project Report on

"Supply Chain Management System"

Mini Project Report submitted in partial fulfilment of the requirement for the DBMS Laboratory with Mini Project [18CSL58]

BACHELOR OF ENGINEERING
IN
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Submitted by
Dheeraj N Kashyap [1JT20AI007]

Under the guidance of
Dr. Madhu B R
HOD & Professor
Department of Artificial Intelligence and Machine Learning

Prof. Soumya K N
Assistant Professor
Department of Artificial Intelligence and Machine Learning

Department of Artificial Intelligence and Machine Learning
Jyothy Institute of Technology Tataguni,
Bengaluru-560082

Jyothy Institute of Technology
Tataguni, Bengaluru-560082
Department of Artificial Intelligence and Machine Learning

CERTIFICATE

Certified that the mini project work entitled **"Supply Chain Management System"** carried out by **Dheeraj N Kashyap** [**1JT20AI007**] **and Girish S** [**1JT20AI008**] bonafide students of Jyothy Institute of Technology, in partial fulfilment for the award of **Bachelor of Engineering** in **Artificial Intelligence and Machine Learning** department of the **Visvesvaraya Technological University**, **Belagavi** during the year **2022- 2023**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Mrs. Soumya K N
Guide, Asst. Professor
Dept. of AIML

Dr. Madhu B R
HOD & Professor
Dept. of AIML

External Examiner

1.

2.

Signature with Date*:*

ACKNOWLEDGEMENT

Firstly, we are very grateful to this esteemed institution **"Jyothy Institute of Technology**" for providing us an opportunity to complete our project.

We express our sincere thanks to our **Principal Dr. Gopalakrishna K** for providing us with adequate facilities to undertake this project.

We would like to thank **Dr. Madhu B R**, **Professor and Head of AIML** Department for providing for his valuable support.

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Finally, we would thank all our friends who have helped us directly or indirectly in this project.

Dheeraj N Kashyap [1JT20AI007]

ABSTRACT

Supply chain management is the coordination and management of activities involved in the production and delivery of goods and services from raw material sourcing to end customer consumption. It involves optimizing the flow of goods, information and finances to minimize costs, increase efficiency and ensure customer satisfaction. Supply chain management also involves managing relationships with suppliers, manufacturers, distributors, and customers to improve overall performance and mitigate risk.

The project on supply chain management aims to provide a comprehensive understanding of the various aspects involved in managing the flow of goods and services from the point of origin to the point of consumption. The objective is to analyze the current trends and practices in the supply chain industry and identify areas of improvement. The study will be conducted through primary and secondary research methods and will involve extensive data analysis and case studies of successful supply chain management models. The project will also include an evaluation of the various tools and technologies used in supply chain management and how they can be leveraged to enhance the overall performance of the supply chain. The results of the project will provide insights into the current state of the supply chain industry and identify the best practices that organizations can adopt to optimize their supply chain performance. The findings of the project will be useful for organizations looking to improve their supply chain management processes and enhance their competitiveness in the market.

TABLE OF CONTENT

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

1.1 INTRODUCTION TO DBMS:

A database management system refers to technology for creating and managing databases. DBMS is a software tool to organize (create, retrieve, update and manage) data in a database. The main aim of DBMS is to supply a way to store up and retrieve database information that is both convenient and efficient.

Advantages of databases:

- To develop software applications in less time.
- Data independence and efficient use of data.
- For uniform data administration.
- For data integrity and security.
- To use user-friendly declarative query language.

1.2 INTRODUCTION TO SQL:

SQL is an abbreviation of structured query language, is a language to request data from a database, to add, update, remove data within a database, or to manipulate the metadata of the database.

SQL is a declarative language in which the expected result or operation is given without the specific details about how to accomplish the task. The steps required to execute SQL statement are handled transparently by the SQL database. Sometimes SQL is characterised as non-procedural because procedural language generally require the details of the operations to be specified, such as opening and closing tables, loading and searching indexes, or flushing buffers and writing data to file system. Therefore, SQL is considered to be designed at a higher conceptual level of operation than procedural languages because the lower level logical and physical operation aren't specified and are determined b the SQL engine or server process that executes it.

1.3 INTRODUCTION TO SUPPLY CHAIN MANAGEMENT SYSTEM:

A supply chain is a network of businesses, organizations, and individuals that work together to source, produce, and deliver products or services to customers. It includes all activities involved in sourcing raw materials, manufacturing, distributing, and delivering a product or service to the end user. Effective supply chain management is crucial for businesses to ensure that products are delivered on time and at the right cost to meet customer demand.

1.4 SCOPE AND IMPORTANCE OF WORK:

Supply chain management (SCM) is a crucial business function that encompasses the planning, coordination, and control of all activities involved in the production and delivery of goods and services to customers.

The scope of an SCM project typically includes:

1.Sourcing raw materials and components

2.Manufacturing and assembly of products

3.Warehousing and storage

4.Order fulfillment and delivery to customers

5.Reverse logistics (handling returns and customer complaints)

The importance of SCM lies in its ability to improve efficiency, increase customer satisfaction, and enhance overall business performance. A well-designed and effectively executed SCM project can result in:

1.Improved product availability and reduced lead times

2.Increased agility in responding to market demand and changing customer needs

3.Enhanced cost control through optimized use of resources and minimized waste

4.Improved supplier relationships and increased collaboration across the supply chain

5.Enhanced end-to-end visibility and control, enabling proactive decision making and risk management.

CHAPTER 2

DESIGN

2. THEORY OF ER DIAGRAM

2.1 THEORY OF ER DIAGRAM :

An entity relationship diagram shows the relationships of entity sets stored in a database. It mainly describes the structure of a database with the help of a diagram, which is so called the entity relationship diagram. An ER model is the design or blueprint of the database that can later be implemented as a database. The main components of ER model are as said above entity set and relationship set.

In ER (Entity Relationship) diagrams, relationships between entities can be classified into four types:

1. One-to-One (1:1): A one-to-one relationship is established between two entities, where one entity is related to exactly one instance of the other entity. For example, one person can have one passport.
2. One-to-Many (1:N): A one-to-many relationship is established between two entities, where one entity is related to many instances of the other entity. For example, one department can have many employees.
3. Many-to-One (N:1): A many-to-one relationship is established between two entities, where many instances of an entity are related to exactly one instance of the other entity. For example, many products belong to one category.
4. Many-to-Many (N:M): A many-to-many relationship is established between two entities, where many instances of one entity are related to many instances of the other entity. For example, a student can enroll in many courses, and a course can have many students. To implement a many-to-many relationship, a separate entity is introduced to store the relationship between the two entities.

These relationships are used to model the relationship between entities in a database and define how data can be stored and retrieved from the database.

2.1.1 ENTITIES:

An entity is an object that exists. It doesn't have to do anything, it just has to exit. In database administration, an entity can be a single thing, person, place, or an object. Data can be stored about such entities. A design tool that allows database administration to view the relationships between several entities is basically called as an ER diagram.

2.1.2 RELATIONSHIPS:

A relational database collects different types of data sets that use tables, records, and columns. It is used to create a well-defined relationship between database tables so that relational database can be easily stored. For example, say we need to have a connection between the two entities such as staff and customer we can connect them using the relationship say staff serves customer where serves is the relation that exists between them.

2.1.3 ATTRIBUTES:

In general, an attribute is a characteristic. In a database management system, an attribute refers to a database component, such as a table.
It also may refer to a database field. Attributes describe the instances in the column of a database.

2.2 ER DIAGRAM

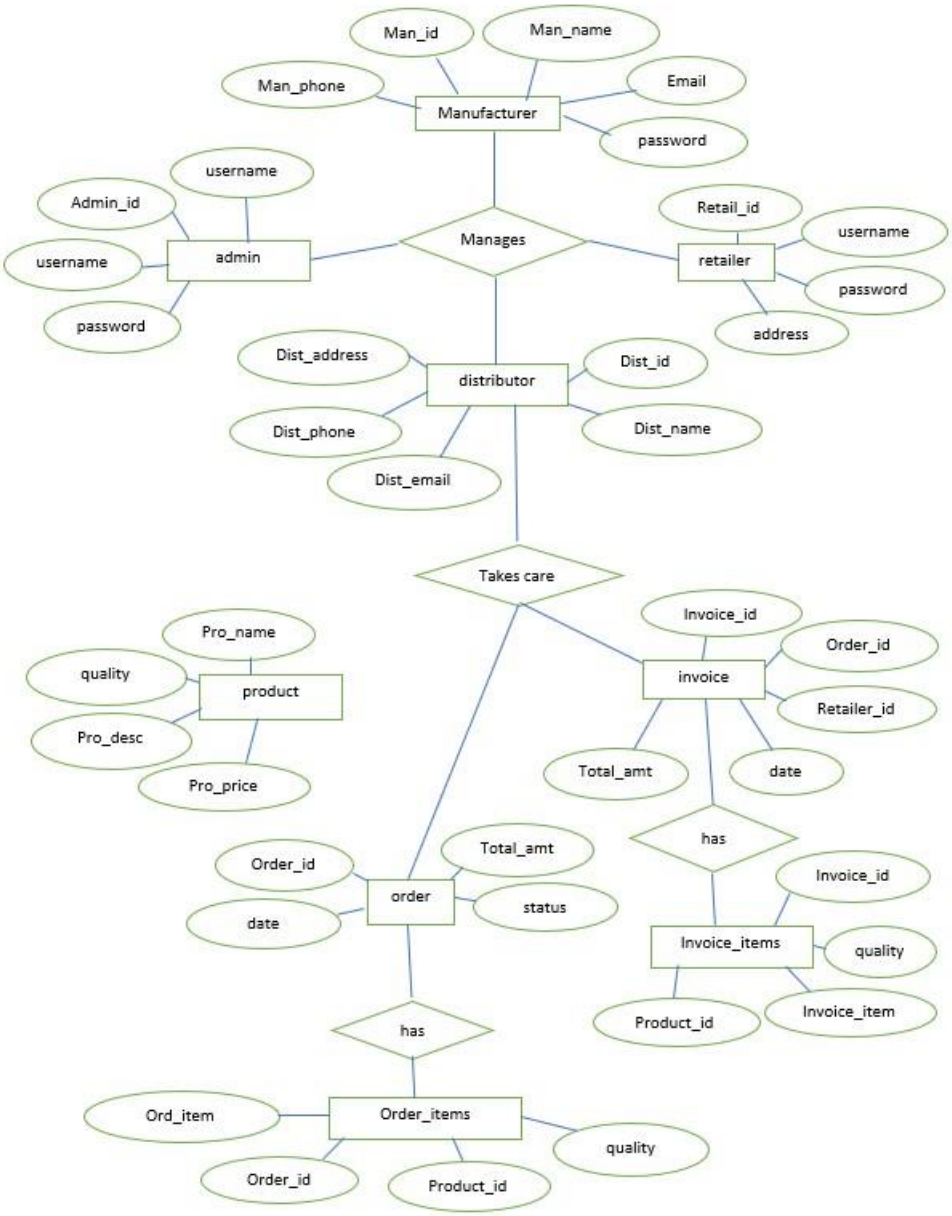


Fig 2.4 ER-diagram for Supply chain management system

2.3 SCHEMA DIAGRAM

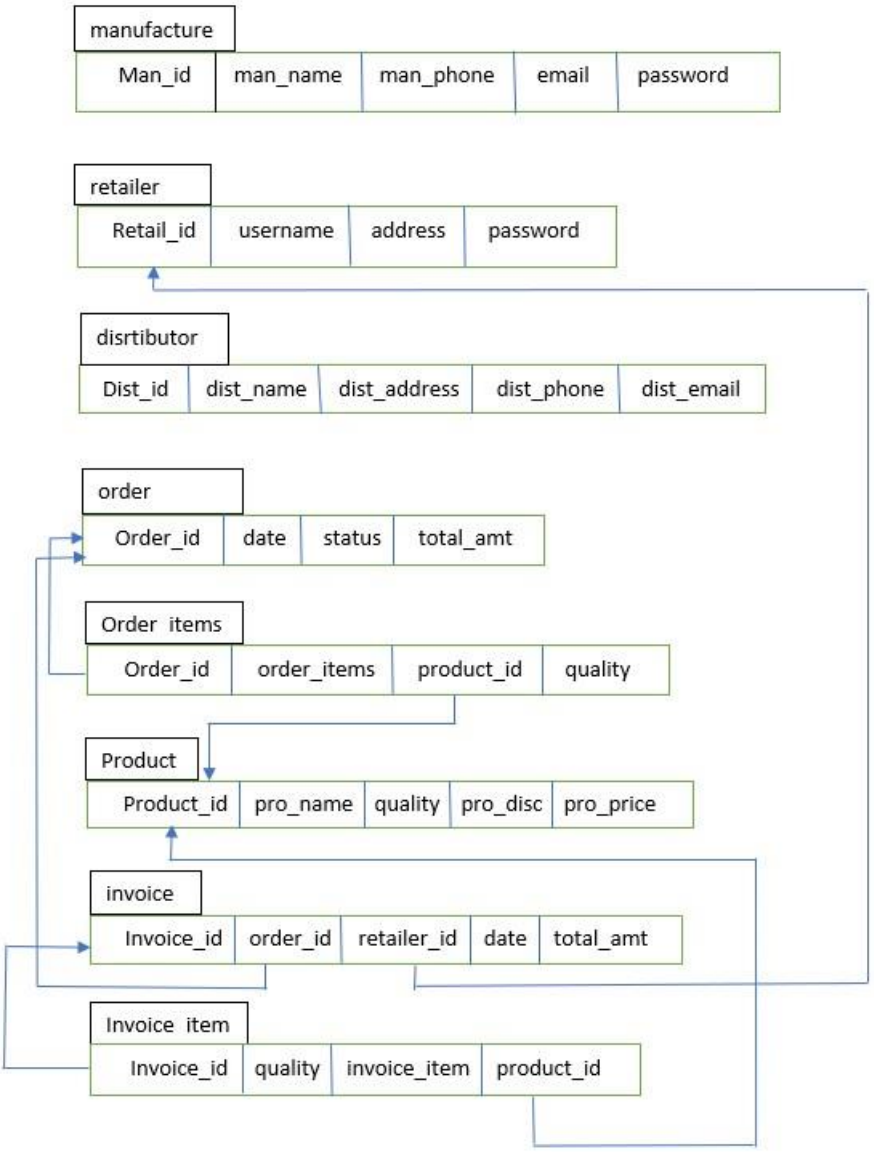


Fig 2.5 schema diagram for supply chain management system

2.4 LIST OF TABLES:

1.Manufacturer
2. Retailer
3.Distributor
4.Order
5.Order_items
6.Product
7.Invoice
8.Invoice_items

CHAPTER 3

IMPLEMENTATION

3.1 CREATION OF TABLE :

CREATE TABLE AREA (AREA_ID INT(11) PRIMARY KEY,AREA_NAME VARCHAR(50),AREA_CODE VARCHAR(10));

CREATE TABLE DISTRIBUTOR(DIST_ID INT(11)PRIMARY KEY,DIST_NAME VARCHAR(25),DIST_EMAIL VARCHAR(50),DIST_PHONE VARCHAR(10),DIST_ADDRESS VARCHAR(200));

CREATE TABLE INVOICE(INVOICE_ID INT(11),ORDER_ID INT(11),RETAILER_ID INT(11),DIST_ID INT(11),DATE (DATE),TOTAL_AMOUNT DECIMAL(10,3),COMMENTS (TEXT),FOREIGN KEY (ORDER_ID)REFERENCES ORDER(ORDER_ID),FOREIGN KEY(RETAILER_ID)REFERENCES RETAILER(RETAILER_ID),FOREIGN KEY(DIST_ID)REFERENCES DISTRIBUTOR(DIST_ID)ON DELETE CASCADE);

CREATE TABLE INVOICE_ITEMS(INVOICE_ITEMS_ID INT(11)PRIMARY KEY,INVOICE_ID INT(11),PRODUCT_ID INT(11),QUANTITY INT(6),FOREIGN KEY(INVOICE_ID)REFERENCES INVOICE(INVOICE_ID)FOREIGN KEY(PRODUCT_ID)REFERENCES PRODUCTS(PRODUCT_ID)ON DELETE CASCADE);

CREATE TABLE MANUFACTURER(MAN_ID INT(11)PRIMARY KEY,MAN_NAME VARCHAR(25),MAN_EMAIL VARCHAR(50),MAN_PHONE VARCHAR(10),USERNAME VARCHAR(20),PASSWORD VARCHAR(20));

CREATE TABLE ORDER(ORDER_ID INT(11),DATE (DATE),RETAILER_ID INT(11),APPROVED TINYINT(1),STATUS TINYINT(1),TOTAL_AMOUNT DECIMAL(10,3),FOREIGN KEY(RETAILER_ID)REFERENCES RETAILER(RETAILER_ID)ON DELETE CASCADE);

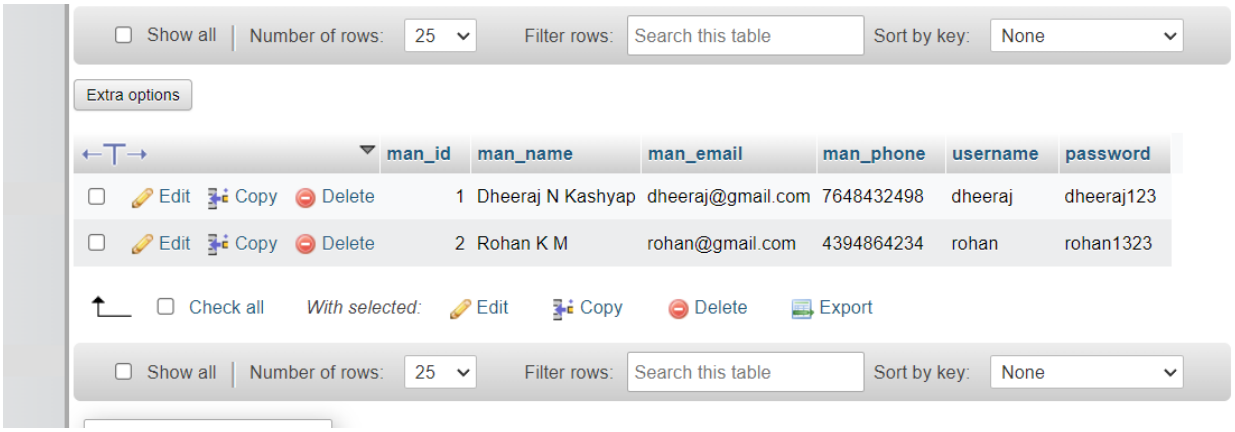
CREATE TABLE ORDER_ITEMS(ORDER_ITEMS_ID INT(11)PRIMARY KEY,ORDER_ID INT(11),PRO_ID INT(11),QUANTITY INT(6),FOREIGN KEY(ORDER_ID)REFERENCES ORDER(ORDER_ID),FOREIGN KEY(PRO_ID)REFERENCES PRODUCTS(PRO_ID)ON DELETE CASCADE);

CREATE TABLE RETAILER(RETAILER_ID INT(11)PRIMARY KEY,USERNAME VARCHAR(25),PASSWORD VARCHAR(25),ADDRESS VARCHAR(200),AREA_ID INT(11),PHONE VARCHAR(10),EMAIL VARCHAR(50),FOREIGN KEY(AREA_ID)REFERENCES AREA(AREA_ID)ON DELETE CASCADE);

CREATE TABLE PRODUCTS(PRO_ID INT(11)PRIMARY KEY,USERNAME VARCHAR(25),PRO_DESC (TEXT),PRO_PRICE DECIMAL(10,3),UNIT INT(11),QUANTITY INT(6),FOREIGN KEY(UNIT)REFERENCES UNIT(UNIT) ON DELETE CASCADE);

CREATE TABLE UNITS(UNIT_ID INT(11)PRIMARY KEY,UNIT_NAME VARCHAR(20),UNIT_DETAILS (TEXT));

3.2 IMPLEMENTATION:



Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

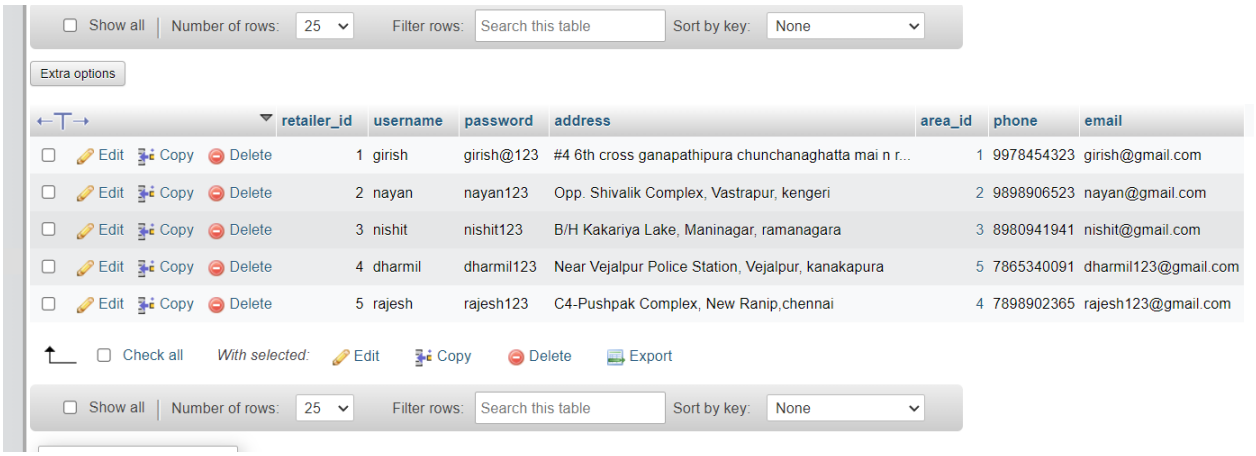
Extra options

	man_id	man_name	man_email	man_phone	username	password
Edit Copy Delete	1	Dheeraj N Kashyap	dheeraj@gmail.com	7648432498	dheeraj	dheeraj123
Edit Copy Delete	2	Rohan K M	rohan@gmail.com	4394864234	rohan	rohan1323

Check all *With selected:* Edit Copy Delete Export

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Fig 3.2(a) : Manufacturer



Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

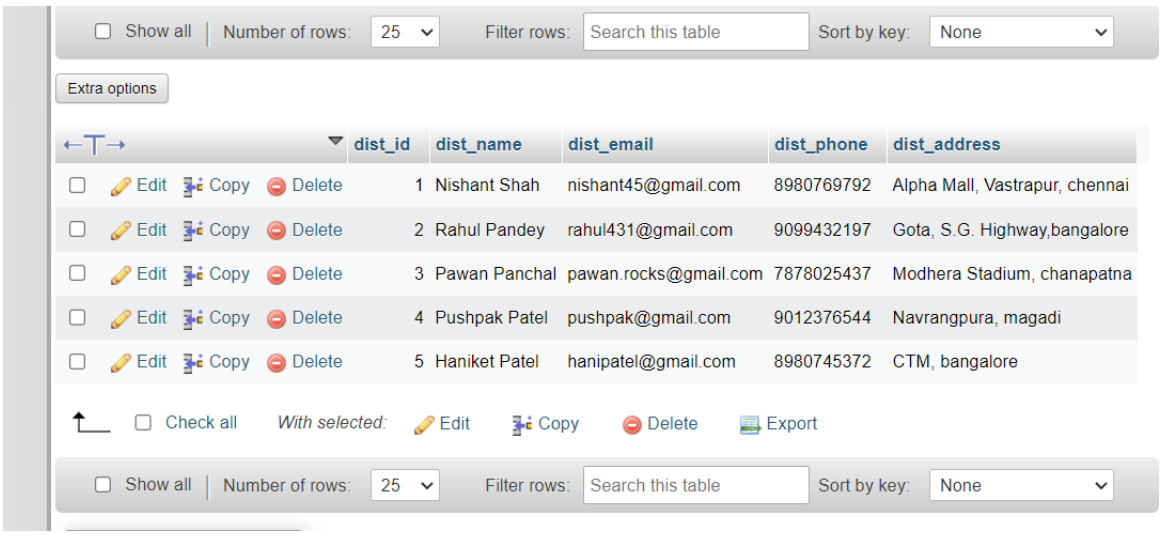
Extra options

	retailer_id	username	password	address	area_id	phone	email
Edit Copy Delete	1	girish	girish@123	#4 6th cross ganapathipura chunchanaghatta mai n r...	1	9978454323	girish@gmail.com
Edit Copy Delete	2	nayan	nayan123	Opp. Shivalik Complex, Vastrapur, kengeri	2	9898906523	nayan@gmail.com
Edit Copy Delete	3	nishit	nishit123	B/H Kakariya Lake, Maninagar, ramanagara	3	8980941941	nishit@gmail.com
Edit Copy Delete	4	dharmil	dharmil123	Near Vejalpur Police Station, Vejalpur, kanakapura	5	7865340091	dharmil123@gmail.com
Edit Copy Delete	5	rajesh	rajesh123	C4-Pushpak Complex, New Ranip,chennai	4	7898902365	rajesh123@gmail.com

Check all *With selected:* Edit Copy Delete Export

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Fig 3.2(b) : Retailer



Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	dist_id	dist_name	dist_email	dist_phone	dist_address
Edit Copy Delete	1	Nishant Shah	nishant45@gmail.com	8980769792	Alpha Mall, Vastrapur, chennai
Edit Copy Delete	2	Rahul Pandey	rahul431@gmail.com	9099432197	Gota, S.G. Highway,bangalore
Edit Copy Delete	3	Pawan Panchal	pawan.rocks@gmail.com	7878025437	Modhera Stadium, chanapatna
Edit Copy Delete	4	Pushpak Patel	pushpak@gmail.com	9012376544	Navrangpura, magadi
Edit Copy Delete	5	Haniket Patel	hanipatel@gmail.com	8980745372	CTM, bangalore

Check all *With selected:* Edit Copy Delete Export

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Fig 3.2(c) : Distributor

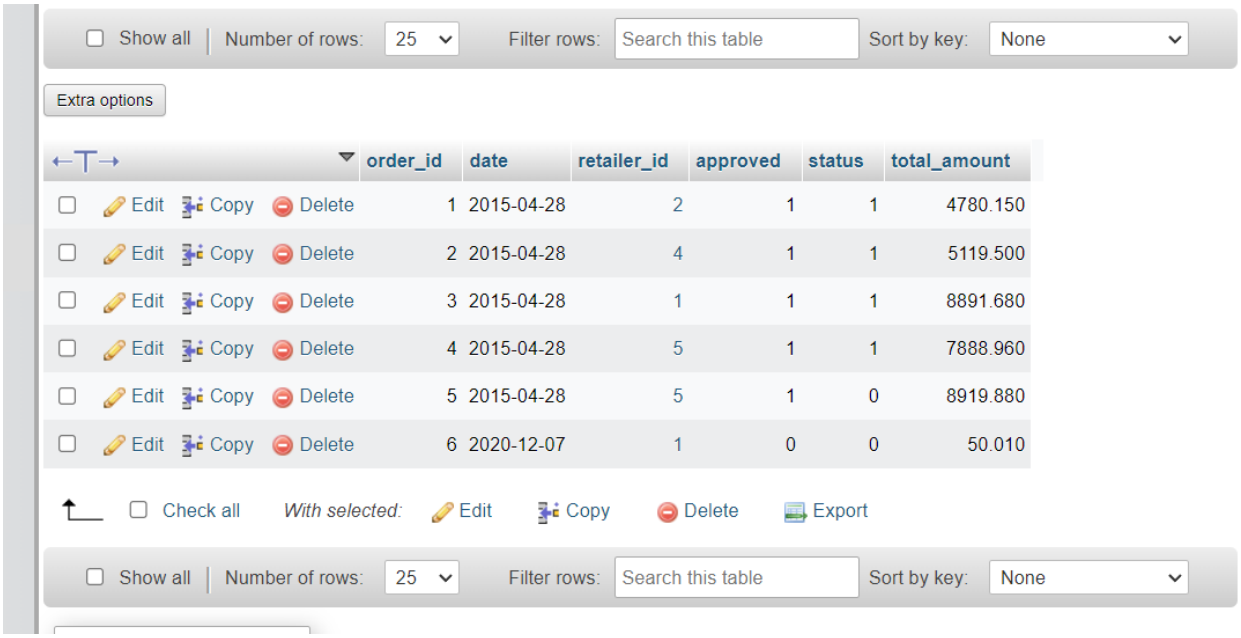


Fig 3.2(d) : Order

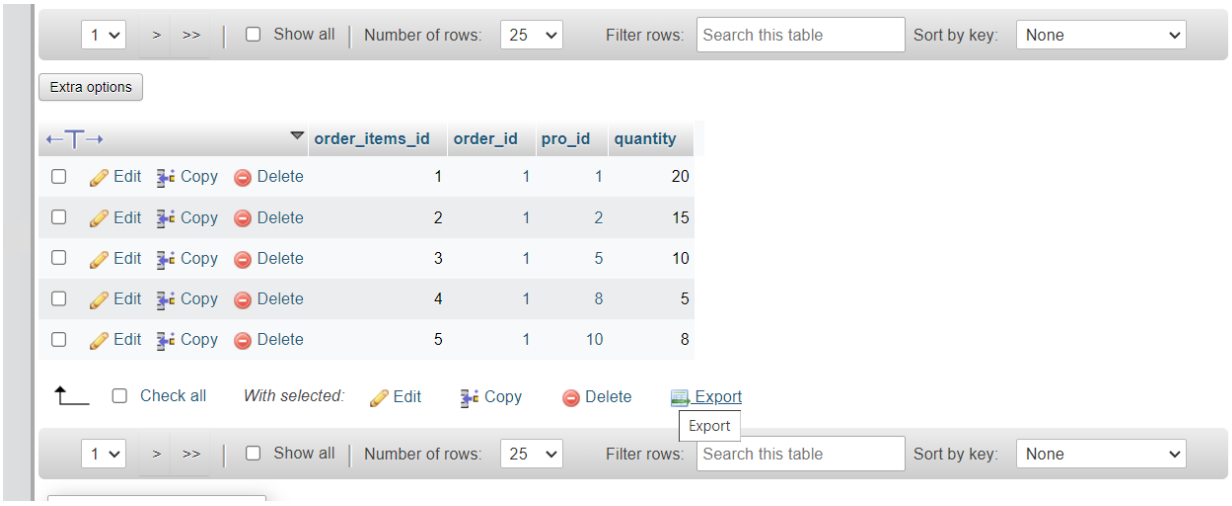


Fig 3.2(e) : Order_items

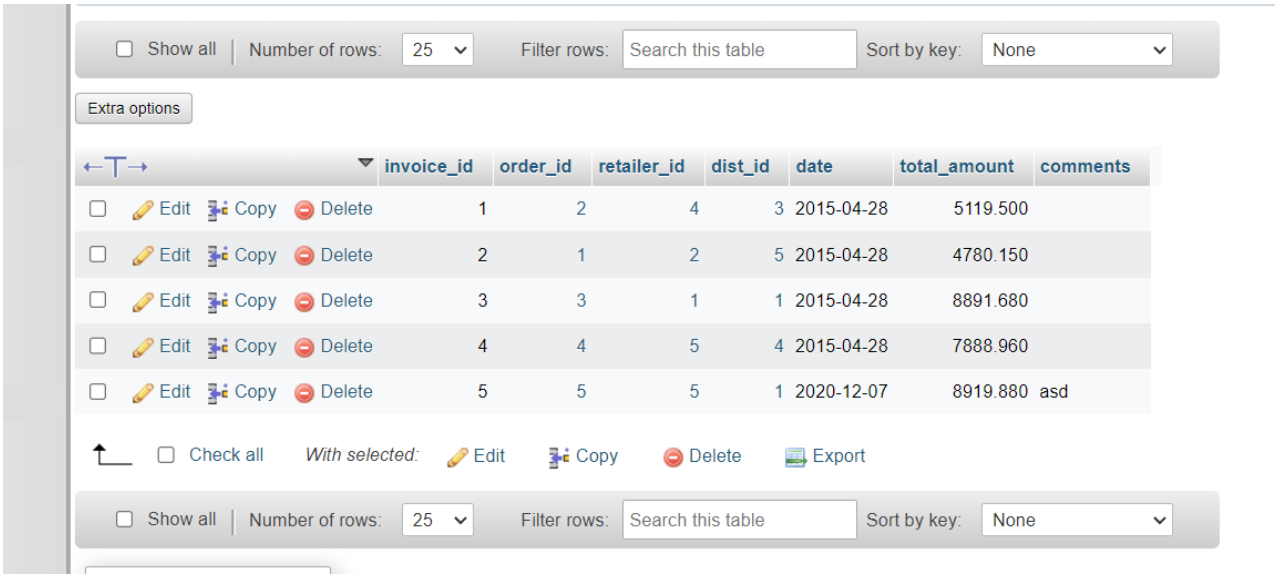


Fig 3.2(f) : Invoice

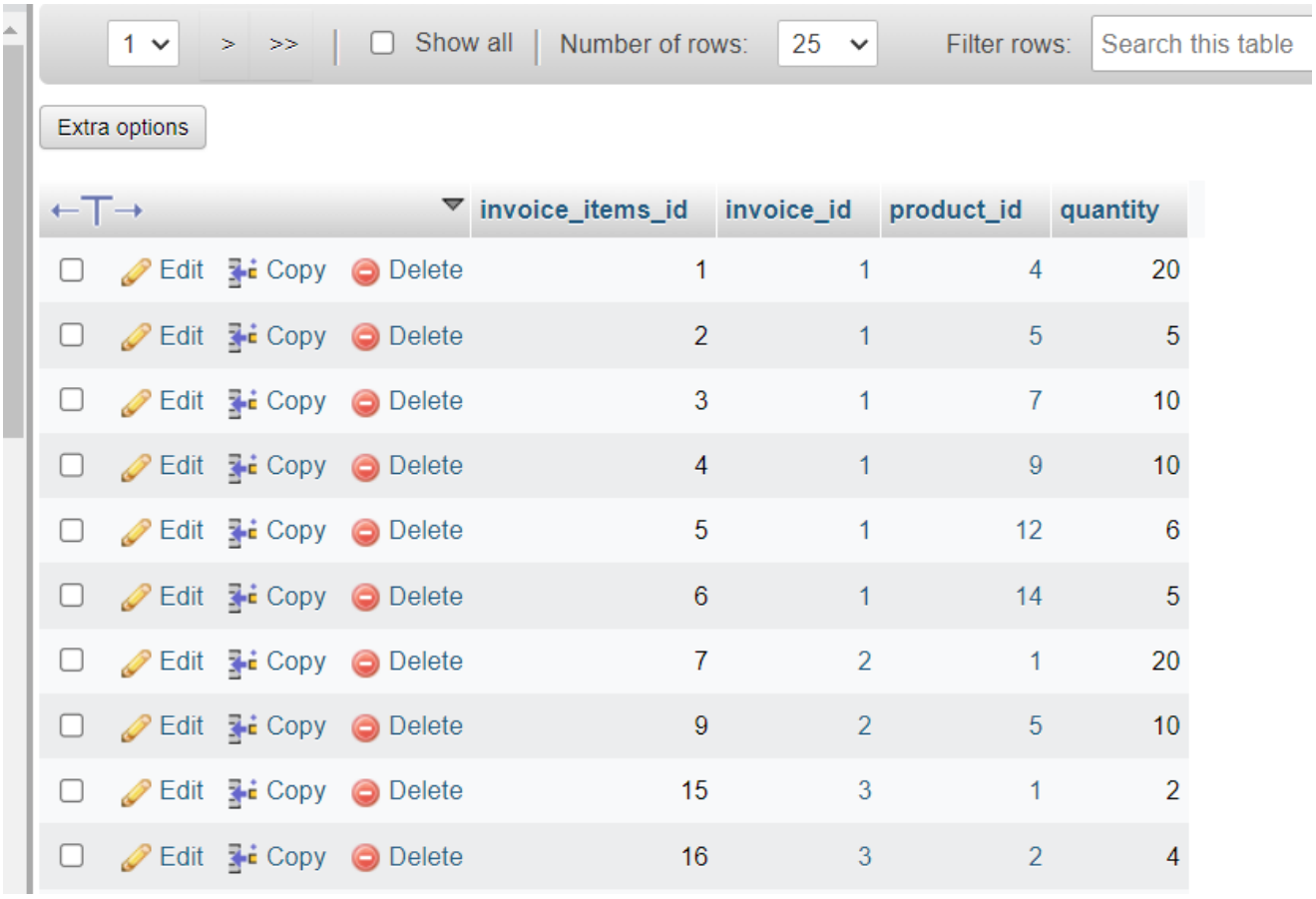
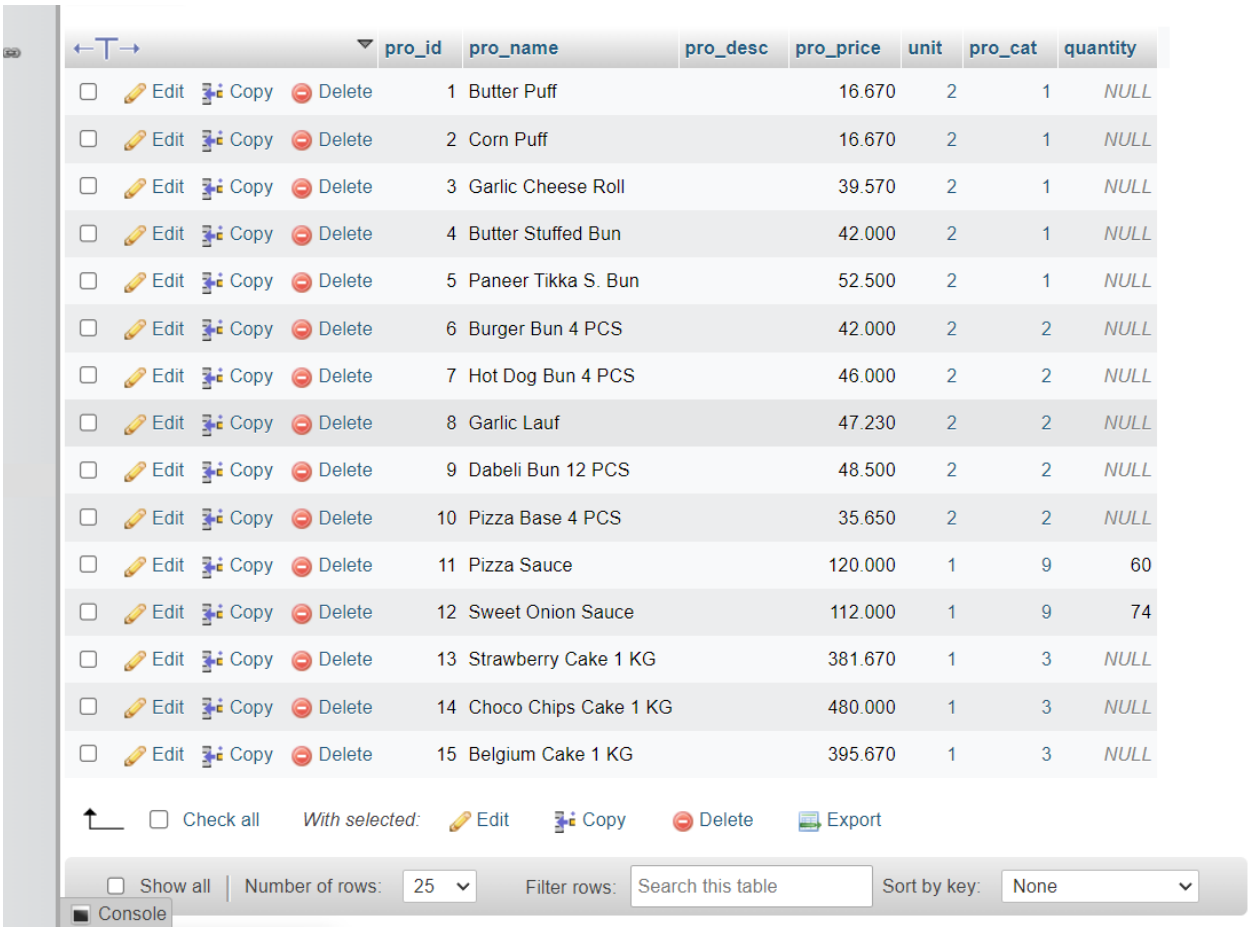


Fig 3.2(g) : Invoice_items



	pro_id	pro_name	pro_desc	pro_price	unit	pro_cat	quantity
Edit Copy Delete	1	Butter Puff		16.670	2	1	NULL
Edit Copy Delete	2	Corn Puff		16.670	2	1	NULL
Edit Copy Delete	3	Garlic Cheese Roll		39.570	2	1	NULL
Edit Copy Delete	4	Butter Stuffed Bun		42.000	2	1	NULL
Edit Copy Delete	5	Paneer Tikka S. Bun		52.500	2	1	NULL
Edit Copy Delete	6	Burger Bun 4 PCS		42.000	2	2	NULL
Edit Copy Delete	7	Hot Dog Bun 4 PCS		46.000	2	2	NULL
Edit Copy Delete	8	Garlic Lauf		47.230	2	2	NULL
Edit Copy Delete	9	Dabeli Bun 12 PCS		48.500	2	2	NULL
Edit Copy Delete	10	Pizza Base 4 PCS		35.650	2	2	NULL
Edit Copy Delete	11	Pizza Sauce		120.000	1	9	60
Edit Copy Delete	12	Sweet Onion Sauce		112.000	1	9	74
Edit Copy Delete	13	Strawberry Cake 1 KG		381.670	1	3	NULL
Edit Copy Delete	14	Choco Chips Cake 1 KG		480.000	1	3	NULL
Edit Copy Delete	15	Belgium Cake 1 KG		395.670	1	3	NULL

Check all *With selected:* Edit Copy Delete Export

Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

Console

Fig 3.2(h) : Product

CHAPTER 4

RESULT AND SNAPSHOT

4.1 Login page

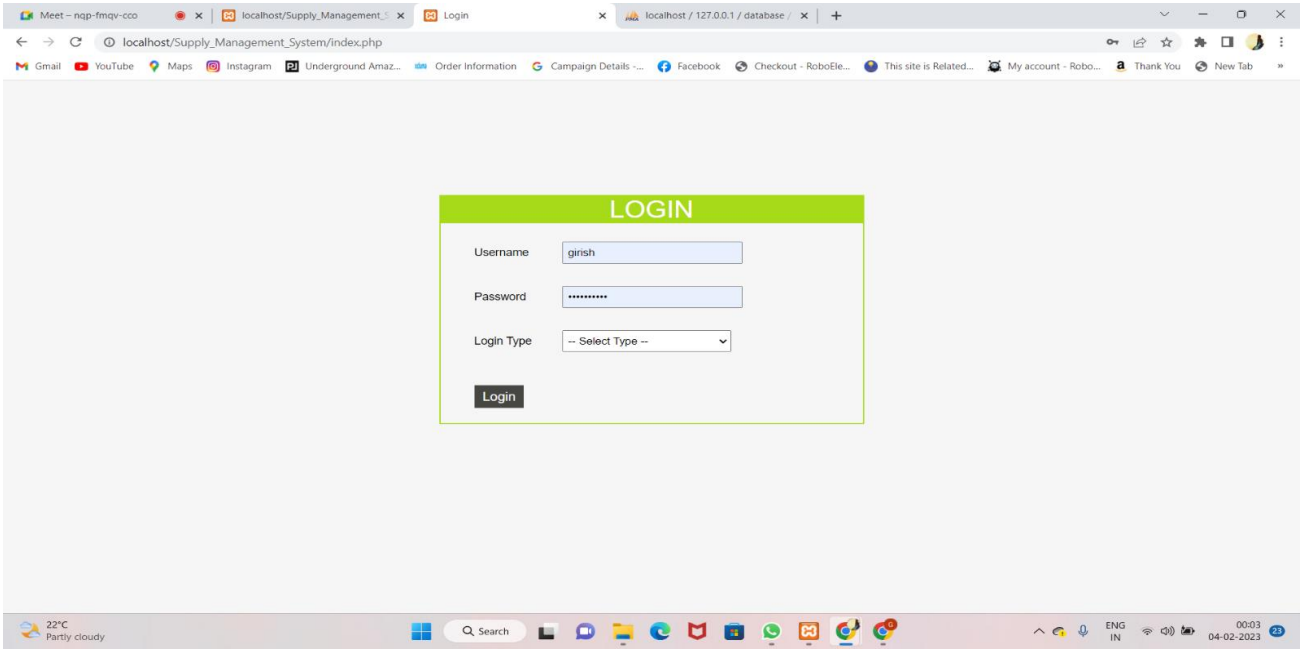


Fig 4.1 : login page

A login page serves as the entry point for users to access a secure platform, allowing them to access resources and perform specific tasks based on their role and privileges. The types of users who access a login page can include administrators, manufacturers, and retailers, each with varying levels of access and responsibilities within the platform.
There are mainly 3 types of login :

- Admin.
- Manufacturer
- Retailer

4.2 Manufacturer:

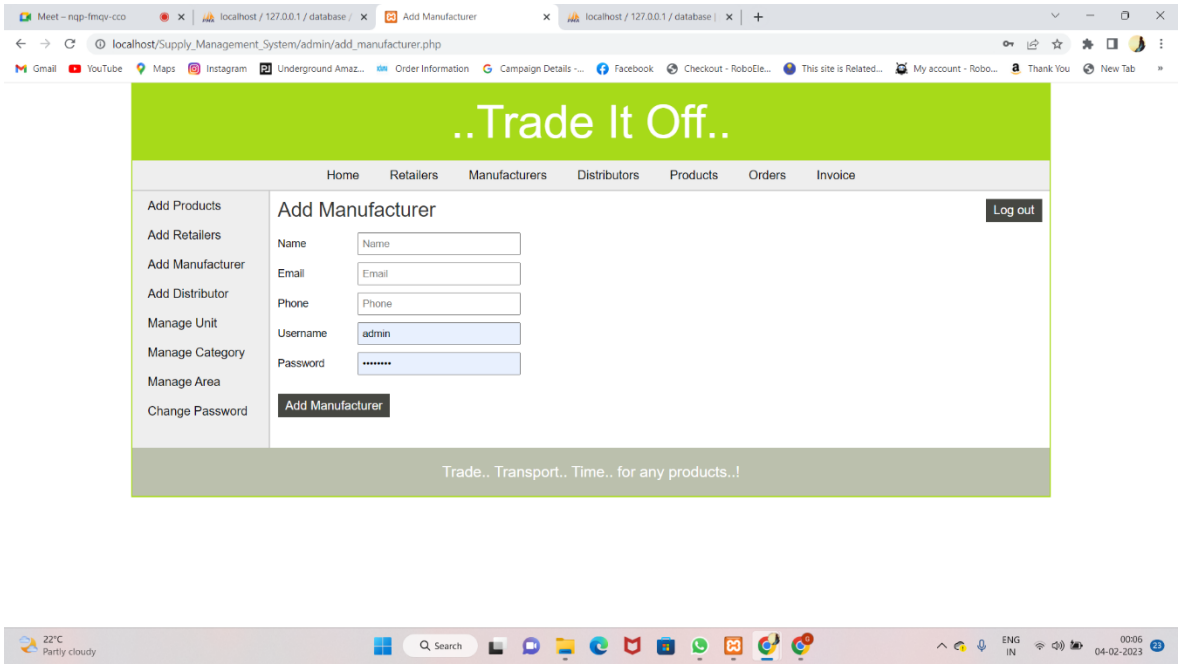


Fig 4.2(a) : Add manufacturer

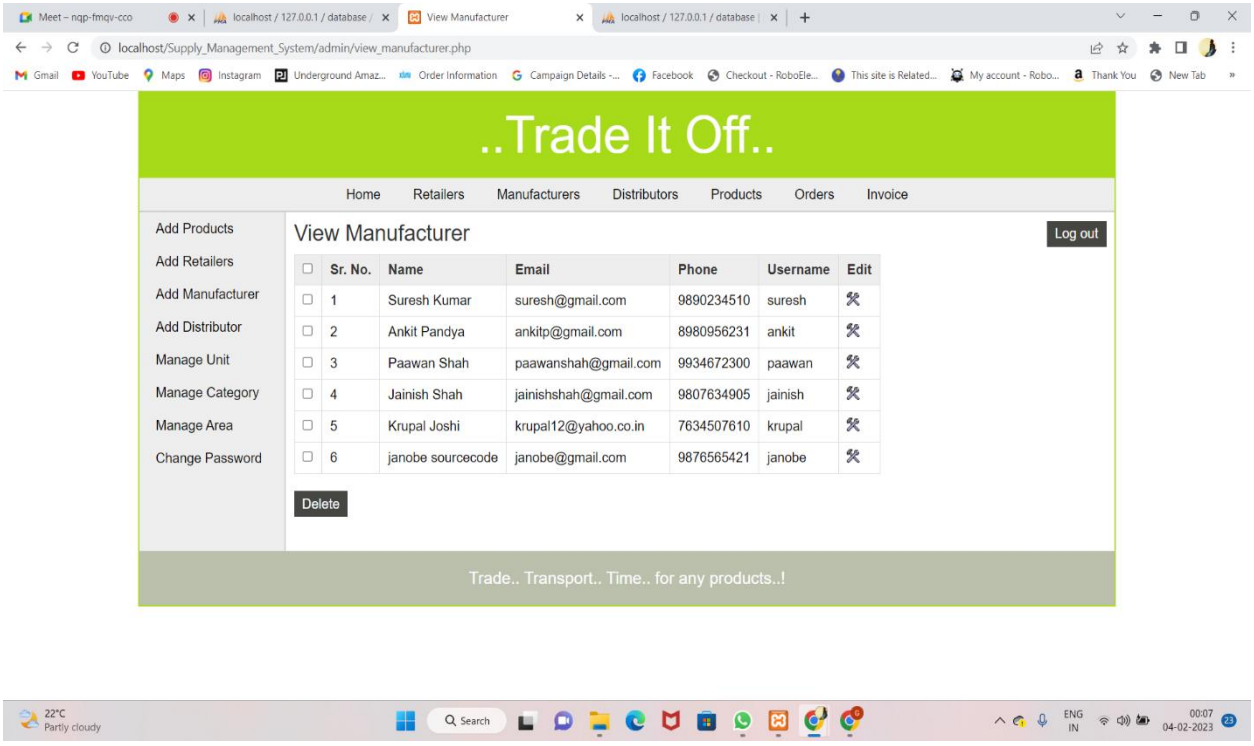


Fig 4.2(b) : View of manufacturer

Manufacturers refer to direct orders placed by customers with the manufacturer for goods or services. This type of ordering streamlines the supply chain and allows for more effective production planning and inventory management by the manufacturer.

4.3 Retailer

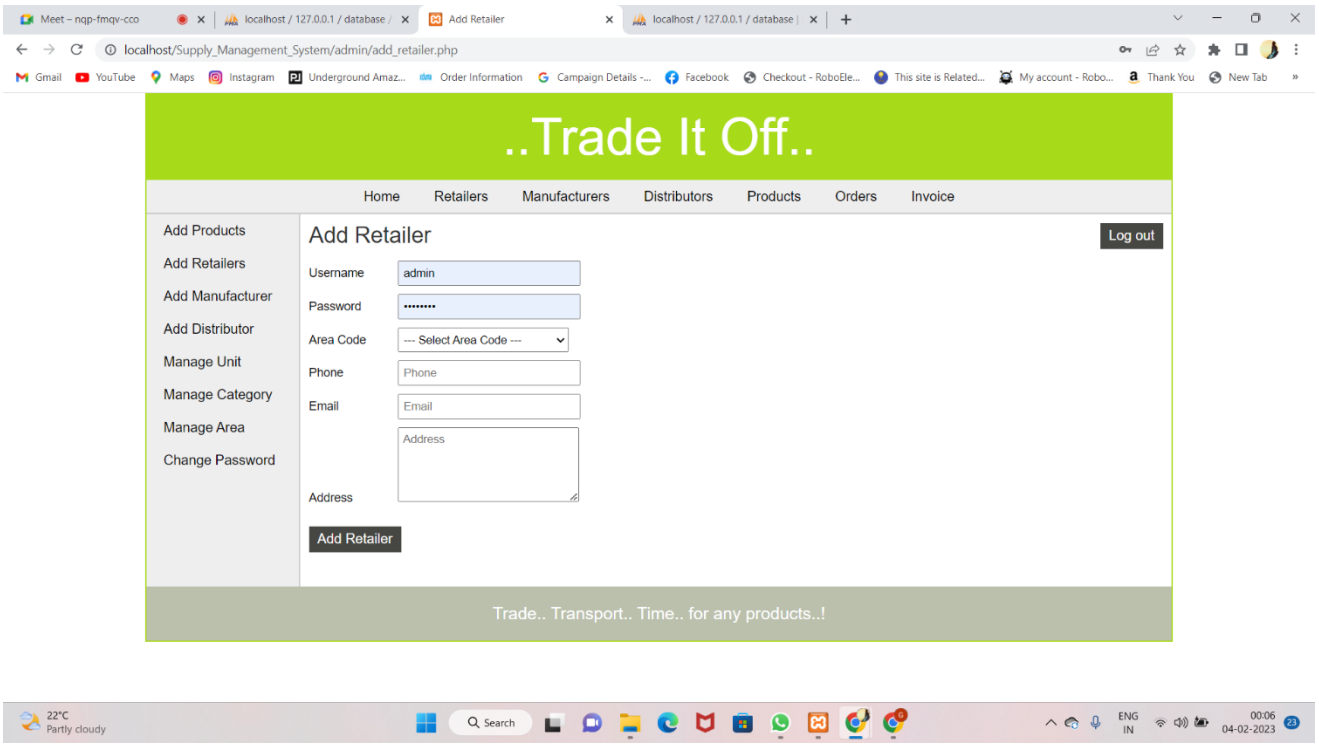


Fig 4.3(a) : Add retailer

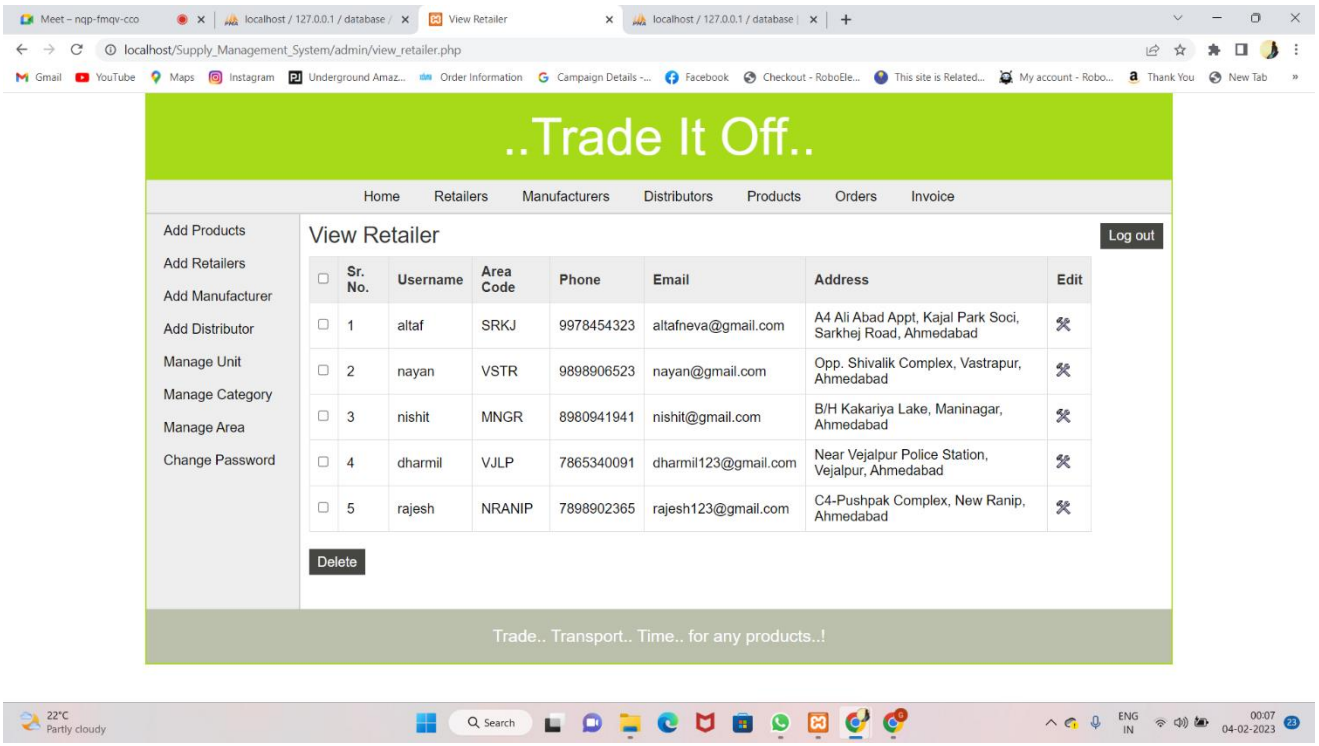


Fig 4.3(b) : View retailer

Retailer orders refer to purchases made by customers from retail stores. Retailers manage these orders by forecasting demand, controlling inventory levels, and coordinating with suppliers to provide timely fulfillment to customers.

4.4 Distributor

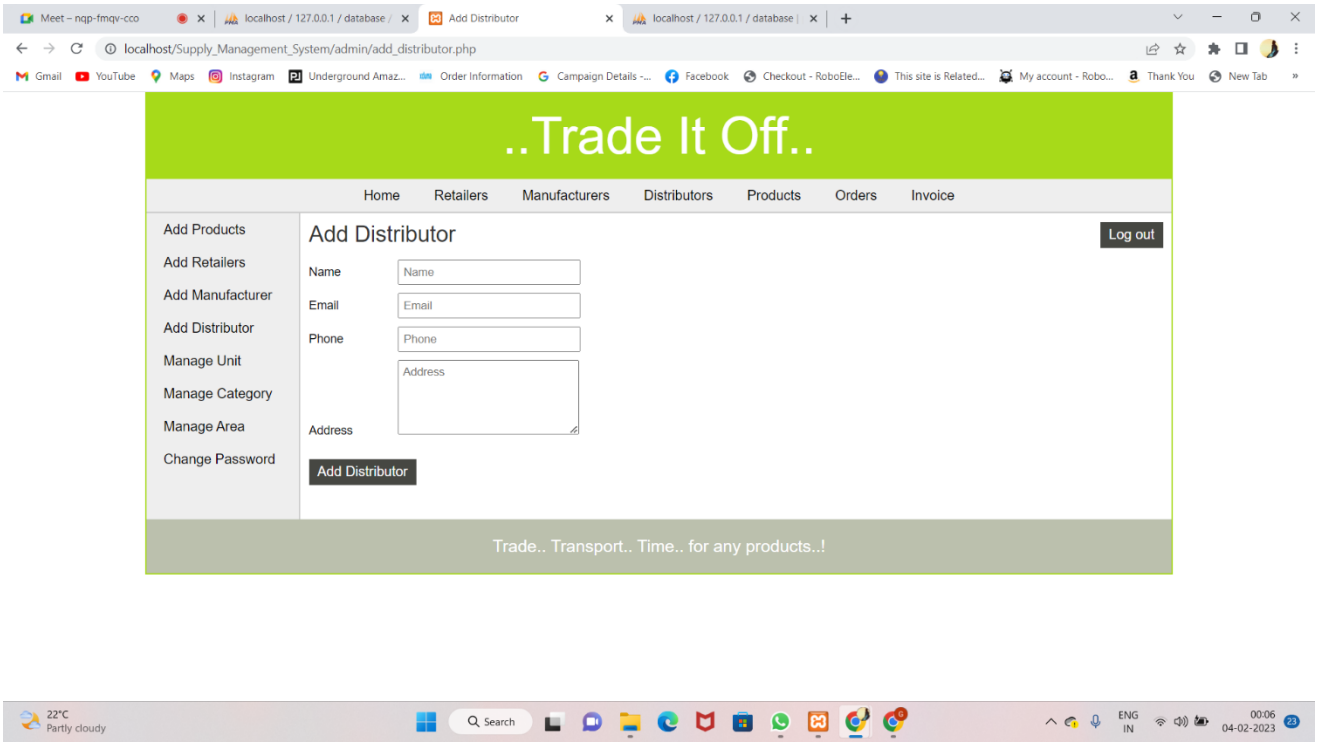


Fig 4.4(a) : Add distributor

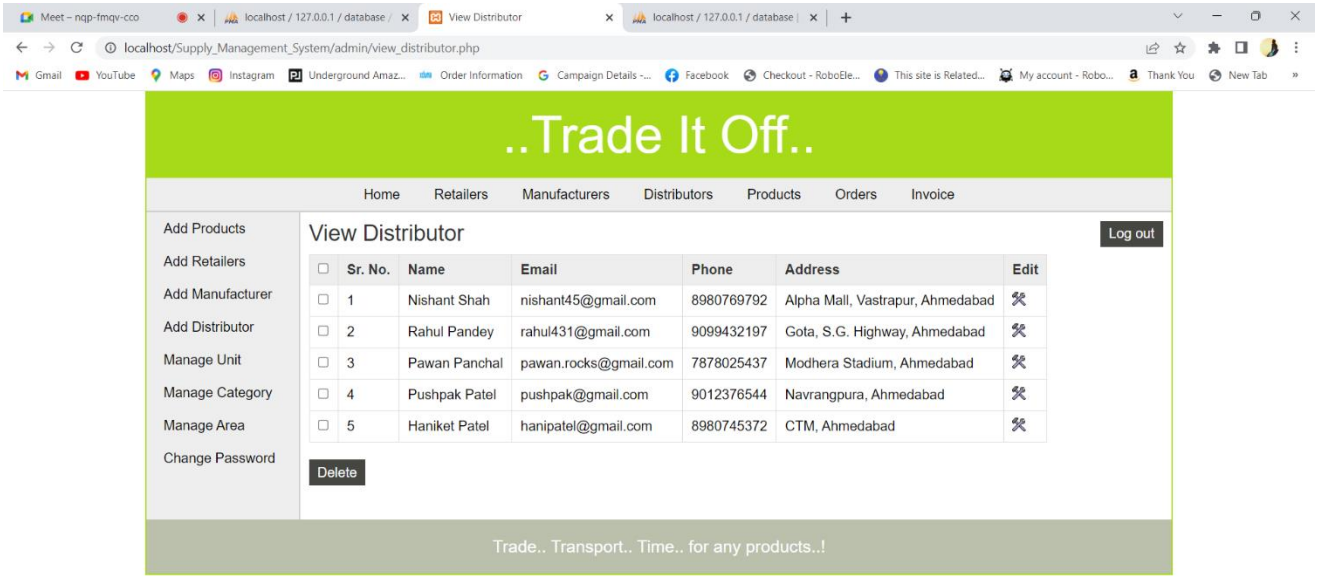


Fig 4.4(b) : View distributor

Distributor orders are requests made by customers through a distributor for goods or services. Distributors manage these orders by forecasting demand, controlling inventory, and coordinating with suppliers to ensure timely and accurate fulfillment to customers.

4.5 Order

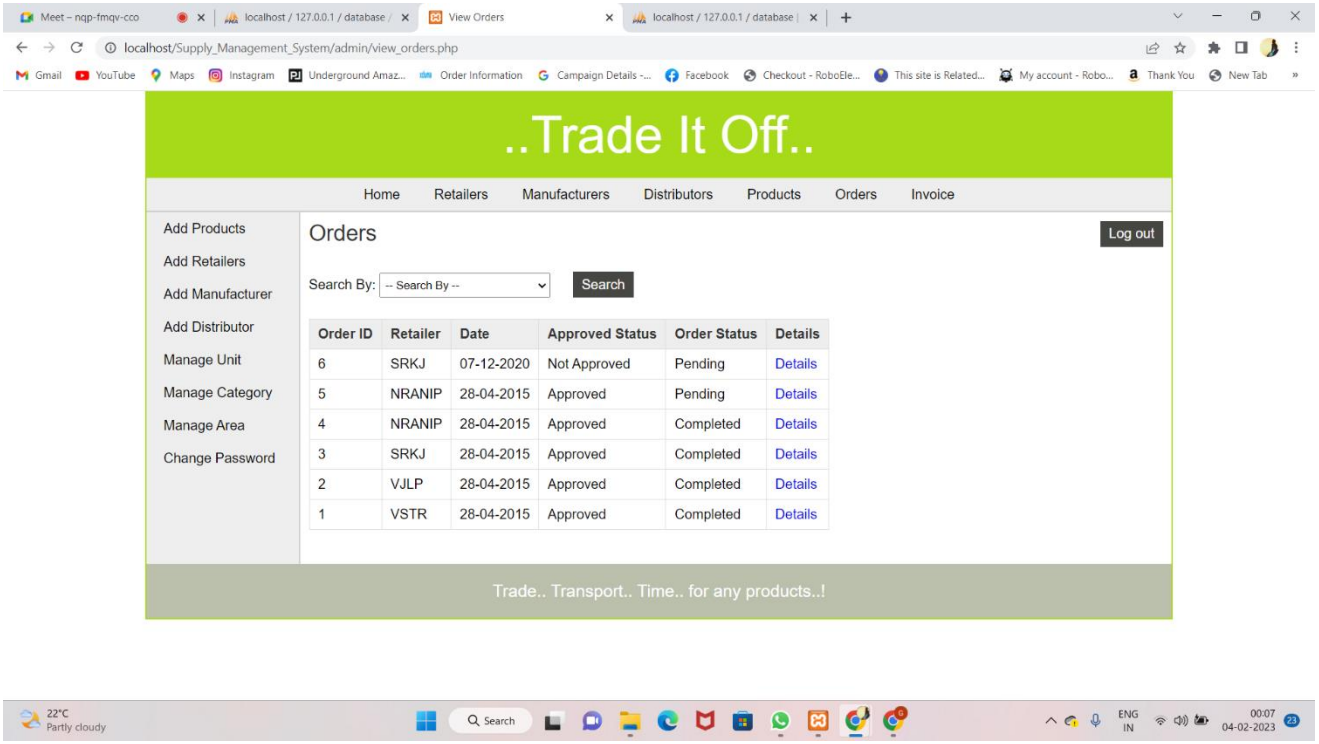


Fig 4.5(a) : Orders

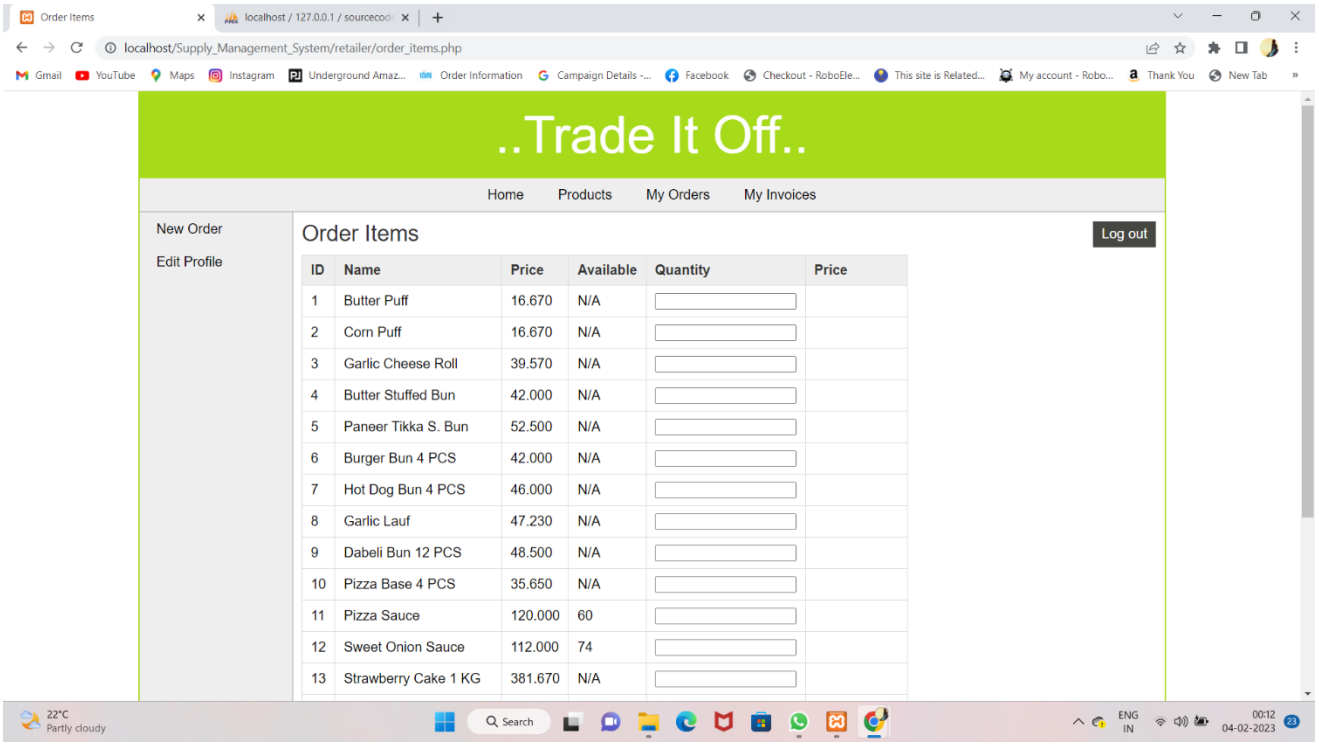


Fig 4.5(b) : Order Items

Orders in supply chain management refer to the request made by a customer for a specific product or service. They serve as a formal commitment to purchase and initiate the process of production, procurement, and delivery of the requested item. Effective order management ensures timely fulfillment, accurate inventory tracking, and smooth operations throughout the supply chain.

4.6 Product

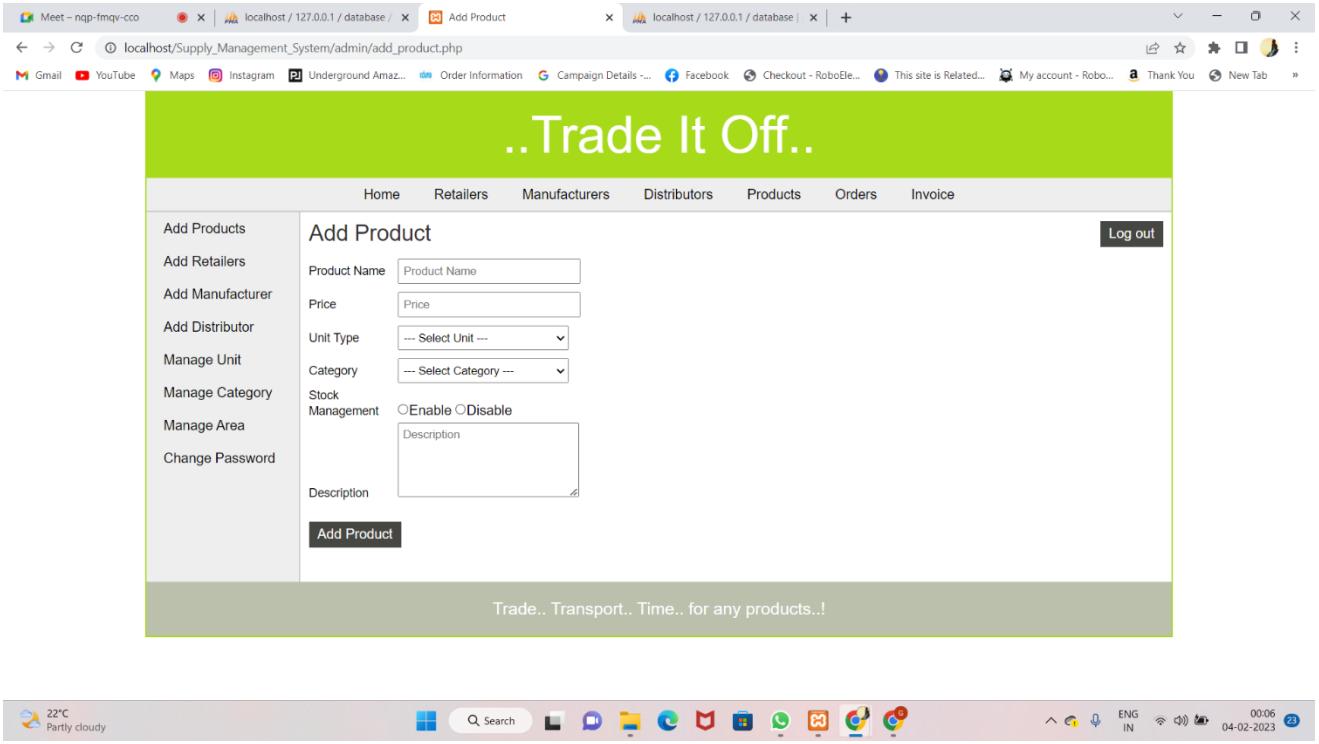


Fig 4.6 : Add Product

Product orders are requests for specific goods or items in the supply chain. Effective management of these orders involves accurate demand forecasting, efficient procurement, and timely delivery to ensure customer satisfaction and maintain smooth operations.

4.7 Invoice

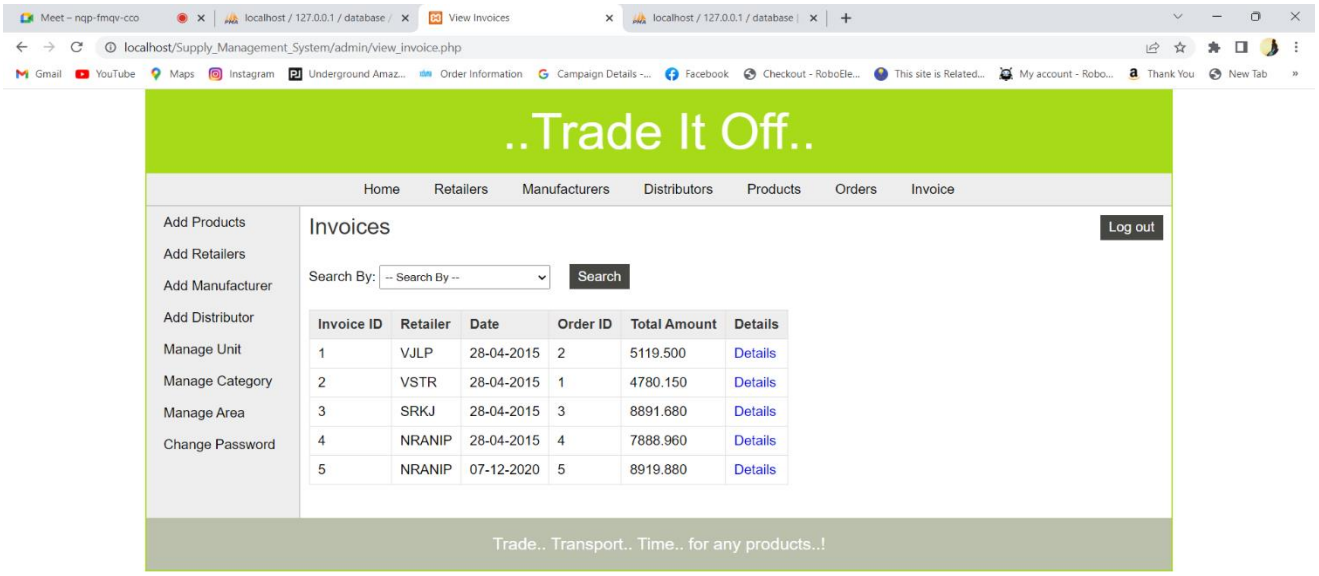


Fig 4.7 : Invoice

An invoice in supply chain management is a request for payment from a seller to a buyer for goods or services provided. It serves as proof of purchase and helps track the flow of funds in transactions, and effective management of invoices helps ensure timely payment and financial stability.

5. CONCLUSION

In conclusion, effective supply chain management is crucial for the success of any business in today's competitive market. The key findings of this project highlight the importance of having a streamlined and efficient supply chain system in place. This includes effective communication and collaboration between all parties involved, proper inventory management, and the use of technology to optimize processes. By addressing these critical aspects of supply chain management, companies can improve their overall performance, reduce costs, and increase customer satisfaction. Furthermore, the integration of sustainable practices into the supply chain can also help companies improve their environmental impact and contribute to a more responsible and sustainable future.

6. REFERENCES

JAVA DATABASE CONNECTIVITY:

"https://www.javapoint.com/java-jdbc"

"https://www.udemy.com/course/how-to-connect-java-jdbc-to-mysql/"

TEXTBOOK:

Database management system by ramakrishnan. Fundamentals of database system by Ramez Elmarsi, Navathe.

MYSQL:

https://www.w3schools.com/sql/sql_syntax.asp

https://www.apachefriends.org/download.html

HTML:

1. http://docs.oracle.com/cd/B19306_01/server.102/b1420O/toc.html.
2. http://databases_about.com/od/reviews/tp/sqlbooks.html.
3. https://projectsgeek.com/references/about/titles/mini-project.html.

FRONT END:

1. JS(Java Script)
2. PHP (Hypertext Preprocessor)
3. HTML

SAMPLE CODE REFERENCES

1. http://www.w3schools.com/howto/howto_css_login_form.asp
2. http://www.roseindia.com/css/css3_button.asp
3. http://www.stackoverflow.com/tags/javascript/info
4. http://wikipedia.com/wiki/JSP

PHP REFERENCES:

1. https://www.w3schools.com>php.
2. https://geeksforgeeks.org>php.
3. https://stackoverflow.com>php.
4. https://developer.wordpress.org>php.
5. https://www.php.net>manual>explained_codes_connections.

COURSES:

1. https://cognitiveclass.ai/courses/course-v1:IBM+GPXX0XFQEN+v1
2. https://cognitiveclass.ai/courses/course-v1:IBM+GPXX0MIIEN+v1
3. https://cognitiveclass.ai/courses/course-v1:IBM+GPXX0NHZEN+v1
4. https://cognitiveclass.ai/courses/learn-sql-relational-databases