LAU
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*Department of Computer Science & Mathematics*

# Requirements Document for Supply Chain Management System (SCMS)

## CSC 490: Software Engineering

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# Table of Contents

# Introduction:

In today's modernistic world, reliable and efficient supply chain management has become an integral business component. Businesses need to optimize their supply chains to save costs, enhance efficiency, and boost customer satisfaction due to the market's growing complexity and competitiveness. However, managing a supply chain can be challenging due to its complexity and the involvement of multiple stakeholders. Businesses need a complete Supply Chain Management System (SCMS) that can manage and coordinate all of the supply chain's activities, from the acquisition of raw materials through the shipment of completed goods to clients, to handle these difficulties. The SCMS is a cloud-based system that helps businesses manage their supply chain operations.

The main objectives of the SCMS are to:

1. Streamline supply chain operations: The SCMS will assist companies in streamlining their supply chain processes, lowering lead times, reducing stock-outs, and increasing order fulfillment rates.
2. Enhance collaboration and communication: Suppliers, manufacturers, distributors, and consumers will all benefit from improved communication and cooperation.
3. Improve inventory management: Businesses will be able to manage their inventory more effectively, lower carrying costs, and avoid stock-outs due to the SCMS's real-time visibility into inventory levels.
4. Optimize logistics and transportation: Businesses will be able to optimize their logistics and transportation processes, save transportation costs, and speed up delivery times.

Budgetary restraints, technological limitations, and legal requirements are only a few of the restrictions that may be necessary for the SCMS's implementation. While ensuring that it satisfies the needs of the business, the system must be developed in a practical way. Furthermore, the system needs to abide by pertinent laws and standards, including those governing data privacy. Despite various limitations, the SCMS's successful adoption will give companies a competitive edge in the market by cutting costs, boosting efficiency, and raising customer satisfaction.

# Glossary:

- Definitions:
    - Supply Chain: The network of all individuals, organizations, resources, activities, and technology involved in the creation and sale of a product, from the delivery of source materials to the manufacturer to the delivery of the finished product to the end user.
    - Stock Keeping Unit (SKU): a unique identifier assigned to each distinct product or item in a company's inventory. The SKU is used to track inventory levels, sales, and other important data related to the product. It is often a combination of letters and numbers that help distinguish the product from others in the inventory.
    - Inventory Management: The process of managing the flow of goods and materials into and out of a company's stock, including overseeing purchasing, storage, tracking, and sales.
    - Logistics: The process of planning, implementing, and controlling the efficient and effective movement and storage of goods and materials from the point of origin to the point of consumption.
    - Procurement: The process of finding, acquiring, and purchasing goods, services, or works from an external source, often via a tendering or competitive bidding process.
    - Supplier: A company or individual that provides goods or services to another company or individual.
    - Inventory Management System (IMS): A software application designed to support and optimize warehouse functionality and distribution center management, including inventory tracking and management, order processing, and shipping.
    - Order Management System (OMS): A software application that manages the entire order lifecycle, including order entry, inventory management, order fulfillment, shipping, and customer service.
    - Supply Chain Management System (SCMS): A software application designed to manage the flow of goods and materials, as well as the information related to those goods and materials, throughout the supply chain.

- Symbolism:
    - (D) → Domain Requirement
    - (F) → Functional Requirement
    - (NF) → NonFunctional Requirement

# Background:

The supply chain industry is a complex and critical part of the global economy, involving the movement of goods and materials from suppliers to manufacturers to distributors and ultimately to end customers. A well-managed supply chain can improve efficiency, reduce costs, and increase customer satisfaction, while a poorly managed one can lead to delays, excess inventory, stockouts, and lost sales.

To address these challenges, many companies are turning to supply chain management systems (SCMS) to help them manage and optimize their supply chain operations. SCMS can help companies track inventory levels, monitor supplier performance, manage transportation and logistics, and analyze supply chain data to identify areas for improvement. However, not all SCMS are created equal, and companies must carefully evaluate their options to ensure they select a system that meets their specific needs. Factors such as ease of use, scalability, and integration with existing systems are critical considerations. Furthermore, the COVID-19 pandemic has highlighted the importance of supply chain resilience and the need for companies to be able to quickly adapt to disruptions and changes in demand. As a result, supply chain management systems that can provide real-time visibility and agile decision-making capabilities are becoming increasingly important for companies of all sizes and industries.

Our team has identified the need for a supply chain management system that is tailored to the needs of small and medium-sized businesses. By leveraging the latest technology and best practices in supply chain management, we aim to develop a system that is affordable, easy to use, and provides the functionality needed to optimize supply chain operations and improve business outcomes in real time. Our supply chain management system addresses the challenges of trust and

reliability through several measures. Firstly, we offer end-to-end visibility into the supply process, providing a clear view of inventory levels, order status, and logistics. Additionally, we have implemented a rating system for each supplier, allowing users to make informed decisions based on the supplier's track record. Furthermore, we moderate our suppliers carefully to ensure that only trusted and reliable entities can become part of our community, thereby providing an added layer of security and peace of mind for our users.

# User Requirements:

## Introduction to User Requirements:

This section outlines the functional and non-functional requirements of the Supply Chain Management System. The purpose of these requirements is to ensure that the system meets the needs of its users and effectively manages the supply chain process.

## Functional Requirements:

### User Registration:

Source: Discussion with Client

The system should provide the ability for users (customers and moderators) to create a secure account and log in to access the SCMS. (D)

- Users should be able to create an account by providing their name, email address, and a secure password (moderators need to be verified). (D)
- The system should validate the user's email address and password to ensure that they meet the security requirements.
- Users should be able to log in securely to the SCMS using their email address and password.
- The system should store the user's account information securely and allow them to update it as necessary.
- Users should be able to reset their password in case they forget it or suspect that it has been compromised.

- The system should have appropriate measures in place to protect user account information and prevent unauthorized access.

## Inventory Management:

Source: Discussion with the inventory management team
The system should allow the user to view and manage the inventory levels of all products stored in the warehouse. (D)

- Add, edit, and delete product information (name, description, category, quantity, etc.) (D)
- View inventory levels in real-time.
- Receive notifications when inventory levels are low.
- Generate reports on inventory levels, demand, and sales.

## Order Processing (D):

Source: Discussion with Client
The system should enable the user to process orders from customers, and monitor the progress of each order. The following functionalities should be available:

- Add, edit, and delete customer information (name, address, contact details, etc.)
- Create and manage orders (select products, quantity, delivery address, etc.)
- Monitor the status of each order (processing, shipped, delivered, etc.)
- Generate reports on sales, revenue, and customer orders.

## Supplier Registration:

Source: Discussion with Client
The system shall provide a supplier registration functionality to allow new suppliers to sign up and be added to the system.

- The registration process will include providing the supplier's name, contact details, business information, and other relevant information required for managing suppliers.

- Suppliers must agree to the terms and conditions of the system before registering.
- The system will verify supplier information to ensure accuracy and prevent fraudulent activity.
- The system will assign a unique identifier to each supplier for tracking and identification purposes.
- The system shall allow administrators to review and approve new supplier registrations before they are added to the system.
- The system shall allow users to view and search for registered suppliers by name, product, or other relevant criteria.
- Allow suppliers to input and update their information.
- Provide suppliers with access to their account and order history.
- Enable suppliers to track their performance metrics.

## Supplier Management:

Source: Discussion with Client
The system should enable the user to manage suppliers, their products, and their performance.

- Add, edit, and delete supplier information (name, address, contact details, etc.)
- View and manage supplier product information (name, description, category, quantity, price, etc.)
- Monitor supplier performance (delivery times, quality of products, etc.)
- Generate reports on supplier performance and costs.
- Enable customers to provide feedback and ratings on their experience with the suppliers with the ability to report abusive suppliers.

## Supplier Product Catalog Management:

Source: Discussion with the client

- The system should provide the ability for suppliers to manage their product catalog, allowing them to add, edit, and delete product information.

- Suppliers should be able to provide product details such as product name, description, price, SKU, and images.
- The system should allow suppliers to categorize their products for easy navigation and searchability.
- Suppliers should be able to specify product availability and lead time for delivery.
- The system should validate the product information provided by the suppliers to ensure accuracy and prevent fraudulent activity.
- The system should allow administrators to review and approve new product information before it is added to the system.
- Suppliers should be able to track their product performance metrics, such as sales, demand, and customer feedback.

## Reporting and Analytics:

Source: Discussion with Client

The system should provide a comprehensive reporting and analytics module that enables users to make informed decisions.

- The system must provide a dashboard to view key performance indicators (KPIs) such as inventory turnover, order fulfillment rates, and delivery times.
- The system must allow users to generate reports on demand or schedule them to be generated and sent automatically.
- The system must allow users to customize the reports to include only the relevant data and visualizations.
- The system should allow the users to track the performance of the supply chain management system in real-time.
- The users should be able to set up alerts to be notified when specific KPIs fall below or exceed a certain threshold.
- The system should provide the users with a real-time view of the inventory levels, order processing status, and supplier performance.

## Ease of Use:

Source: Discussion with Client
The system should be designed with a user-friendly interface and intuitive navigation to facilitate ease of use for all users.

- The system should have clear and concise labeling for all buttons, fields, and menu options to minimize confusion.
- The system should have a consistent layout and design throughout all pages to improve familiarity and reduce cognitive load.
- The system should minimize the number of steps required to complete common tasks to improve efficiency and user satisfaction.
- The system should provide contextual help and guidance, including tooltips and instructional pop-ups, to assist users in performing tasks and understanding system functionality.
- The system should have customer support details shown at the bottom of the UI.

## Non-functional Requirements:

## Performance:

The system should be able to handle a large number of concurrent users and transactions without any significant slowdowns. The following performance metrics should be achieved:

- The system should be able to respond to user requests within 5 seconds or less.
- The system should be able to handle up to 10,000 concurrent users.
- The system should be able to process up to 10,000 orders per hour.

## Reliability:

The system should be highly reliable and available at all times.

- The system should have an uptime of 99.99% or higher.
- The system should be able to recover from hardware or software failures within 1 hour or less.

## Software and Hardware Constraints:

- The system should be optimal for desktop web browsers as well as mobile devices since both would be used by different user bases. It is best to utilize the newest versions of google chrome, Firefox, Microsoft edge, and Safari.
- Modern computers using Windows operating system (windows 8 till 11), macOS/macOS(Mojave, High Sierra, Sierra, El Capitan, Yosemite…etc.…)or Linux(Mint 21.1). For mobile phones: IOS 11 and beyond for Apple iPhone, version 10+ for android devices.
- The system should be developed in HTML, CSS, JavaScript, and PHP.
- The system should use MongoDB database for the storage of information.

# System Requirements:

## Nonfunctional and Functional Requirements:

### User Registration:

Source: Discussion with Engineering team

1. Signing in: The system should provide a framework which lets the user sign into the website:
    a. The system would save all written usernames, passwords, and emails into its database by way of writing and a save button (D).
    b. Once the user registers their basic info, an email is sent to their registered email demanding confirmation of the account, aka two-factor authentication (D).
    c. CAPTCHA is used to identify if the user is real or a bot.
    d. Once the confirmation is made, the user is saved into the system and has the option to log in and out whenever they please.
    e. The option of modification and deletion is available, meaning that the system should delete any registered information about the user if the user chooses to delete their account, or the system may modify said information if the user chooses to do so (D).

f. Support for any forgotten piece of information will be given through a "forgot my password/username" section where the system will send an email to the user and give the option to change the information.

2. Roles: Users can register to roles giving them access to certain services and permissions from the system:
    a. Admin/Moderator role: The system provides all permissions that permit the admin to do their job. It permits them to track all accounts found in the database and gives them the option of changing any dataset of said database as they please provided the system remains consistent and the admin in question works for the SCMS company itself. The moderator role provides the same permissions for the moderator but at a smaller scale.
    b. Supplier role: The system provides the supplier with all basic services that any other user gets but with the addition of special notifications for companies or normal users that need a certain product/supply that the supplier attached themselves with. (D)
    c. User roles: The system provides basic permissions to users through a database system. It may recommend high demand products as well as those that are of reasonable price through a recommendation system, additionally basic searching services are provided.

## Searching:

Source: Discussion with client

1. The system should give the ability to users to search for suppliers or components/parts:
    a. Keyword/name of company
        i. The user accesses a search bar and inputs the company name that they want to find, or a keyword item which they are interested in. The query input is checked against the database, and will look initially for a company name or product, but can also expand the domain of the query by selectors in a **Filter by** section located on the search bar as a collapsible, and will be discussed in the next bullet point. (D)

b. Filter by(optional):
    i. Highest rating to lowest: adds to the query a selector to call MAX(Rating) function along the query.
    EXAMPLE: SELECT NAME FROM COMPANY WHERE RATING=MAX(RATING);
    ii. Region: if selected it is also required to select a country. It narrows down the query to a certain region/area where the company is located.
    EXAMPLE: SELECT NAME FROM COMPANY WHERE REGION=input AND COUNTRY=input;
    iii. Country: adds to the query and also searches based on the country of the company.
    EXAMPLE: SELECT NAME FROM COMPANY WHERE COUNTRY=input; (D)

## Database Management System (F):

Source: Discussion with development team

1. Database design: The system shall include a well-designed database that can efficiently store and retrieve inventory data. The database schema should be flexible and scalable to accommodate future changes and additions to the system. (D)
2. Data integrity: The system shall implement data integrity measures to ensure that inventory data is accurate and consistent. This includes the use of data validation checks, constraints, and referential integrity. (D)
3. Performance: The database should be optimized for fast data retrieval and processing, with appropriate indexing and query optimization techniques employed. This will help to ensure that inventory information can be accessed quickly and efficiently.
4. Backup and recovery: The system shall include robust backup and recovery mechanisms to protect against data loss or corruption. Regular backups should be taken, and recovery procedures should be well-documented and tested. (D)

## Inventory Management Tab:

Source: Discussion with customers and employees
The Inventory management tab should include the following:

1. Product management: The system shall provide a user-friendly interface to allow authorized users to add, edit, and delete product information such as name, description, category, quantity, and other related details. (D)
2. Inventory tracking: The system shall track inventory levels in real-time and provide up-to-date information on stock levels, including the quantity available, on-hand, reserved, and on-order. (D)
3. Low inventory notifications: The system shall generate automatic notifications to authorized users when inventory levels fall below a predefined threshold. This will help ensure that inventory levels are always maintained at an appropriate level. (D)
4. Reporting: The system shall provide reporting capabilities to allow authorized users to generate reports on inventory levels, demand, and sales. These reports should be customizable and provide useful insights into inventory management and performance. (D)
5. User roles and permissions: The system shall support user roles and permissions to ensure that only authorized users can access and manage inventory data. Different user roles may have different levels of access and permissions, depending on their responsibilities within the organization.
6. Audit trail: The system shall maintain an audit trail of all inventory-related activities, including changes to inventory levels, product information, and user activity. This will help to ensure accountability and provide a history of inventory management activities.

## Reporting and Analytics Tab:

Source: Discussion with developing team
The Reporting and Analytics tab shall enable the user to perform the following actions:

1. View key performance indicators (KPIs) related to supply chain management, including inventory turnover, order fulfillment rates, delivery times, and other relevant metrics. (D)

2. Generate reports on demand or schedule them to be generated and sent automatically, with the ability to customize the reports to include only the relevant data and visualizations. (D)
3. Provide a real-time view of the inventory levels, order processing status, and supplier performance, allowing the user to monitor the performance of the supply chain management system in real-time. (D)
4. Enable users to set up alerts to be notified when specific KPIs fall below or exceed a certain threshold, ensuring that the user can take appropriate action to address any issues or opportunities.

## Supply Management Tab:

Source: Discussion with Engineering team

The Supplier Management tab shall allow the user to perform the following actions:

1. Add, edit, and delete supplier information, including name, address, contact details, and other relevant information. (D)
2. View and manage supplier product information, including name, description, category, quantity, price, and other relevant information. (D)
3. Monitor supplier performance metrics, such as delivery times, quality of products, and other relevant factors.
4. Generate reports on supplier performance, costs, and other key metrics to support decision-making and performance monitoring.
5. Enable customers to provide feedback and ratings on their experience with the suppliers, with the ability to report abusive suppliers.
6. Provide a secure and reliable database to store and manage all supplier-related data and information.

## Supplier Product Catalog Management Tab:

Source: Discussion with supplier

1. The system shall provide a supplier portal for managing product catalog. (D)
2. The system shall allow suppliers to add and remove products to the catalog. (D)
3. The system shall allow suppliers to edit and update existing product information in the catalog. (D)
4. The system shall allow suppliers to categorize their products for easy navigation and searchability.
5. The system shall allow suppliers to specify product availability and lead time for delivery.
6. The system shall validate the product information provided by the suppliers to ensure accuracy and prevent fraudulent activity.
7. The system shall allow administrators to review and approve new product information before it is added to the catalog.
8. The system shall allow suppliers to track their product performance metrics, such as sales, demand, and customer feedback.
9. The system shall provide reporting and analytics tools for suppliers to make informed decisions about their product offerings.

## Order Processing Tab:

Source: Discussion with Client

1. Customer management: The system shall provide a user-friendly interface to allow authorized users to add, edit, and delete customer information such as name, address, contact details, and other related details. (D)
2. Order creation and management: The system shall allow authorized users to create and manage orders, including selecting products, specifying quantity, providing delivery address, and other relevant details.
3. Order tracking: The system shall enable authorized users to monitor the status of each order, from processing to shipment and delivery.
4. Reporting: The system shall provide reporting capabilities to allow authorized users to generate reports on sales, revenue, and customer orders.

These reports should be customizable and provide useful insights into order processing and performance.

5. User roles and permissions: The system shall support user roles and permissions to ensure that only authorized users can access and manage order data. Different user roles may have different levels of access and permissions, depending on their responsibilities within the organization.
6. Audit trail: The system shall maintain an audit trail of all order-related activities, including changes to customer information, order creation, and order status updates. This will help to ensure accountability and provide a history of order processing activities.

## Security:

Source: Discussion with Engineering team

The system should maintain a high level of security to protect user and company data from unauthorized access, alteration, or destruction.

1. The system should use encryption technology like Advanced Encryption Standard (AES) 256 and HTTPS protocol to protect all data in transit and at rest.(D)
2. The system should have multi-factor authentication to prevent unauthorized access.
3. The system should have role-based access control to ensure that users only have access to the data and functionalities necessary for their job.
4. The system should have audit logging to track all user activities and detect any suspicious behavior.
5. The system should have regular security assessments and penetration testing to identify and address vulnerabilities.
6. The system should comply with all relevant data privacy laws and regulations, such as GDPR or CCPA, to protect the privacy of user and company data.(D)

### Scalability:

Source: Discussion with Client
The system should be able to handle an increase in users and data without any significant performance degradation.

- The system should be able to scale horizontally by adding more servers to handle increased traffic.
- The system should be able to handle at least a 50% increase in users and data without any significant performance degradation.

### Compatibility:

Source: Discussion with Engineering team
The system should be compatible with the latest web browsers and operating systems.

- The system should be compatible with the latest version of Google Chrome, Mozilla Firefox, and Microsoft Edge.
- The system should be compatible with Windows and MacOS operating systems as well as mobile phones.

## Use Cases and Scenarios:

### Inventory Management:

- Updating Inventory Levels

  **Scenario:** The system should allow authorized personnel to update inventory levels in real-time. For example, when a new shipment of products arrives, the system should allow the warehouse staff to scan the products and update the inventory levels accordingly. If the system detects that the inventory levels have fallen below the minimum threshold, it should automatically trigger a purchase order to the supplier.

- Stock Replenishment

  **Scenario:** The system should generate a report on a daily basis that shows the current stock levels and the quantities that need to be replenished. Based on this report, the procurement team can create purchase orders and send them to the suppliers.

## Order Processing:

- Order Tracking

  **Scenario:** The system should allow customers to track their orders in real-time. When a customer places an order, the system should generate a unique order ID and send it to the customer via email or SMS. The customer should be able to use this order ID to track the status of their order, from processing to shipping to delivery.

- Order Fulfillment

  **Scenario:** The system should automatically process and fulfill orders based on the inventory levels and availability of products. If a product is out of stock, the system should automatically notify the customer and provide an estimated delivery date.

## Supplier Management:

- Supplier Onboarding

  **Scenario:** The system should allow authorized personnel to onboard new suppliers and manage their information, including contact details, product catalogs, pricing, and delivery schedules. The system should also allow the procurement team to evaluate the performance of each supplier based on key metrics such as lead time, quality, and cost.

- Purchase Order Management

  **Scenario:** The system should allow the procurement team to create and manage purchase orders for each supplier. The system should automatically

generate purchase orders based on the inventory levels and the supplier's delivery schedule. The system should also allow the procurement team to track the status of each purchase order, from creation to delivery.

## Reporting and Analytics:

- Dashboard View

  **Scenario:** The system should display a customizable dashboard view that provides an overview of key performance indicators (KPIs) such as inventory levels, order processing times, and delivery times. The user should be able to select and configure which KPIs are displayed on the dashboard and how they are visualized.

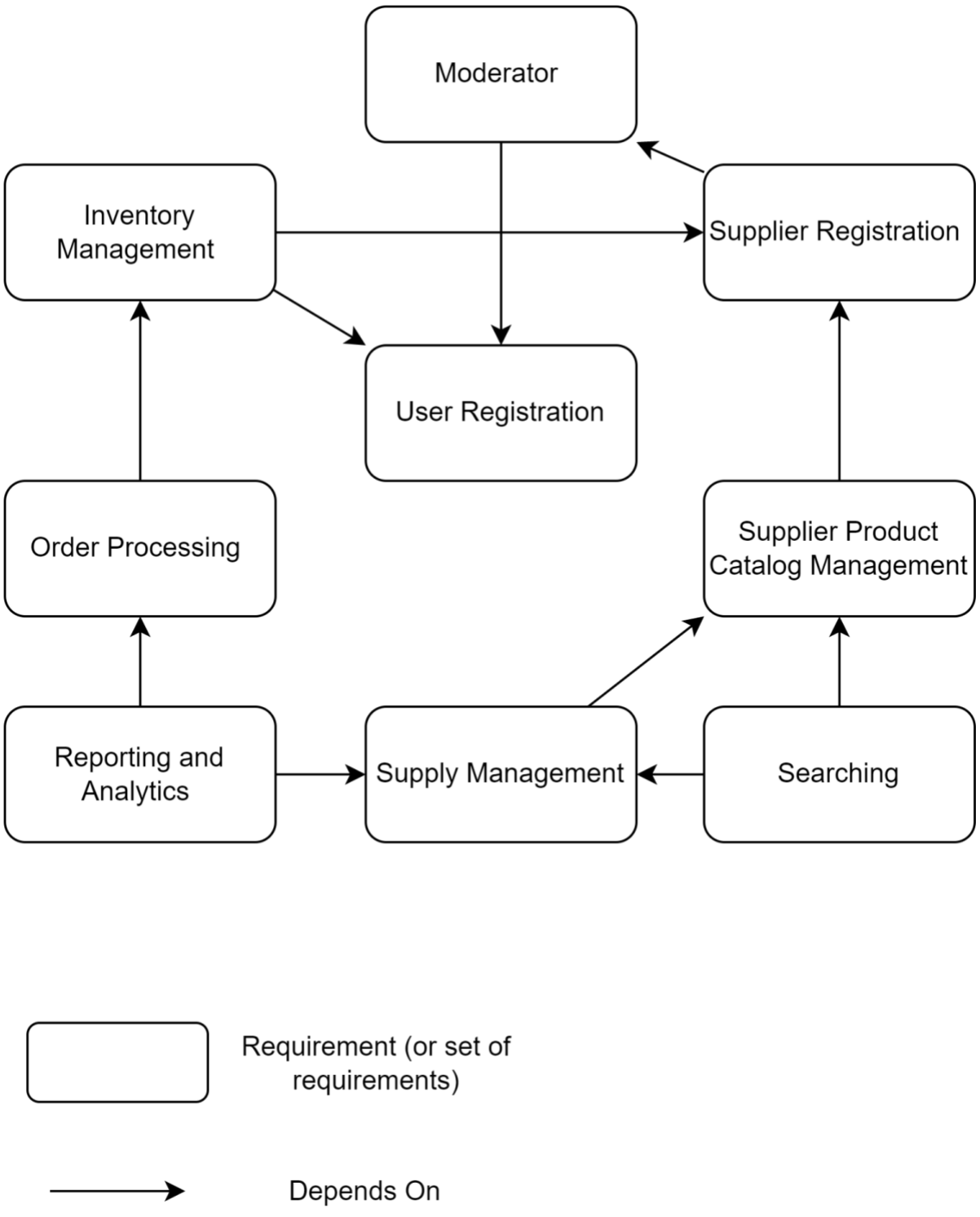
- Report Generation

  **Scenario:** The system should allow authorized personnel to generate reports on demand or schedule them to be generated and sent automatically. The user should be able to select which data to include in the report and how it should be visualized. The system should also allow the user to export the report in various formats such as PDF or CSV.

- Data Visualization

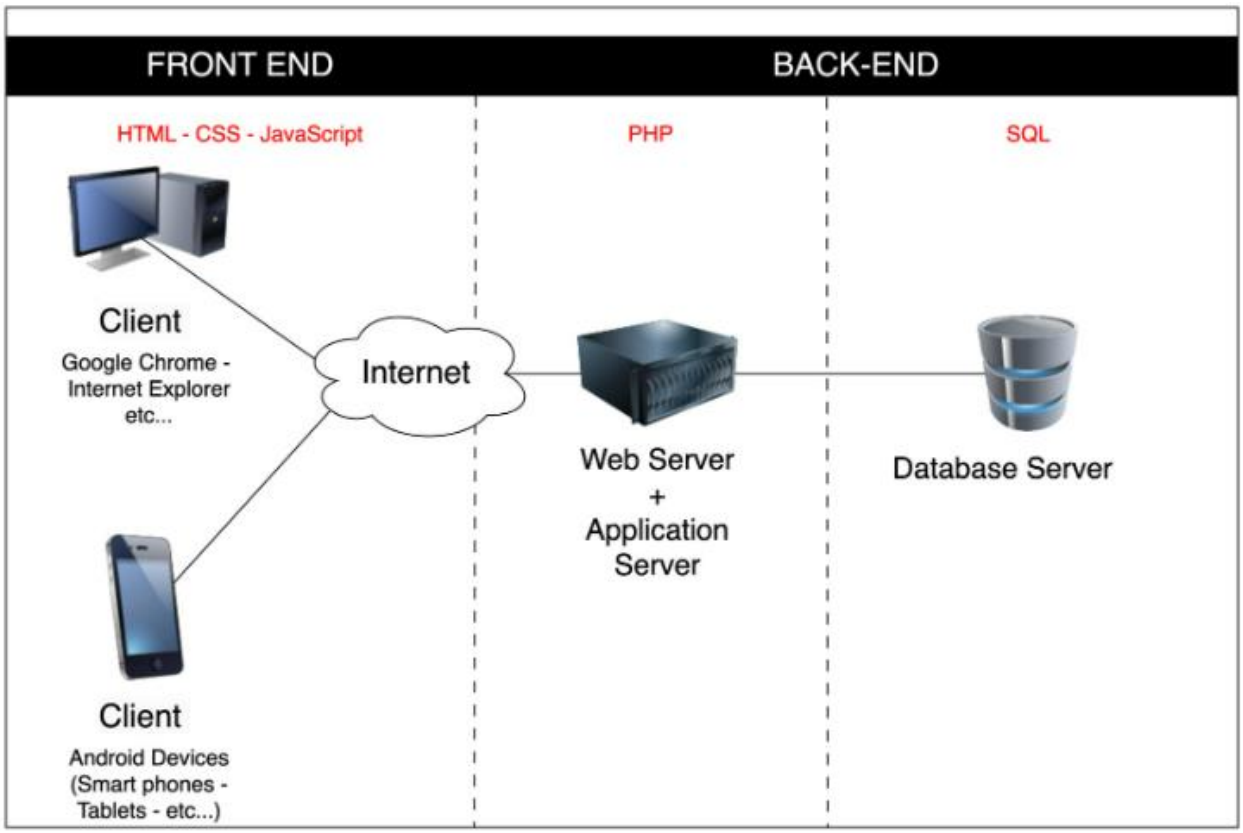
  **Scenario:** The system should provide various data visualization tools such as charts, graphs, and tables to help users analyze and understand the data. The user should be able to customize the data visualization options such as chart type, colors, and labels. The system should also provide interactive features such as filtering and drill-down to allow users to explore the data in more detail.

# Requirement Evolution:



# Software Architecture Design:

The software architecture is composed of a system of software as well as the hardware used to accommodate such software. Since the SCMS is a web-based service, we define the architecture with the following design:

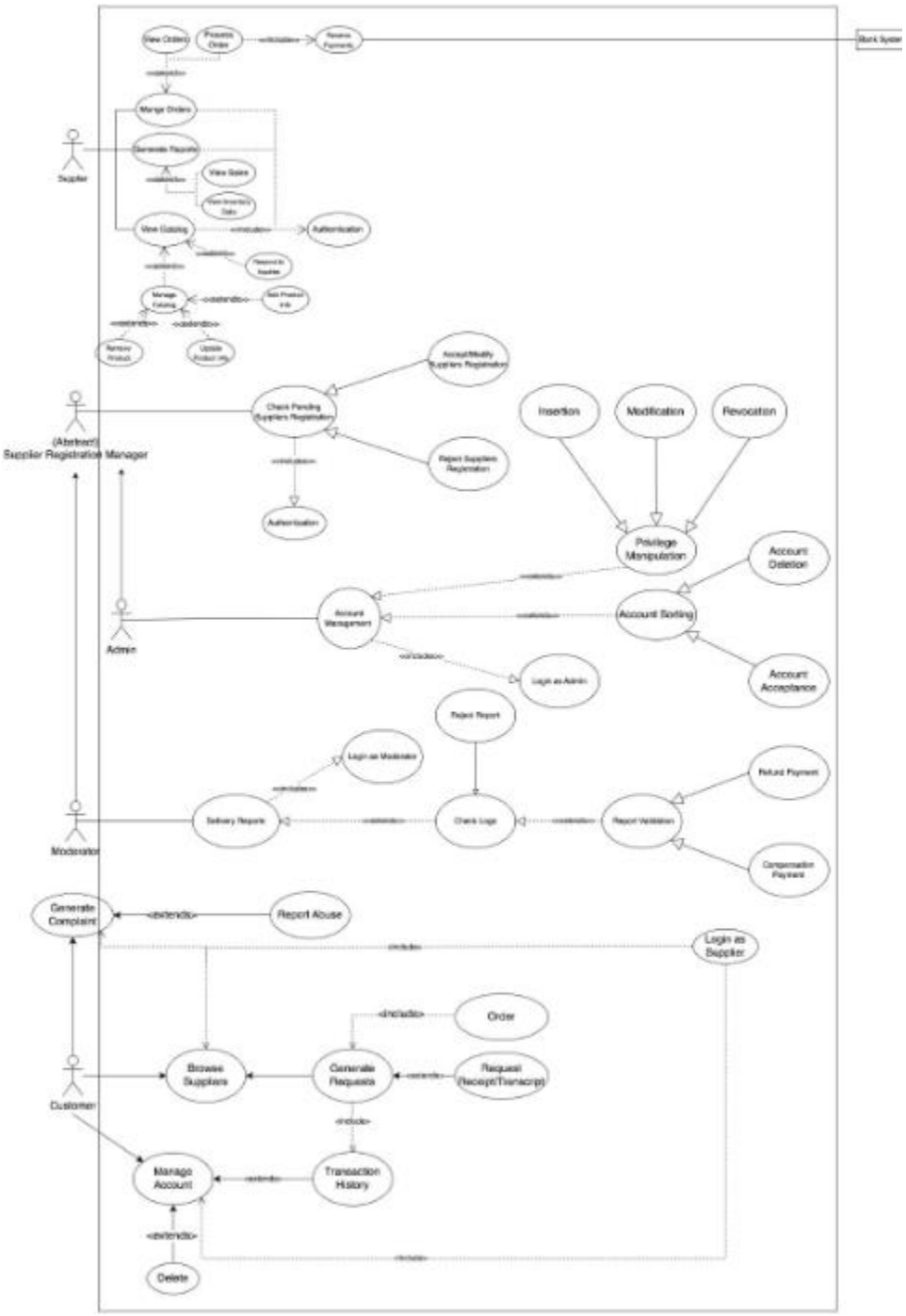



The whole architecture is divided into 2 main parts:

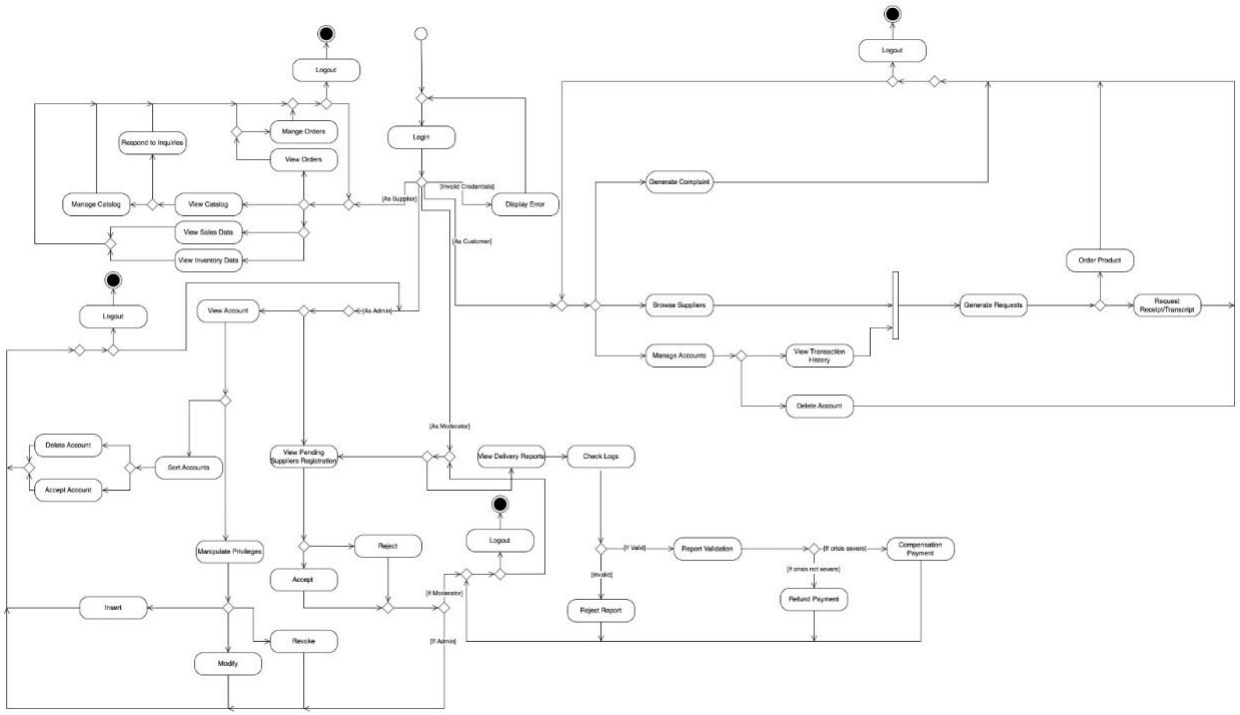
- Front-End part:  Using HTML, CSS, and JavaScript , the system would display all forms of presentation and visuals to any user.
- Back-End part: Using PHP, all web servers and application servers are run in the background. Meanwhile, SQL provides all queries that manipulate and stores data.

Since our SCMS is a web-based service, the 3-tier software architecture is used. The client is all that is displayed on the phone/computer , the database would store all data related to our service, and the server would connect the client to the database.

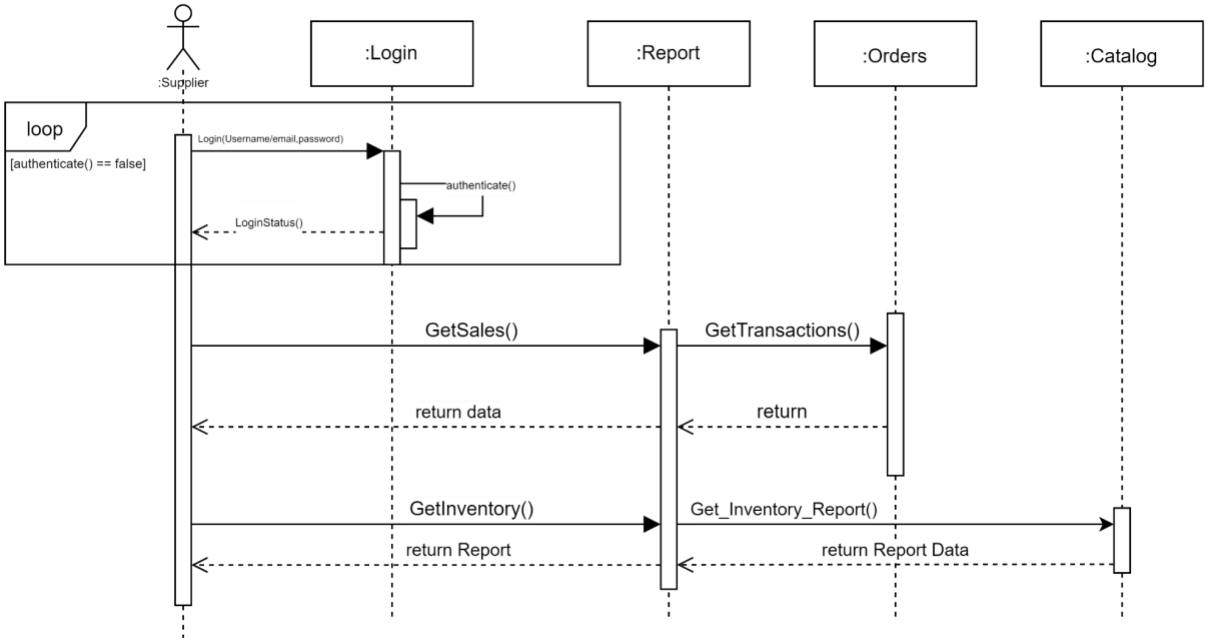
# User Diagram:



# Activity Diagram:

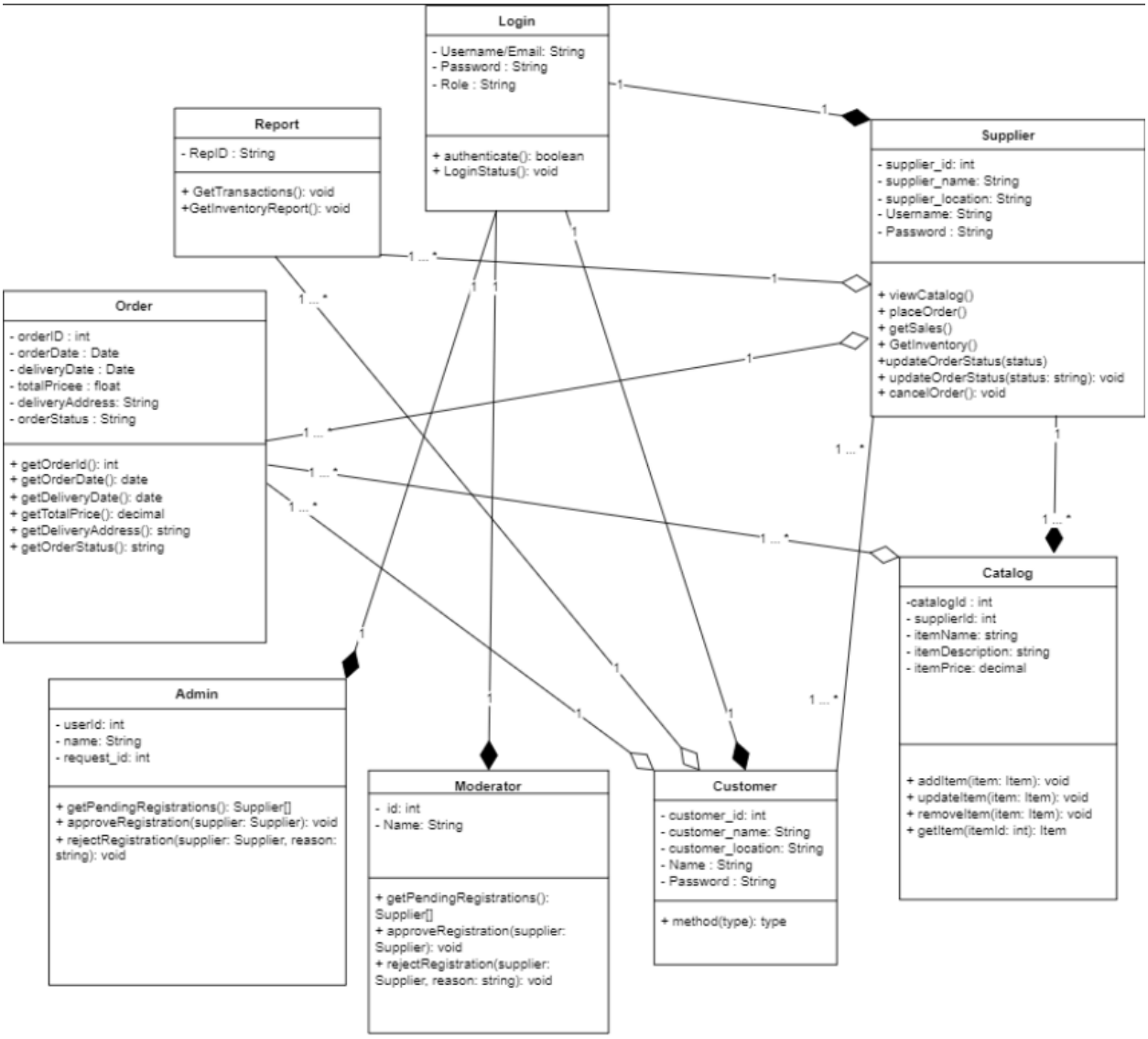


# Sequential Diagram:




The sequence diagram above depicts the sequence of events and messages for a supplier. The supplier has to first successfully login. Then the supplier requests to generate a report for the sales. Then the supplier requests a report for the inventory.

# Class Diagram:




- All classes of the UML Diagram contain their own sets of getters and setters.
- There are different sets of the relationships in the diagrams, be they one to one and one to many.
- 1 means a one relationship, 1…* signifies a many relationship. 1…* and 1..* on the same line mean a many to many relationship.
- Black diamond signifies aggregation while the diamond signifies composition.

# Frontend:

All the code provided on GitHub:
https://github.com/A-Damaj/Supply-managment-system-Web-SE-Project

## Login page (supply-chain-login.html):

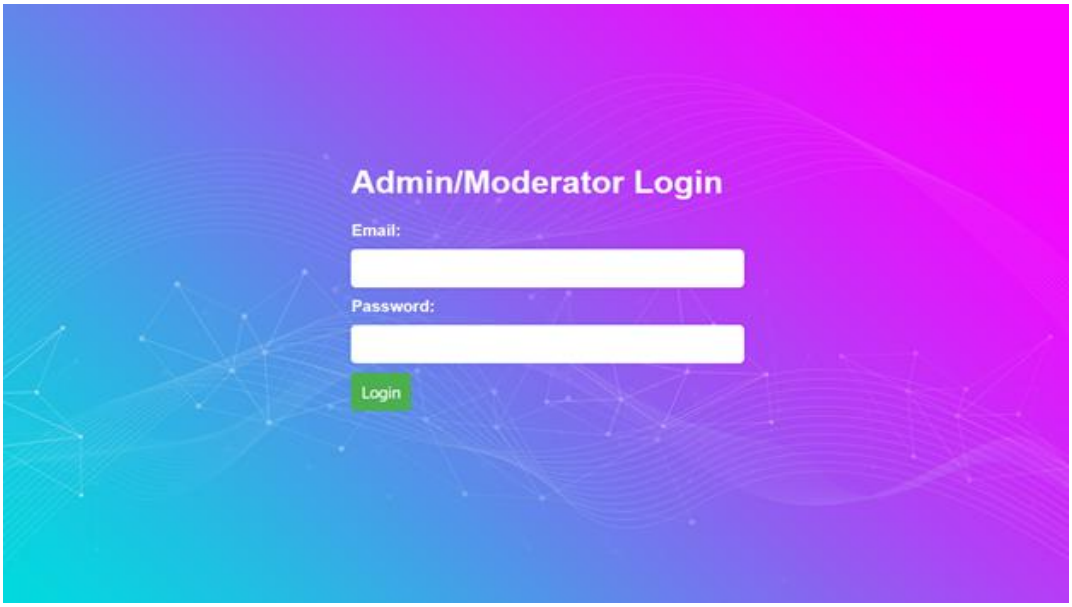


This is the login page for both suppliers and customers. It allows them to enter their credentials and access their respective accounts. Additionally, there is a sign-up button for new users who wish to create an account.

## Sign up page (Signup.html):


This is the signup page that allows both customers and suppliers to create a new account on the website or platform. The page prompts the user to provide necessary information such as their name, email address, password, and other relevant details. After submitting the information, the system will validate and store it securely in the database.

## Admin/Moderator login page (Admin.index):

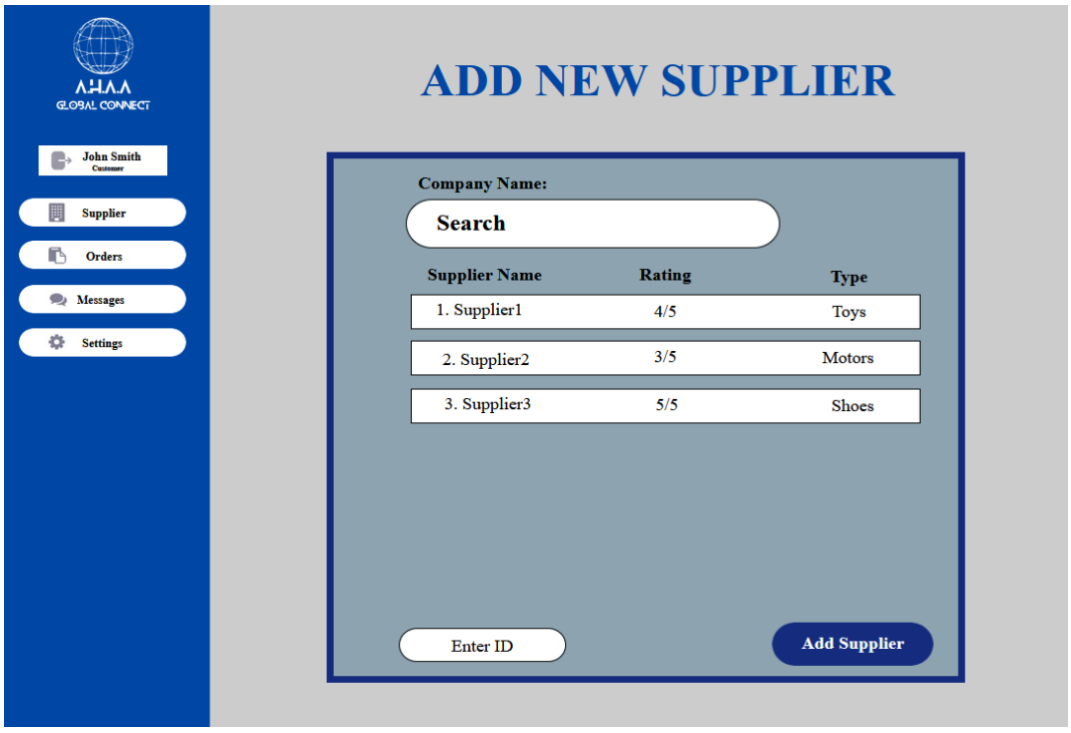



This is the login page for admin/moderator access only. Access credentials are provided exclusively by the Database Administrator to authorized users. This page is not visible to the general public in order to protect it from external threats, such as hackers.

## Edit orders page (edit-supplier.html):

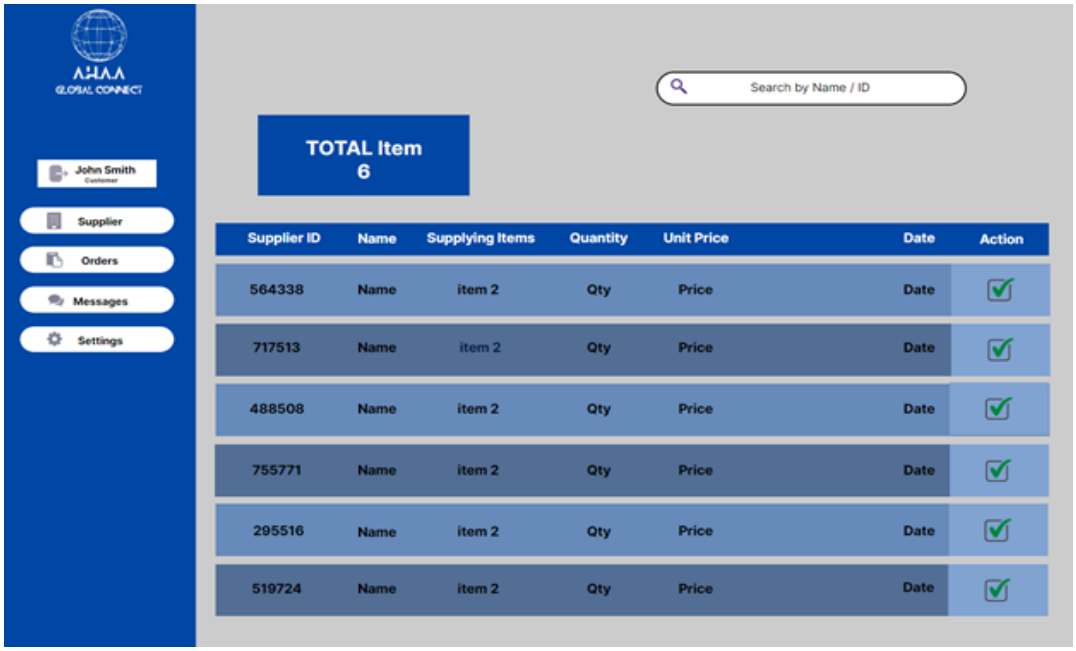

After the customer has successfully logged in, they will have the option to view their order status and search for any specific orders. Additionally, they will be able to modify their orders by either removing them or modifying them, such as increasing or reducing the quantity.

## Supplier Search page (addnew-supplier.html):



This is the Supplier Search page, where customers can search for suppliers by name and add them to their list. Once a supplier is added, their products will be displayed on the homepage for easy access.

## Item search page (suppliers-dashboard.html):

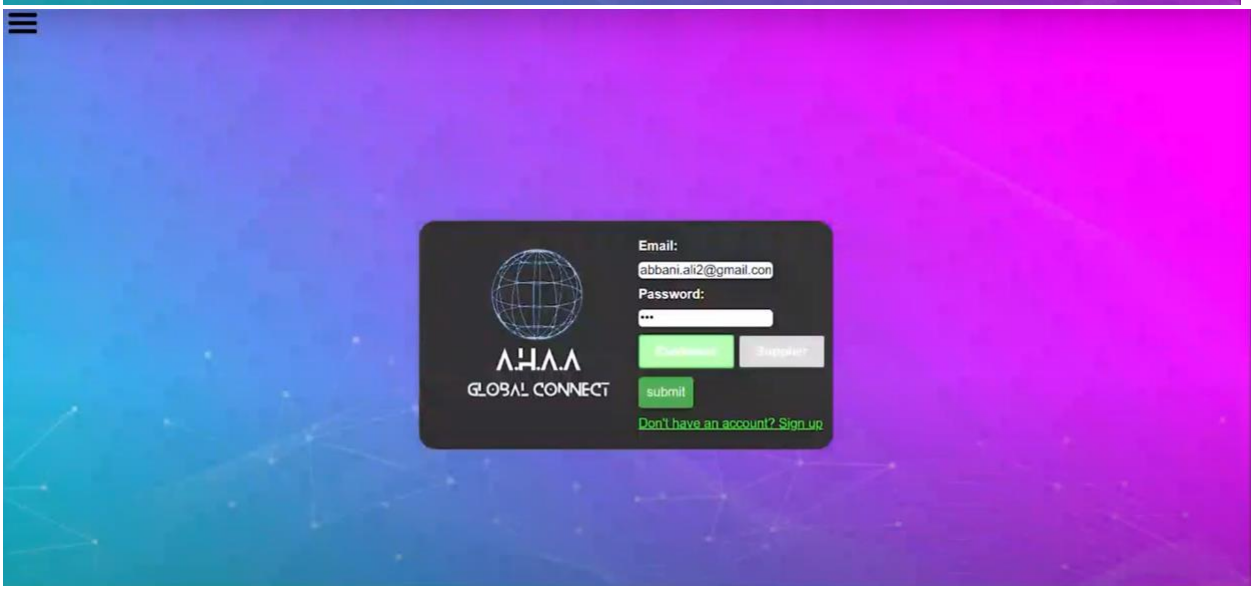



This is the item search page where customers can search for products by name or ID and view the results. The search results display the item's supplier ID, name, available quantity, and other relevant information. Customers can select the checkbox next to the desired item to add it to their order.

# Backend:

All the code provided on GitHub:
https://github.com/A-Damaj/Supply-managment-system-Web-SE-Project

## Signup (signup.html) and Login (Login.html):


A login and signup page for a Supply Chain Management System (SCMS) would serve as the gateway for users to access the platform's features and capabilities. The login page would prompt users to enter their username and password, which would be validated against the system's database of authorized users. If the login credentials are correct, the user would be redirected to the system's main dashboard.

The signup page, on the other hand, would allow new users to create an account and gain access to the system. This would typically involve filling out a form with personal and professional information, such as name, email address, company name, and job title. The system would then verify the user's information. Both the login and signup pages would need to be secure and protected against unauthorized access or data breaches. This would involve implementing encryption protocols, firewalls, and other security measures to safeguard user data and prevent malicious attacks.

## Item and supplier search:

https://github.com/A-Damaj/Supply-managment-system-Web-SE-Project/blob/main/SE_project_Backend_and_more/querysup.py

This code establishes a connection to a MySQL database and prompts the user to enter a search term. It then executes two SQL queries to search for suppliers and items in the database with a name similar to the search term. The search terms are processed to add wildcard characters for partial matches. The results of the queries are printed to the console, either showing the supplier or item details or a message indicating no results were found. Finally, the cursor and connection to the database are closed. This code can be used to search for specific suppliers or items within the database using a keyword search.

# Unit Testing:

## Customer Login, signup, and add to cart features:

https://youtu.be/Ss_gMQAOTv8

## Search for item and supplier:

```
Command Prompt
Microsoft Windows [Version 10.0.19044.2846]
(c) Microsoft Corporation. All rights reserved.

C:\Users\[redacted]>cd  C:\Users\[redacted]\Desktop\se\backend

C:\Users\[redacted]\Desktop\se\backend>python querysup.py
Traceback (most recent call last):
  File "C:\Users\[redacted]\.virtualenvs\store-NILGAC8p\lib\site-packages\mysql\connector\network.py", line 600, in open_connection
    self.sock.connect(sockaddr)
ConnectionRefusedError: [WinError 10061] No connection could be made because the target machine actively refused it

The above exception was the direct cause of the following exception:

Traceback (most recent call last):
  File "querysup.py", line 5, in <module>
    host='localhost', database='se')
  File "C:\Users\[redacted]\.virtualenvs\store-NILGAC8p\lib\site-packages\mysql\connector\pooling.py", line 294, in connect
    return MySQLConnection(*args, **kwargs)
  File "C:\Users\[redacted]\.virtualenvs\store-NILGAC8p\lib\site-packages\mysql\connector\connection.py", line 164, in __init__
    self.connect(**kwargs)
  File "C:\Users\[redacted]\.virtualenvs\store-NILGAC8p\lib\site-packages\mysql\connector\abstracts.py", line 1181, in connect
    self._open_connection()
  File "C:\Users\[redacted]\.virtualenvs\store-NILGAC8p\lib\site-packages\mysql\connector\connection.py", line 570, in _open_connection
    self._socket.open_connection()
  File "C:\Users\[redacted]\.virtualenvs\store-NILGAC8p\lib\site-packages\mysql\connector\network.py", line 609, in open_connection
    ) from err
mysql.connector.errors.InterfaceError: 2003: Can't connect to MySQL server on 'localhost:3306' (10061 No connection could be made because the target machine actively refused it)
```

If the database is down, an error message is displayed.

```
C:\Users\[redacted]\Desktop\se\backend>python querysup.py
Enter a search term: car
No supplier results found.
No item results found.
```

If the search term is not found, a message indicating that no results were found is displayed.

```
C:\Users\[redacted]\Desktop\se\backend>python querysup.py
Enter a search term: t
Supplier results:
(3, '123 Enterprises', 'Chicago', '123_enterprises', '123456', 1)
(4, 'Best Supplies', 'Dallas', 'best_supplies', 'best123', 1)
(5, 'Top Notch Suppliers', 'San Francisco', 'topnotch_suppliers', 'top123', 0)
Item results:
(1, 1, 'Laptop', Decimal('899.99'), 50)
(2, 1, 'Tablet', Decimal('499.99'), 100)
(3, 2, 'Printer', Decimal('199.99'), 30)
(5, 3, 'Concrete Blocks', Decimal('1.99'), 1000)
```

If the search term is found, the results are displayed.

# Conclusion:

In conclusion, the Supply Chain Management System (SCMS) is a comprehensive platform that provides suppliers and customers with a range of tools to manage their orders, products, and accounts. The system includes login and signup pages for both customers and suppliers, as well as a secure login page for admin/moderator access. The customer interface includes features such as order status tracking, modification of orders, and searching for items and suppliers by name or ID. The system also includes a supplier search page, where customers can search for suppliers by name and add them to their list. Finally, the item search page allows customers to search for products by name or ID and view the results. To ensure the quality and reliability of the system, unit testing was conducted for each of the features. The tests focused on verifying login, validating user information, and searching for items and suppliers. These tests were essential in identifying and resolving any bugs or issues, as well as enhancing the user experience and improving the system's overall functionality.