Project Name: OptiSync
Branch PG-DAC Mar-2023

Documentation On

“OptiSync - Optimizing Business Processes through Synchronized ERP Solutions.
”

PG-DAC March 2023

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Submitted By:
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1. Introduction:

1.1 Document Purpose:

This document communicates the business requirements and scope for developing OptiSync web application. The scope of this document is to define the functional and non-functional requirements , business rules and other constraints requirements. With that this document helps to understand the flow of the project and its modules with illustrative diagrams and images.

1.2 Project Background:

Small Scale manufacturing companies losses customers due to lack of systematic planning and control of working. They most of the time fail to delivery orders on time due to manual control over production process and cannot quickly estimate the product/order delivery time and calculate the cost options for making decisions. Inefficient supply planning and no operational information about the status of stocks in the warehouse lead to poor manufacturing practices. Due to this it is difficult to find out the estimated time for manufacturing and dispatch timelines leading to extending the deadlines and client has to wait for the delivery. This web application primarily focuses on maintaining the data of the order as it passes from on department to another until dispatch.

1.3 Aim & Objectives:

Our application allows management to check status for the current orders being executed, raw material entered in vicinity of the company is digitalized and will help overall stock analysis. Tracing of the parts in production is made easy with detail report of the parts being produced. Data generated in quality control for manufactured product is monitored with help of our application. Our application will help to track delivery and dispatch of the products manufactured.

2. Business Requirements Overview:

- System is the private web application.
- System will be operational only to paid clients.
- This Software solution is made specifically for Small and medium-sized enterprises.
- Clients can streamline their manufacturing process.
- Clients can make better decision based on data coming from shop floor.
- Managers can have an updated status of current orders.

3. Functional Requirements Overview:

OptiSync System consists of nine modules described as below.

1. Login
2. Registration Module
3. Setup(Done by Manager)
4. Admin Module
5. Manager Module
6. Store Module
7. Production Module
8. Assembly & Quality Module
9. Dispatch Module

3.1 Login Module

- **Login Process:** This functionality allows users to log into the OptiSync system using their username and password.
- **Forget Password Process:** Users who have forgotten their password can initiate a password recovery process.

3.2 Registration Module

- Whenever a new company visit this web application and start using this application first registration should be done.
- The new user should fill up the required registration form with the company details and should select the plan suitable for the organization as per the requirement.
- **Plans:** for now there are three subscription plans – Gold, Silver, Bronze. Each of these plan provided different number of user logins and validity as per the customer requirements and according charges are also designed.
- Once registration is successfully done and user gets confirmation then user can do Setup as per requirement.

3.3 Setup Module (Manager completes setup)

- **Sets Products:** This function allows the manager to set up products for their company. A product can have a name, description, and is associated with a company.
- **Sets Part:** This function enables the manager to define parts for the products. A part can have a name, description, and is linked to a product.
- **Sets Raw Material:** This function lets the manager establish raw materials required for parts. A raw material can have a name, description, and is associated with a part.
- **Sets Machine List:** This function allows the manager to create a list of machines. A machine can have a name, description, and is linked to a company.
- **Sets Critical Path Method (CPM):** This function lets the manager set up critical path method information. CPM includes various time intervals for different stages of production and dispatch. It is linked to a company, product, and part.

3.4 Admin Module

- **Login**: Admin can log in using their username and password. The login credentials are stored in the **login** table.
- **Accept New Request**: Admin can review and accept new requests for company registration. The company details are stored in the **company** table.
- **Update Company Status**: Admin can update the status of the pending processes, potentially related to different tables like **login** or **company**.
- **Password Recovery**: Admin can initiate password recovery processes for users. The Manager is has the gate way when it comes to password recovery as before getting to the admin for password Manager request from its company members eg. If Store user wants password to be recovered first that company's manager will be notified.
- **Check Status of User**: Admins can check the status of users with their package expiration status.

3.5 Manager Module

- **Login:** Managers can log in using their username and password. The login credentials are stored in the login table.
- **Registration:** Here the manager is the entity which is registers on this web application . Refer Registration Module 3.2 .
- **Setup:** Managers can set up various components including products, parts, raw materials, machines, etc. Manager add all necessary data in the setup so that all the data will be available to all the roles purchased in that package. Refer Setup Module 3.3.
- **Push New Order:** Managers can initiate a new order process by providing details such as the product, part, order quantity, etc.

- **Status of Order:** Managers can check the status of ongoing order processes, including the achieved quantity, targeted value, dispatch status, etc.

- **Approval for Password Recovery:** Managers can approve requests for password recovery, typically involving updates to the login table.

3.6 Store Module

- **Login**: Store personnel can log in using their username and password. The login credentials are stored in the **login** table.
- **Ordering Raw Material**: Store personnel can initiate orders for raw materials required for production. The orders are stored in the **orders** table.
- **Check Status of Raw Material**: Store personnel check the current stock status of raw materials based on specific identifiers such as raw material ID, part ID, product ID, and order ID.
- **Forward Material to Production/Dispatch/Assembly**: Store personnel can forward raw materials to various stages like production, vendor, dispatch, or assembly.

3.7 Production Module

- **Login:** Production personnel can log in to the system using their credentials to access the production module functionalities.
- **Receives Material from Store:** The production team receives raw materials from the store, which were previously forwarded from the store module.
- **Update Daily Task:** The production team updates the status and progress of daily tasks, ensuring transparency and effective communication within the production process.
- **Forward Part Quantity:** The production team forwards the quantity of finished parts to subsequent modules, such as assembly and quality, ensuring proper distribution and coordination.

3.8 Assembly and Quality Module

- **Login:** Production personnel can log in to the system using their credentials to access the production module functionalities.
- **Receives Parts Production:** This process involves entering information about new parts that need to be assembled. It includes details such as the date, order ID, part ID, received part quantity, targeted value, and achievement status.
- **Update Daily Task:** This process is about updating the daily tasks related to assembly and quality checks. It might involve marking tasks as completed, recording progress, or noting any issues.
- **Forward Product Quantity:** This process entails forwarding the quantity of assembled products that have passed the quality checks. It's a crucial step toward managing inventory and distribution.

3.9 Dispatch

- **Login:** Dispatch personnel can log in to the system using their credentials to access the production module functionalities.
- **Receives material from Assembly & Quality:** This process involves entering details about new products that are ready to be dispatched. It includes information such as the product name, description, and quantity.
- **Update Daily Task Process:** This process focuses on updating daily tasks related to product dispatch. This might involve tasks like preparing products for shipment, verifying quantities, and ensuring proper packaging.
- **Final Dispatch Process:** This process includes the actual dispatch of products to clients. It ensures that the right products, quantities, and details are sent to the clients.

4. Non-Functional Requirement:

- The website should use professional design, look and feel and color scheme.
- Users will have limitations for accessing the application through Internet. The application being an web application it will be accessed by company employee through a pre-paid module. As generally the MSE companies employees around 250 people minimum we will try to support such users employed by the organization.
- Being a private website, the site must follow general usability and Operability for menus, navigation, colors, links and other actions provided on the screens.
- The system should be designed in such a manner that user will be able to complete tasks in minimum number of steps.

5. Use-Case Diagram

5.1 Admin:

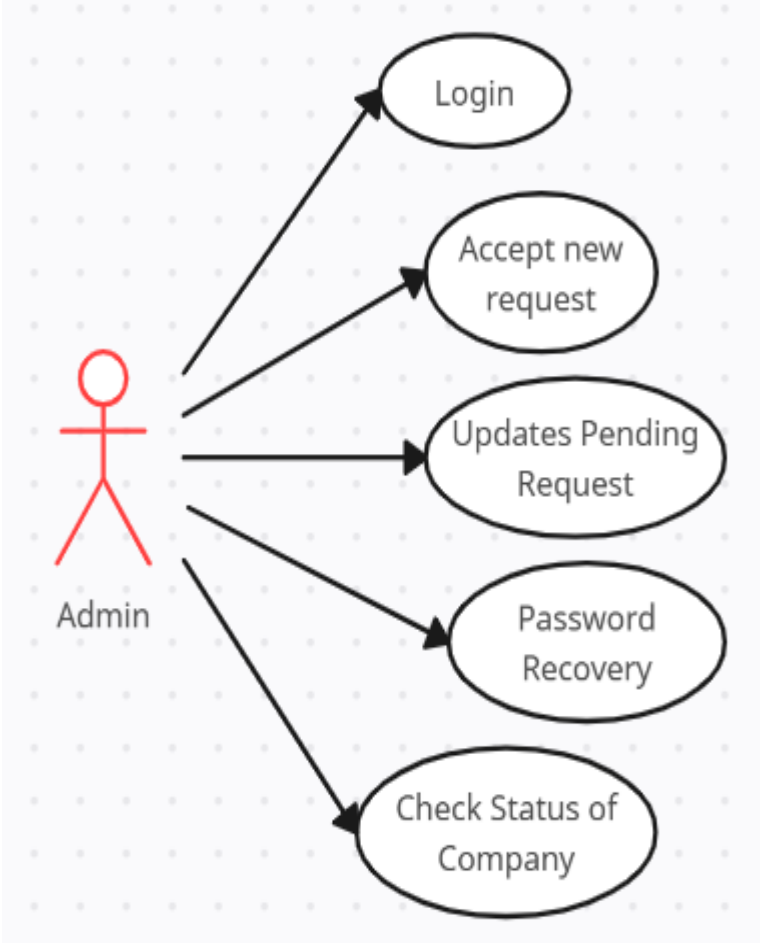


Fig. Use-Case Diagram for Admin

5.2 Setup:

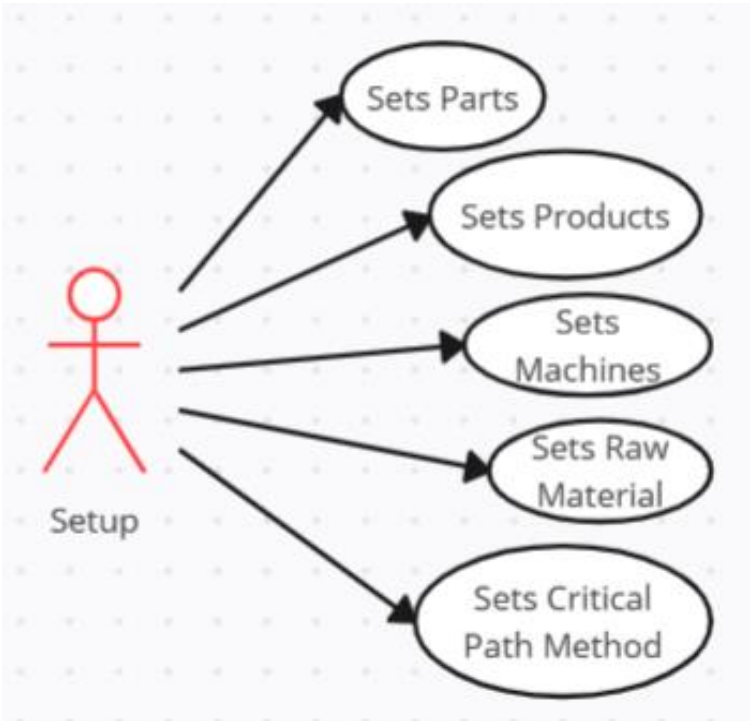


Fig. Use-Case Diagram for Setup

5.3 Manager

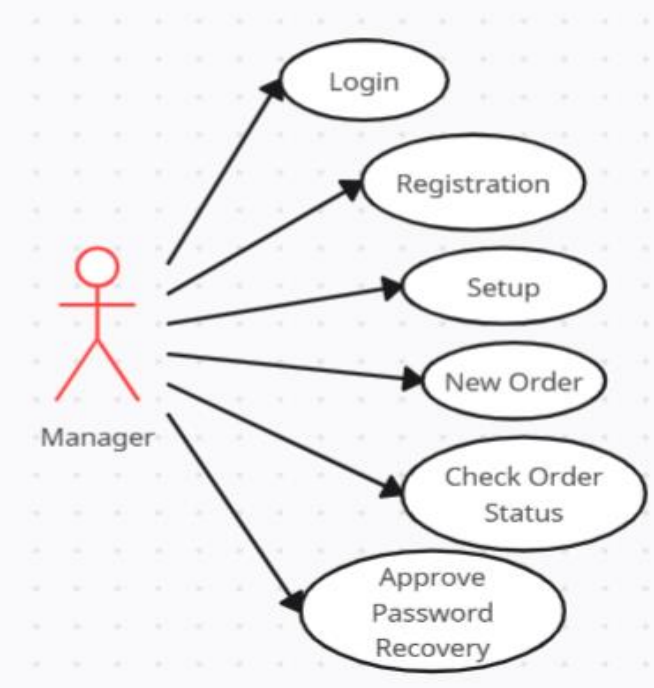


Fig. Use-Case Diagram for Manager

5.4 Store

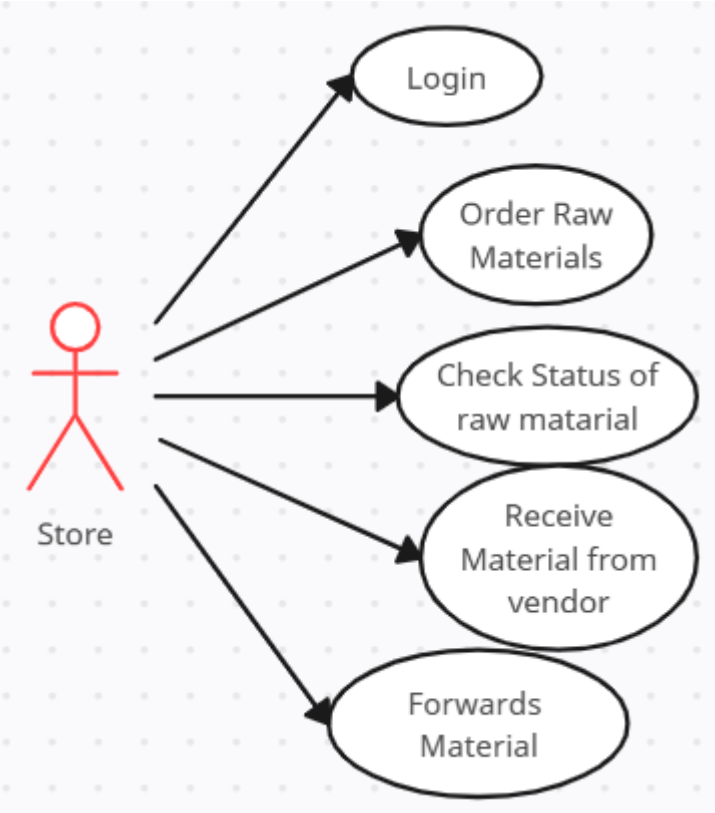


Fig. Use-Case Diagram for Store

5.5 Production

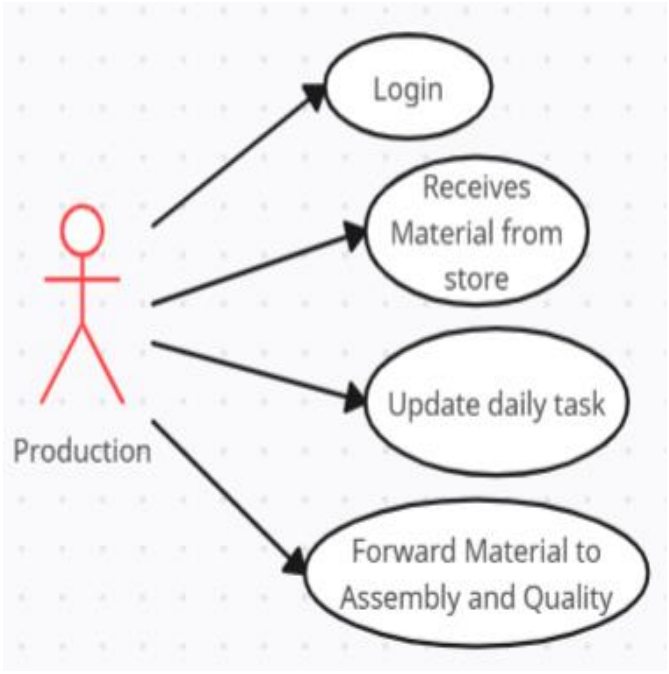


Fig. Use-Case Diagram for Production

5.6 Assembly & Quality

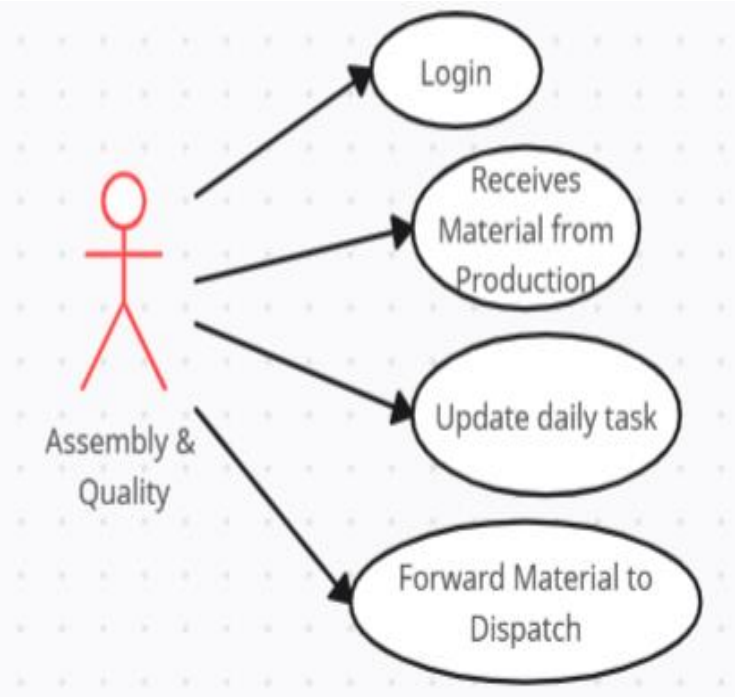


Fig. Use-Case Diagram for Assembly and Quality

5.7 Dispatch

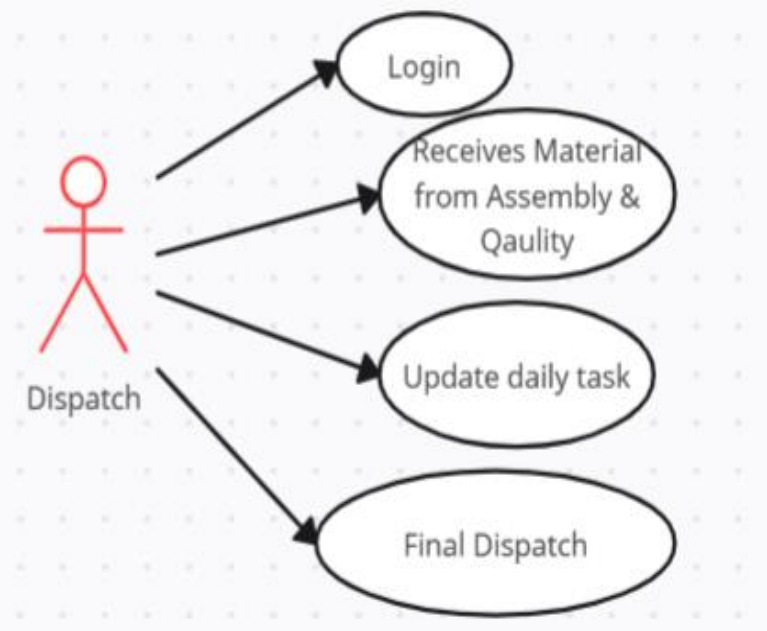


Fig. Use-Case Diagram for Dispatch

6. Database Design:

6.1 Client Table

Field	Data Type	Constraints
client_id	int	**Primary Key**
client_name	varchar(255)	

6.2 Plans Table

Field	Data Type	Constraints
plan_id	int	**Primary Key**
plan_name	varchar(255)	
user_no	int	
duration	int	
price	float	

6.3 Company Table

Field	Data Type	Constraints
company_id	int	**Primary Key**
company_name	varchar(255)	Not Null
person_name	varchar(255)	Not Null
contact_no	varchar(255)	Not Null
email	varchar(255)	Not Null
registration_date	date	Not Null
plan_id	int	Not Null, **Foreign Key**
payment_status	tinyint	
plan_startdate	date	Default Null
plan_enddate	date	Default Null
admin_approval	tinyint	Default 0
mode_of_transaction	varchar(45)	Default 'Online'

6.4 Product Table

Field	Data Type	Constraints
product_id	int	**Primary Key**
product_name	varchar(255)	
product_description	varchar(555)	
company_id	int	**Foreign Key**

6.5 Orders Table

Field	Data Type	Constraints
order_id	int	**Primary Key**
client_id	int	**Foreign Key**
company_id	int	**Foreign Key**
product_id	int	**Foreign Key**
product_qty	int	
start_date	date	
end_date	date	
dispatch_qty	int	Default 0

6.6 Parts Table

Field	Data Type	Constraints
part_id	int	**Primary Key**
part_name	varchar(255)	Not Null
part_description	varchar(555)	Default Null
product_id	int	**Foreign Key**

6.7 Assembly Table

Field	Data Type	Constraints
assembly_entry_no	int	**Primary Key**
date	date	
order_id	int	**Foreign Key**
part_id	int	**Foreign Key**
received_part_qty	int	
targeted_value	int	
achieve	int	

6.8 CPM Table

Field	Data Type	Constraints
assembly_entry_no	int	**Primary Key**
date	date	
order_id	int	**Foreign Key**
part_id	int	**Foreign Key**
received_part_qty	int	
targeted_value	int	
achieve	int	

6.9 Dispatch Status Table

Field	Data Type	Constraints
dispatch_status_id	int	**Primary Key**
status_meaning	varchar(45)	

6.10 Dispatch Table

Field	Data Type	Constraints
dispatch_entry_no	int	**Primary Key**
date	date	Default Null
order_id	int	**Foreign Key**
product_id	int	**Foreign Key**
received_product_qty	int	Default Null
tageted_value	int	Default Null
achieved	int	Default Null
dispatcher_name	varchar(255)	Default Null
dispatch_status	int	**Foreign Key**

6.11 Forward Table

Field	Data Type	Constraints
forward_id	int	Primary Key
name	varchar(255)	Not Null

6.12 Roles Table

Field	Data Type	Constraints
role_id	int	**Primary Key**
name	varchar(255)	

6.13 Login

Field	Data Type	Constraints
login_id	int	**Primary Key**
username	varchar(255)	Default Null
password	varchar(255)	Default Null
company_id	int	**Foreign Key**
role_id	int	**Foreign Key**
forgetpass_status	bit(1)	Default Null
setup_status	bit(1)	Default Null

6.14 Machine Table

Field	Data Type	Constraints
machine_id	int	**Primary Key**
machine_name	varchar(45)	Not Null
machine_description	varchar(555)	Default Null

6.15 Master Vendor Table

Field	Data Type	Constraints
machine_id	int	**Primary Key**
machine_name	varchar(45)	Not Null
machine_description	varchar(555)	Default Null

6.16 Raw Material Table

Field	Data Type	Constraints
raw_material_id	int	**Primary Key**
name	varchar(255)	Not Null
description	varchar(555)	Default Null
part_id	int	**Foreign Key**

6.17 Production Table

Field	Data Type	Constraints
entry_no	int	**Primary Key**
order_id	int	**Foreign Key**
raw_material_id	int	**Foreign Key**
received_qty	int	
date	date	
target_value	int	
achieve	int	
current_qty	int	
operator_name	varchar(255)	Not Null
machine_id	int	**Foreign Key**

6.18 Stock

Field	Data Type	Constraints
stock_entry_no	int	**Primary Key**
stock_date	date	Default Null
raw_material_id	int	**Foreign Key**
raw_material_qty	int	
final_raw_material_qty	int	
part_id	int	**Foreign Key**
part_qty	int	
final_part_qty	int	
company_id	int	**Foreign Key**

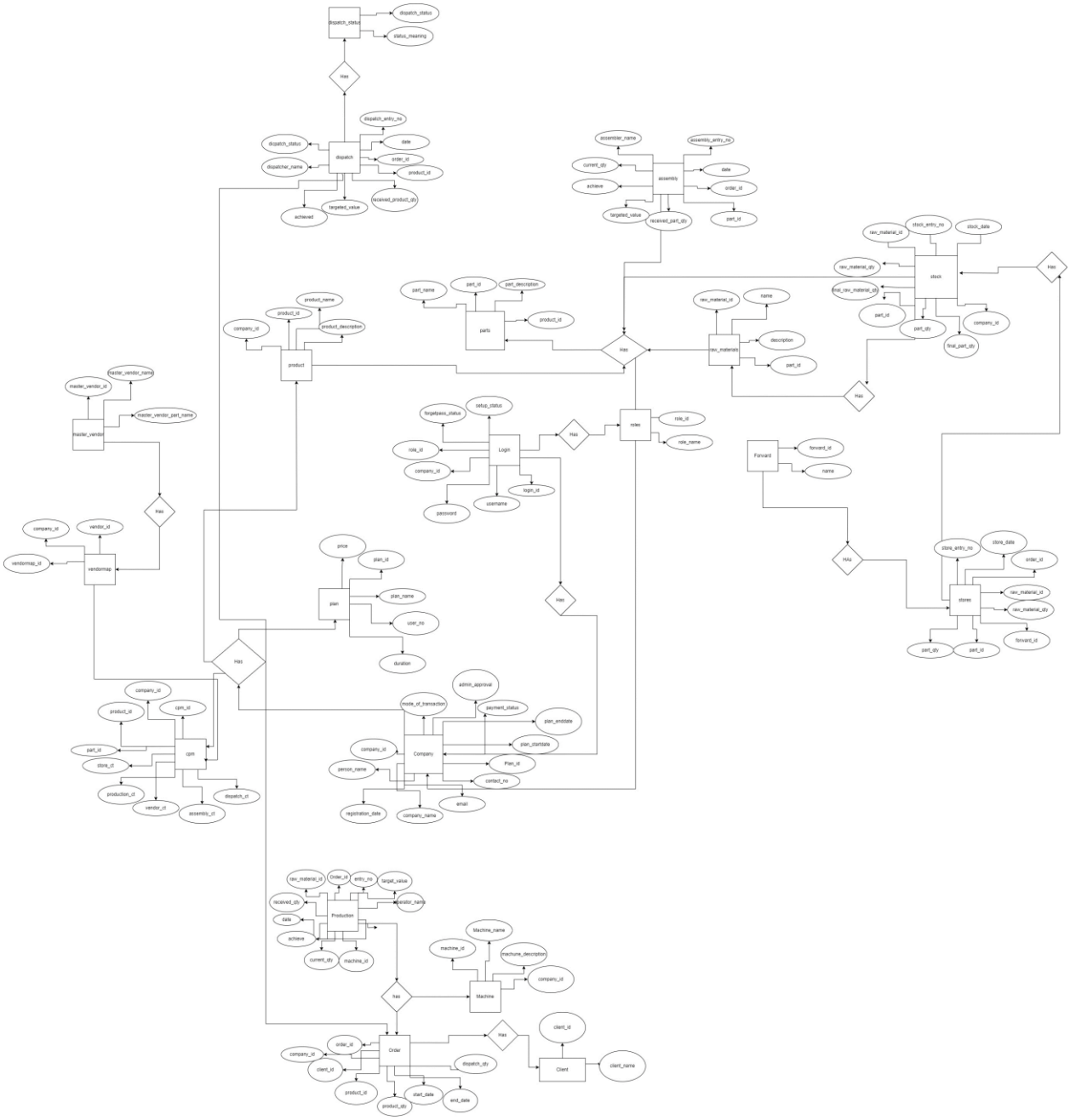
6.19 Stores

Field	Data Type	Constraints
store_entry_no	int	**Primary Key**
store_date	date	Default Null
order_id	int	**Foreign Key**
raw_material_id	int	**Foreign Key**
raw_material_qty	int	Default Null
forward_id	int	Foreign Key
part_id	int	**Foreign Key**
part_qty	int	Default Null

6.20 Vendor Map

Field	Data Type	Constraints
vendor_id	int	**Foreign Key**
company_id	int	**Foreign Key**
vendormap_id	int	**Primary Key**

7. ER-Diagram:

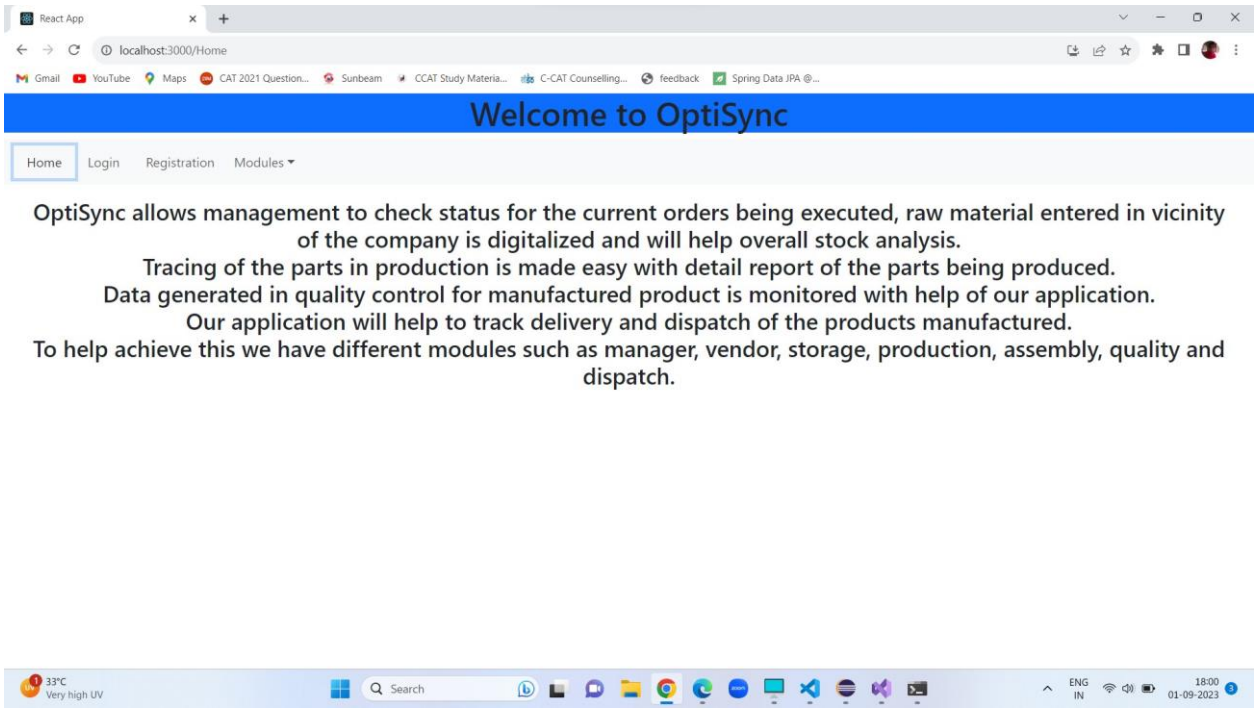


E-R diagram shows database of OptiSync

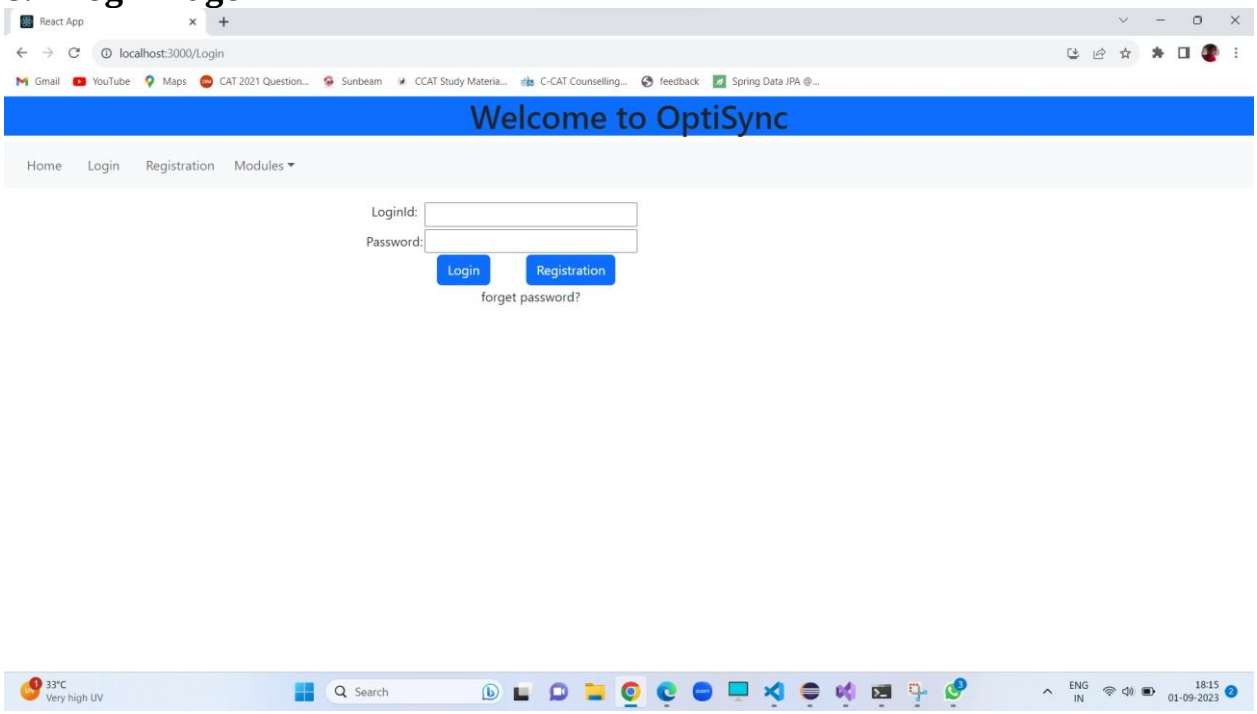
8. Snapshots:

Following snapshot shows the user interface of OptiSync.

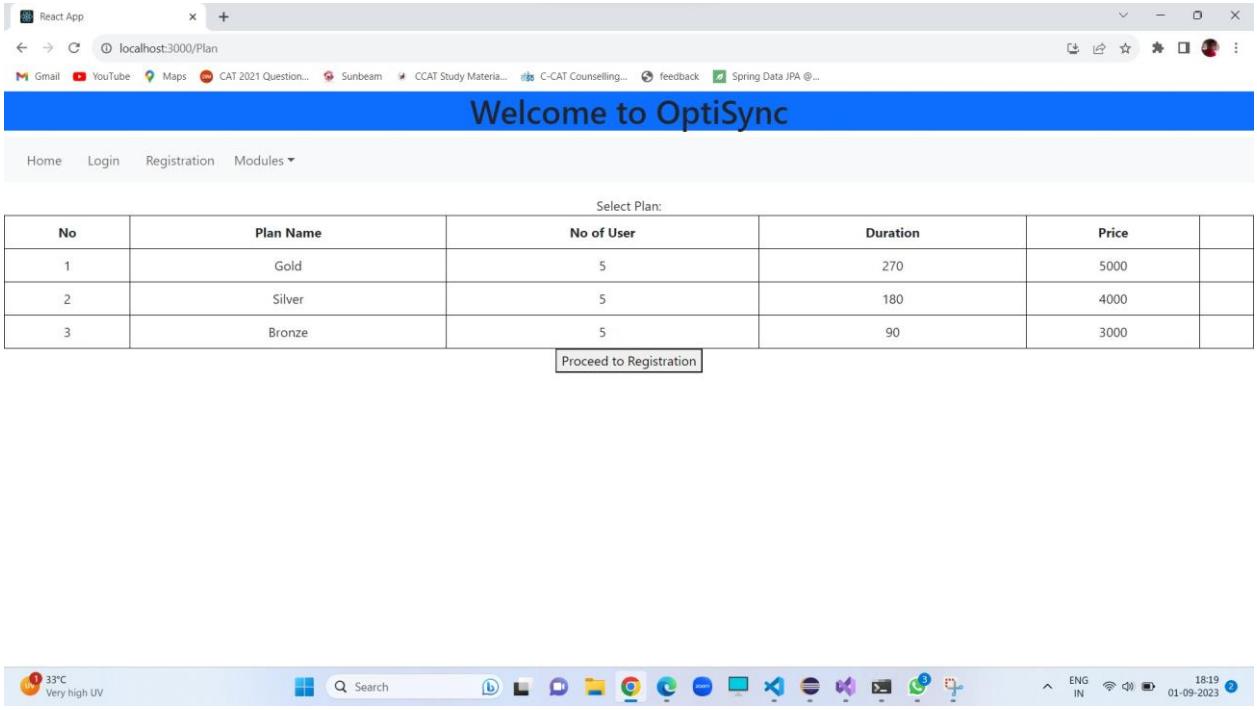
8.1 Home Page:



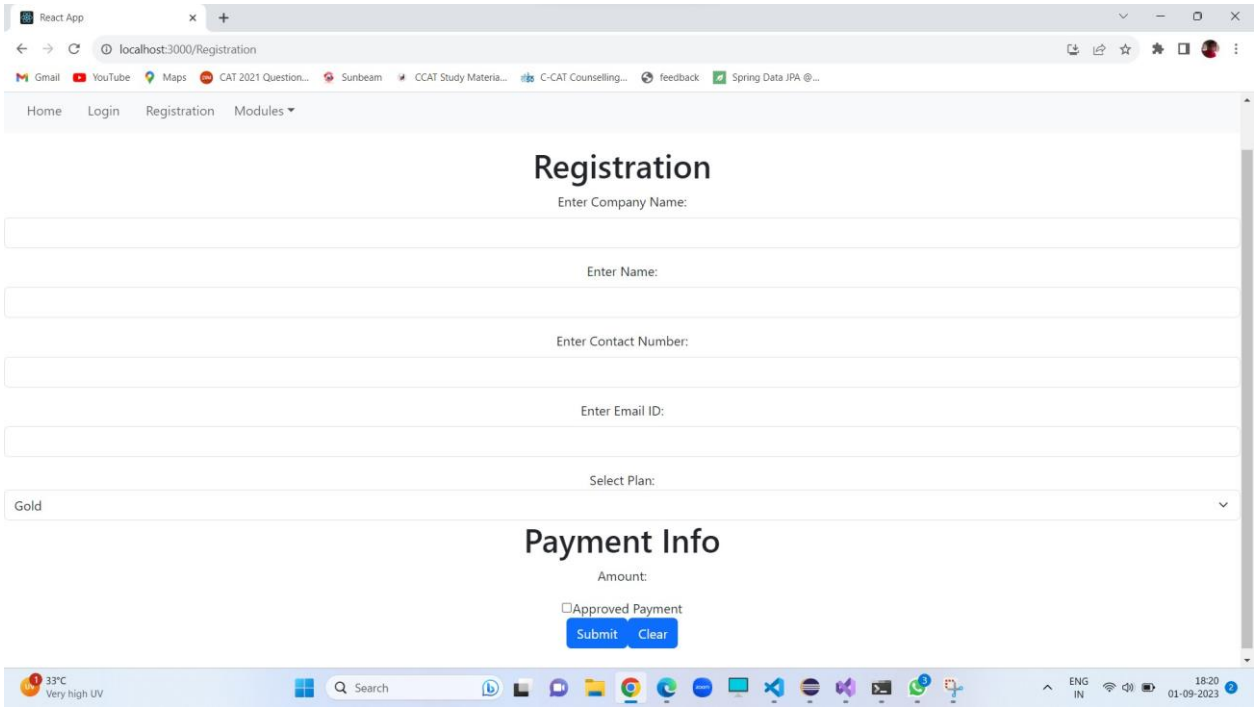
8.2 Login Page



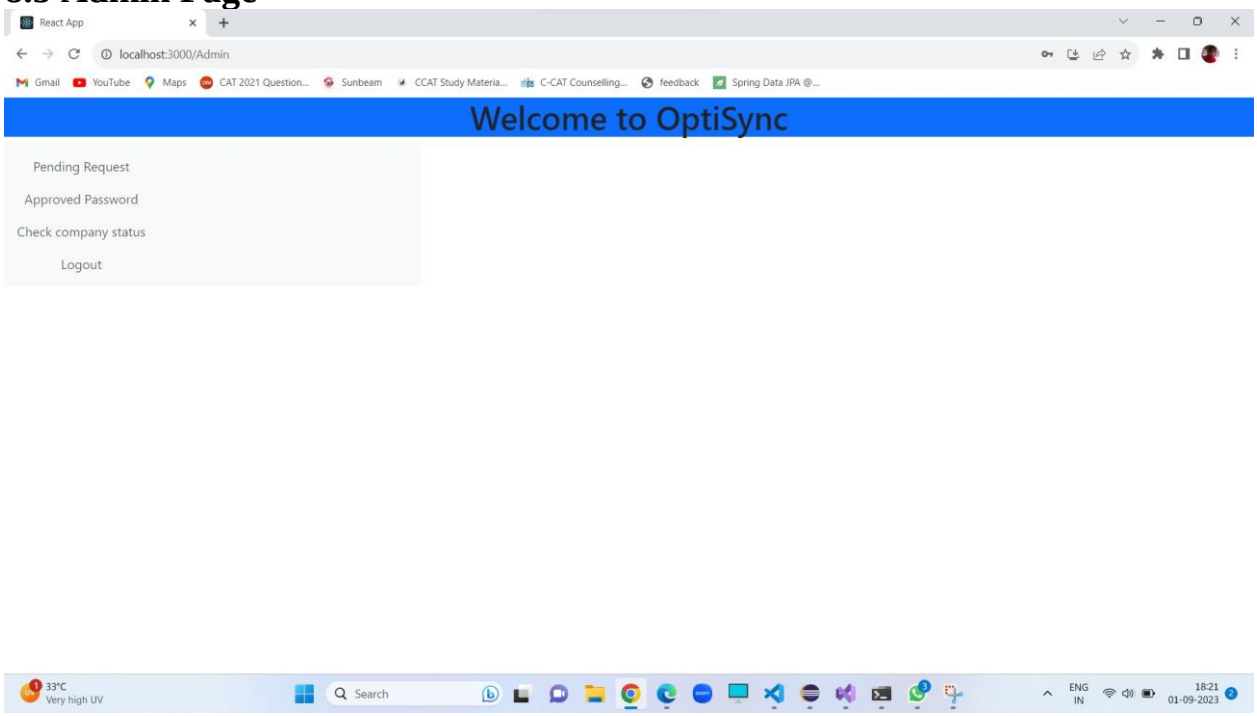
8.3 Offered Plans



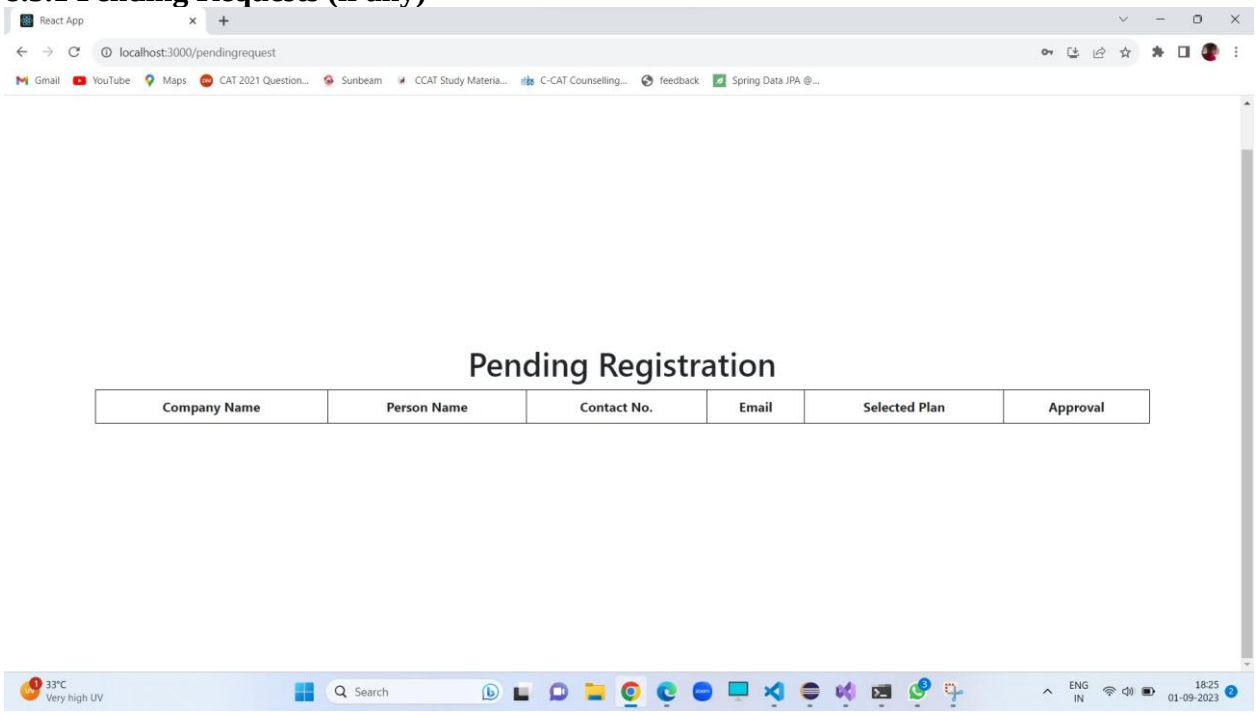
8.4 Registration



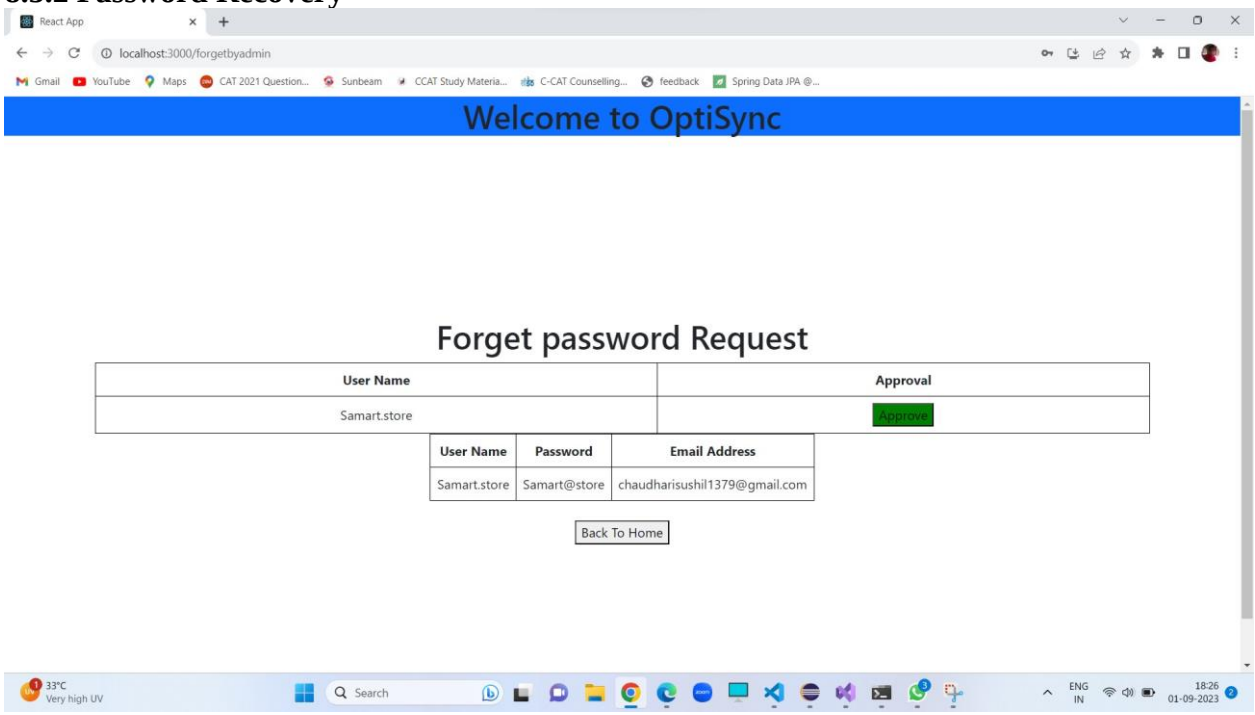
8.5 Admin Page



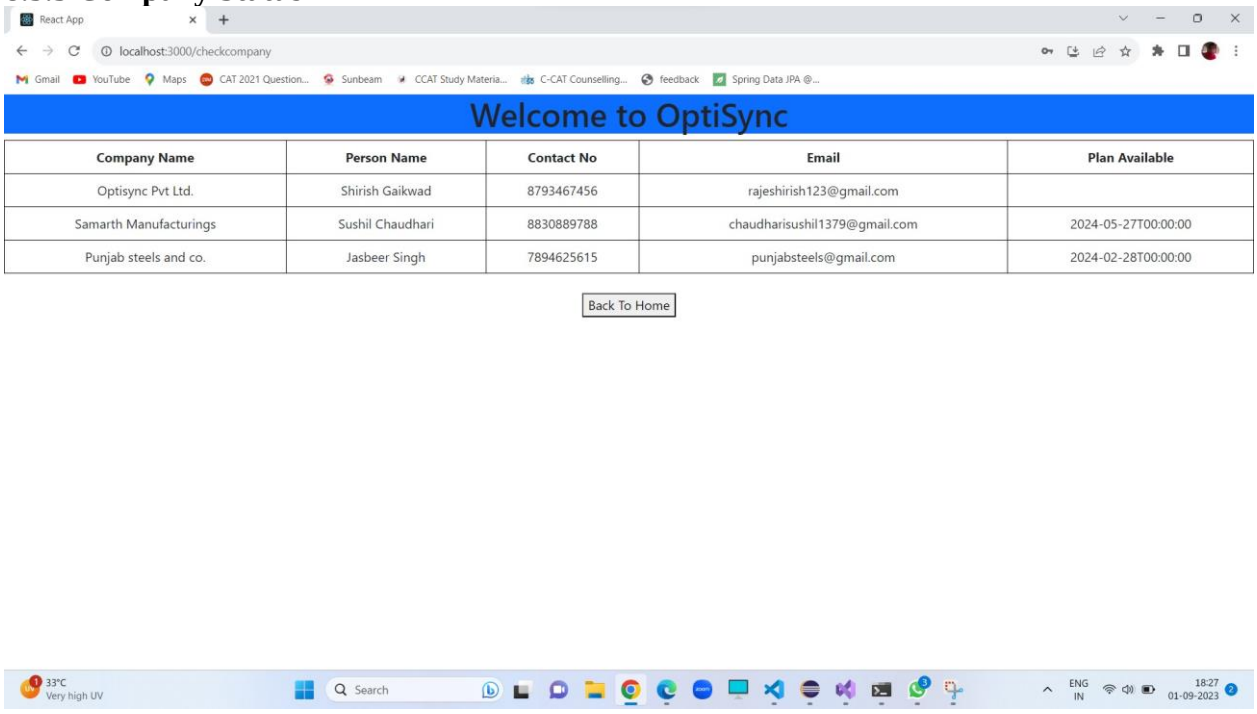
8.5.1 Pending Requests (if any)



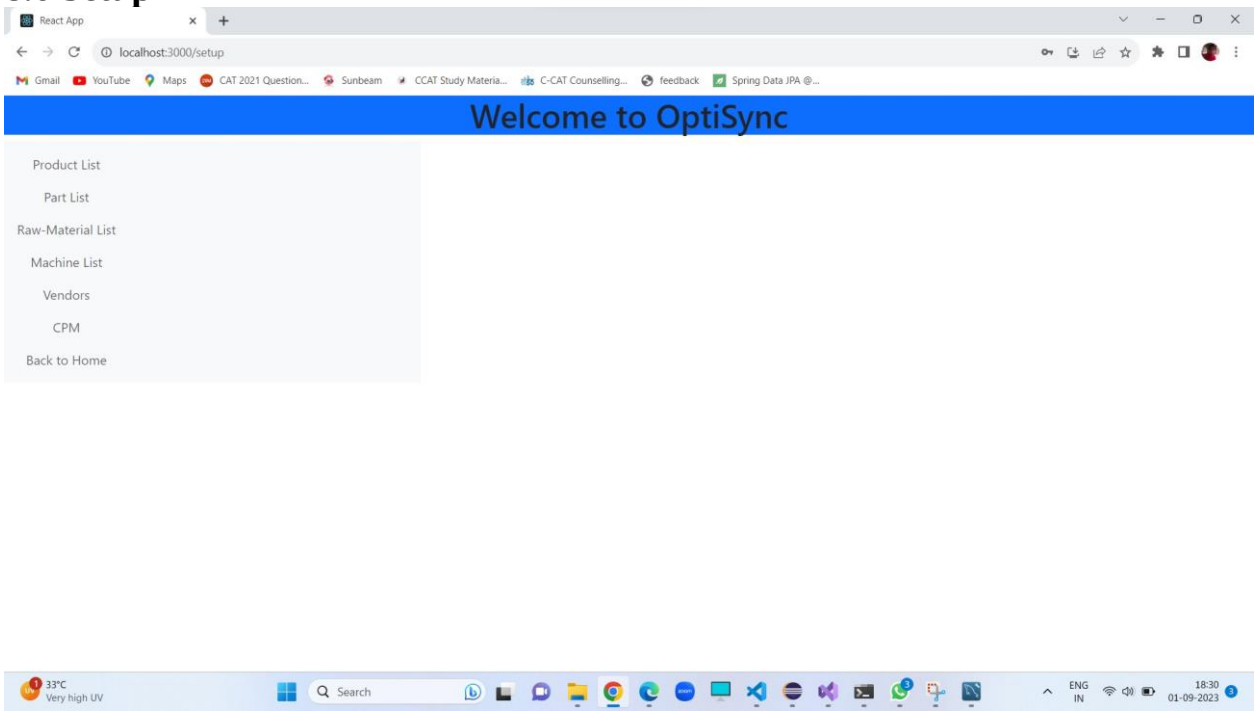
8.5.2 Password Recovery



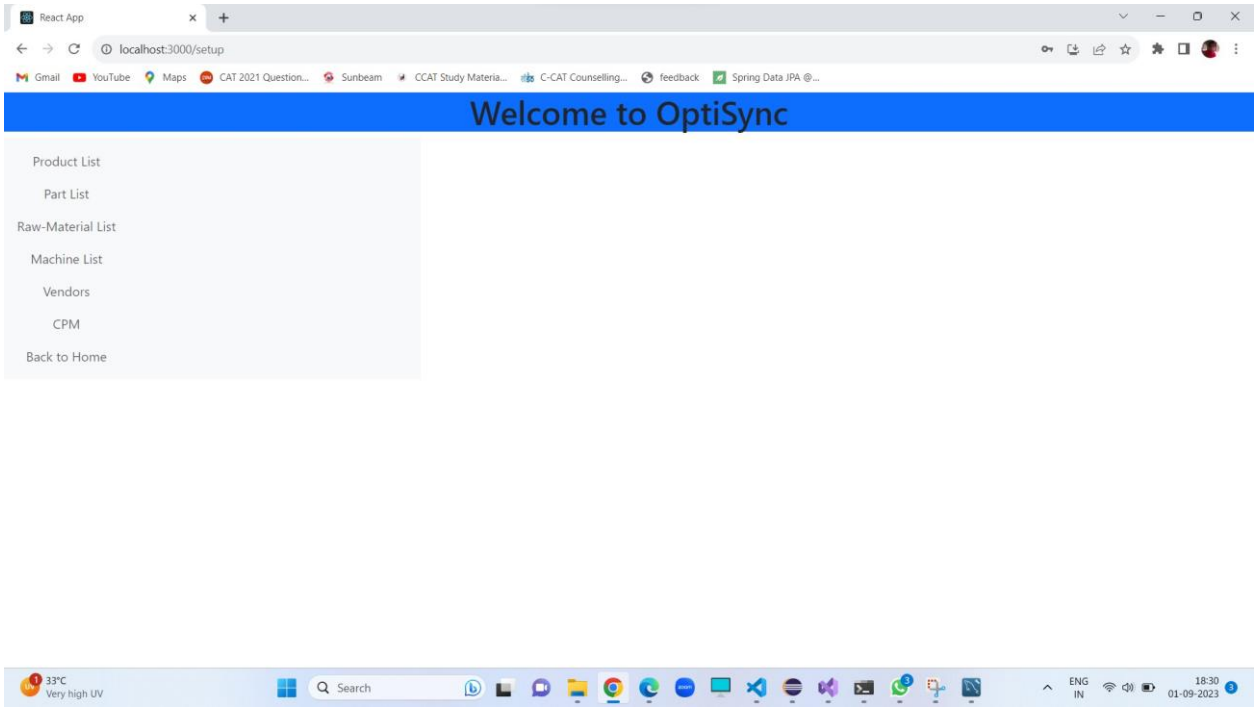
8.5.3 Company Status



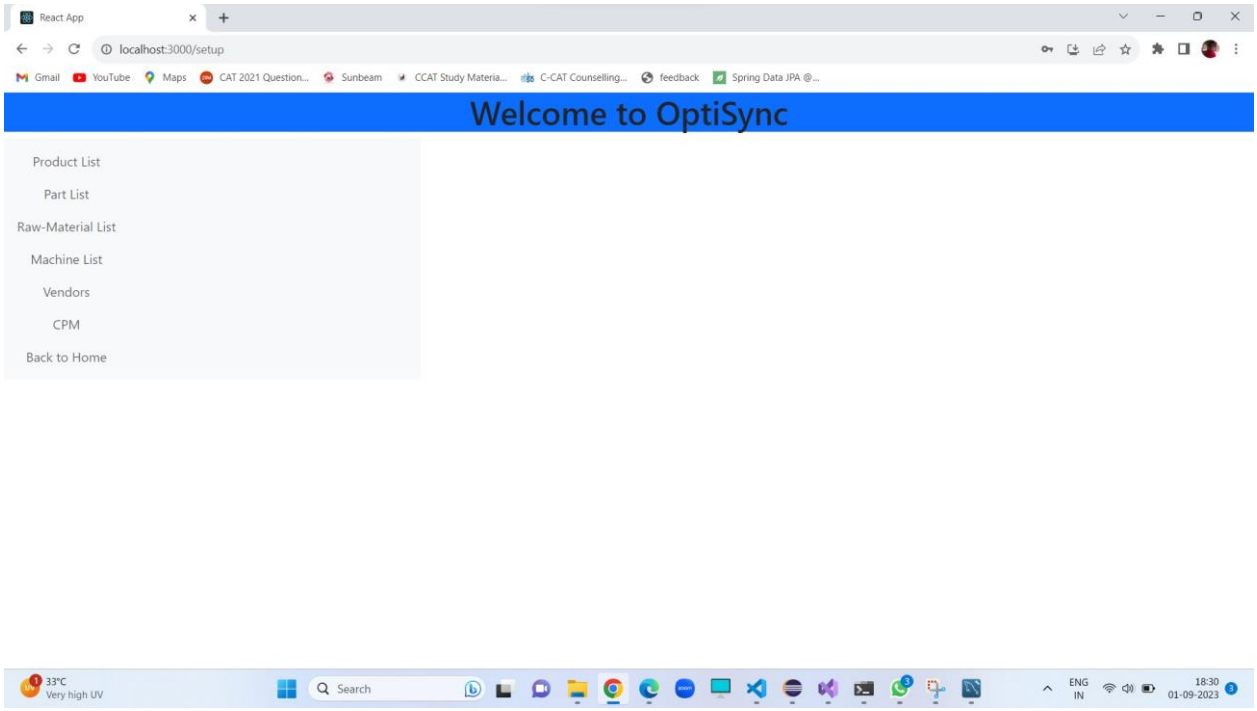
8.6 Setup



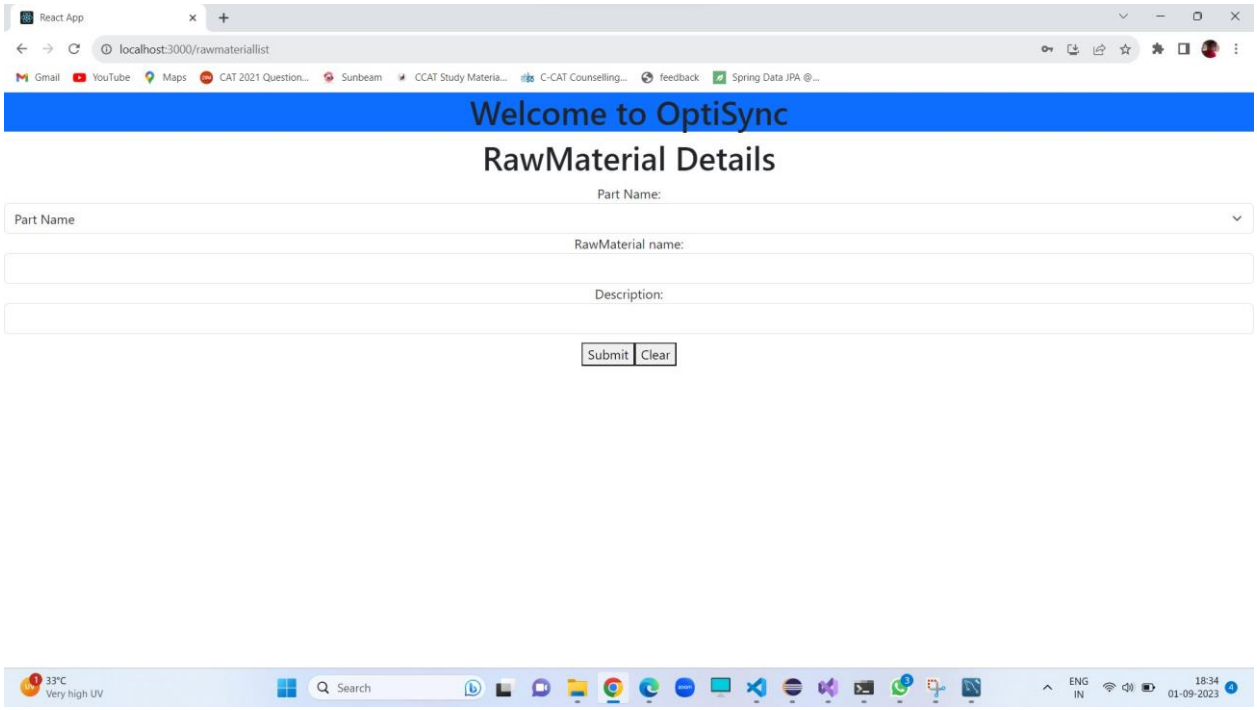
8.6.1 Product details



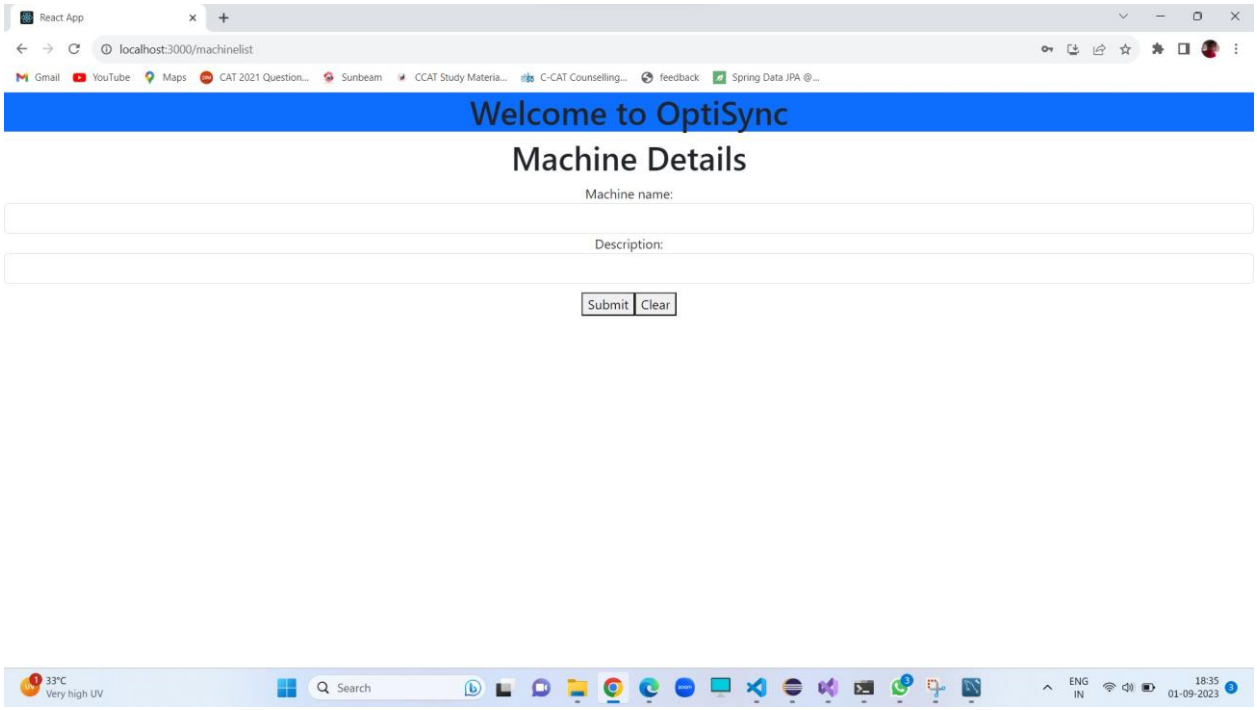
8.6.2 Part Details



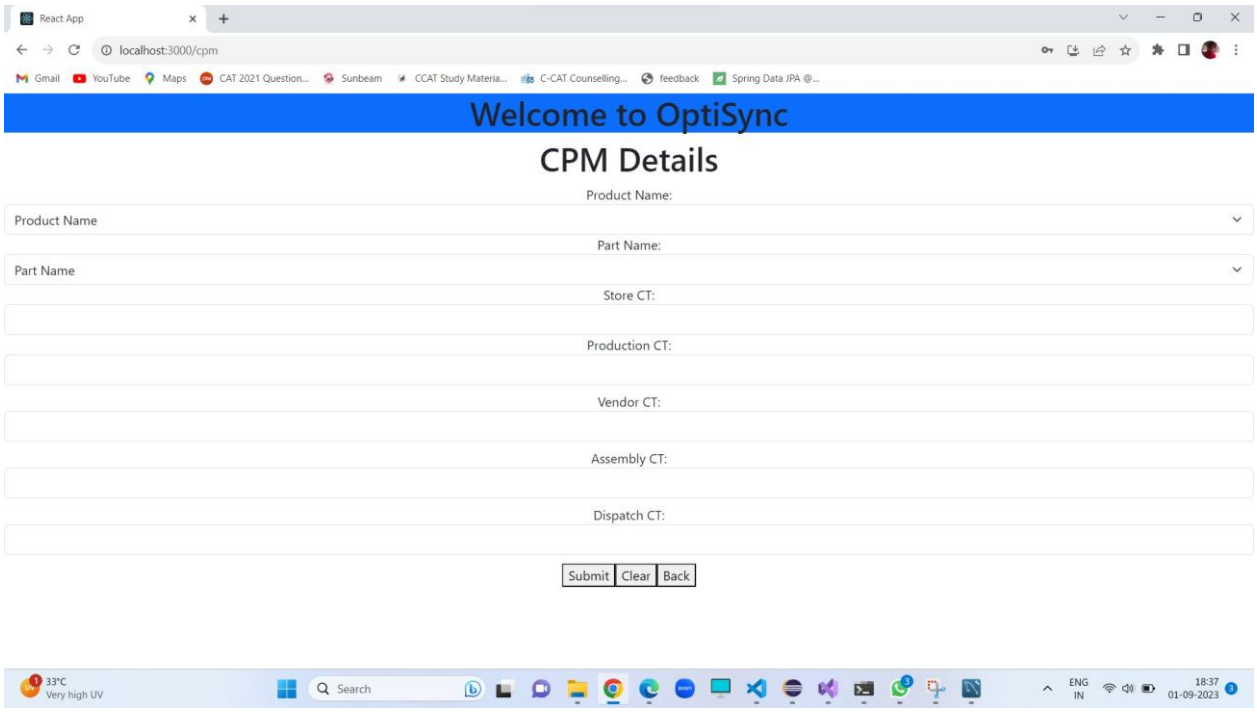
8.6.3 Raw Material Details



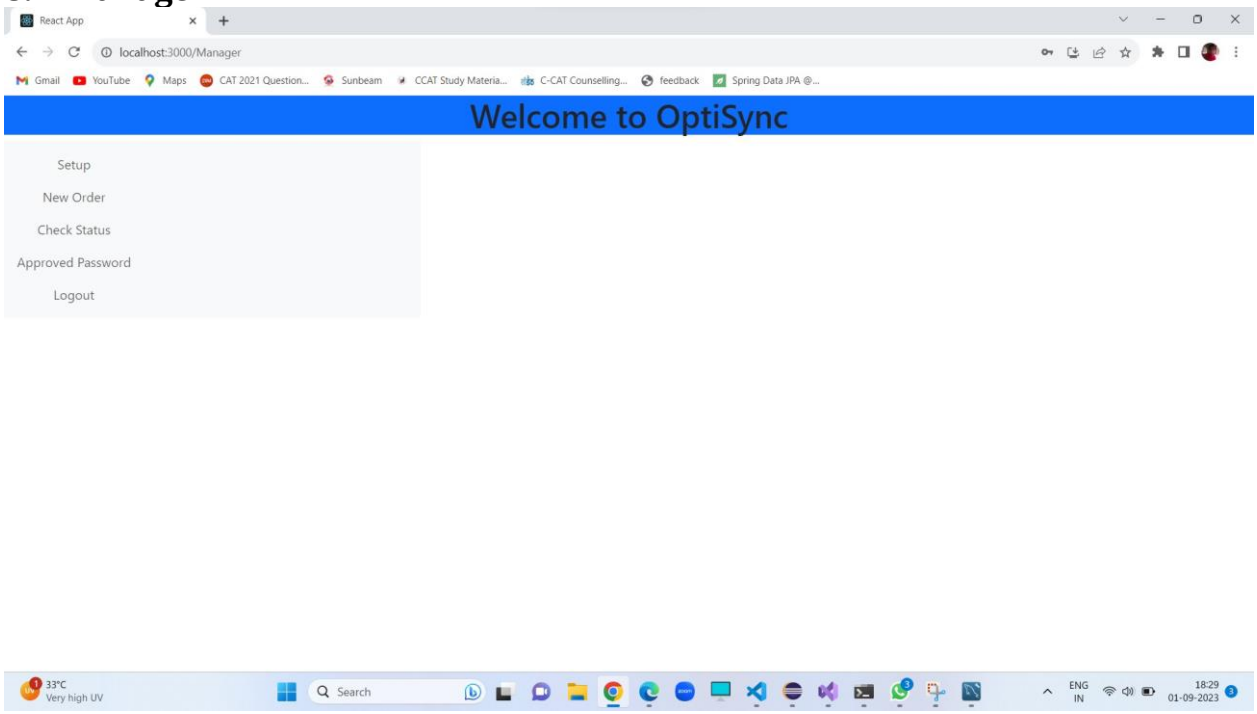
8.6.4 Machine Details



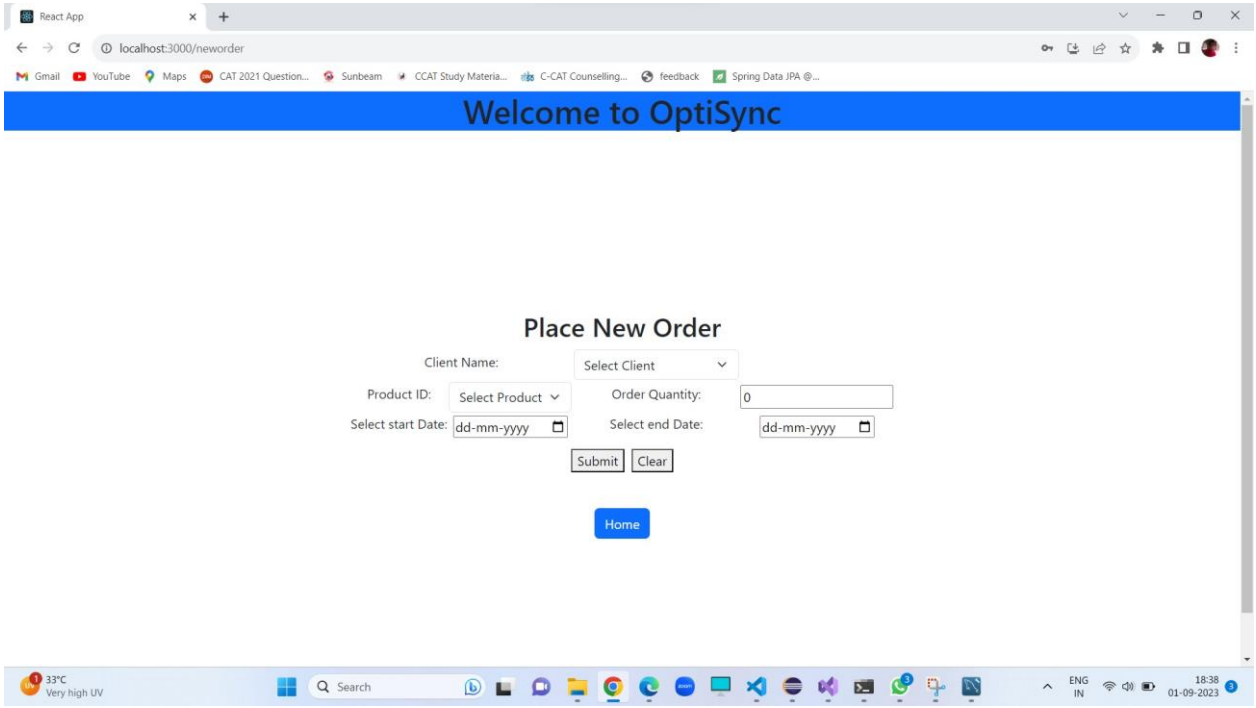
8.6.5 CPM Details



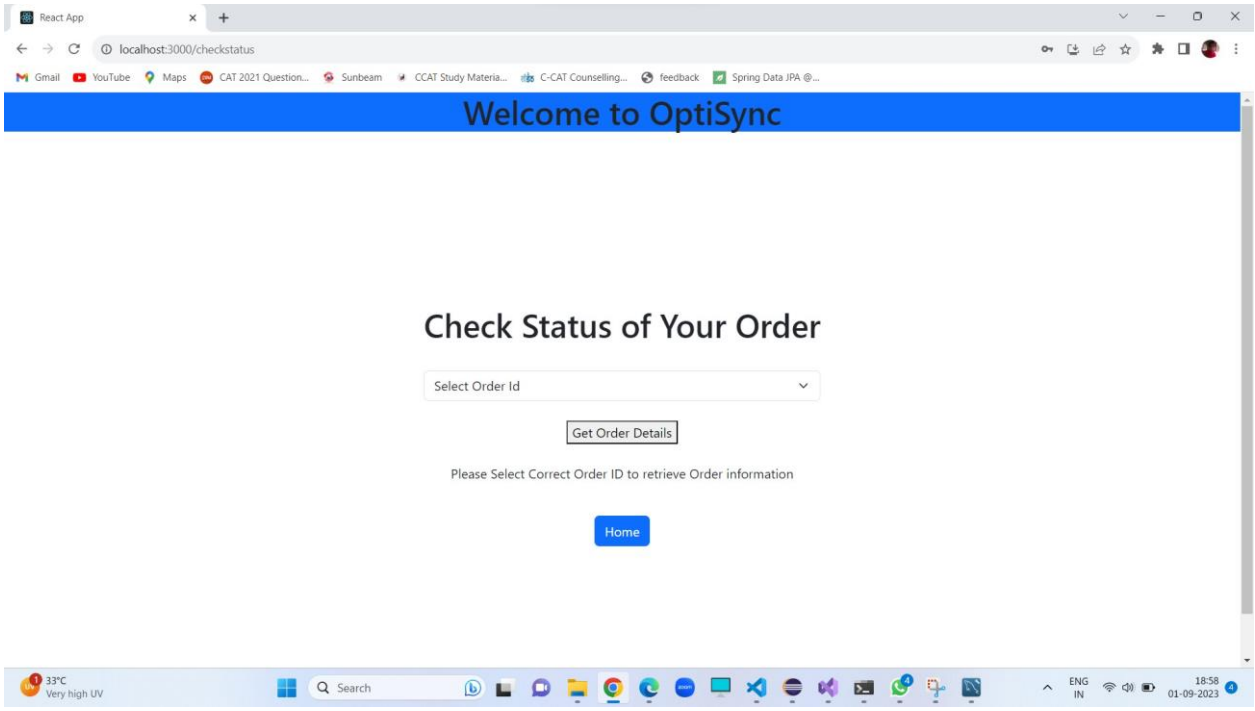
8.7 Manager



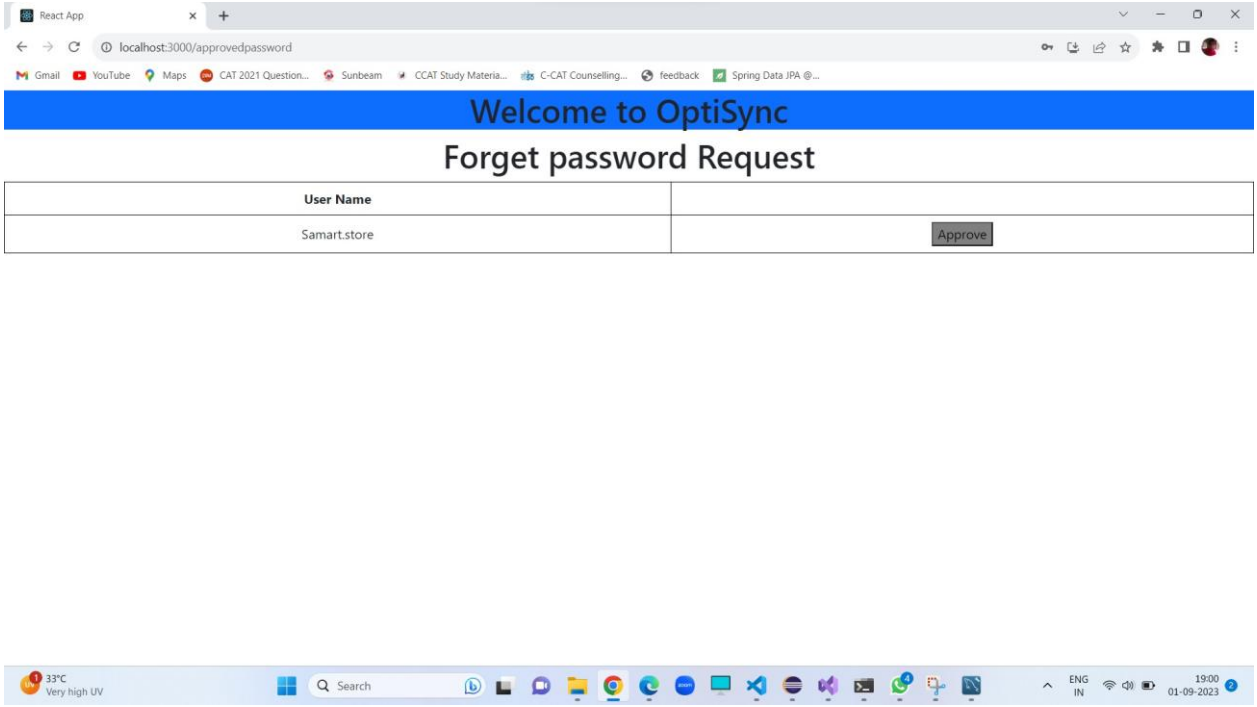
8.7.1 New Order



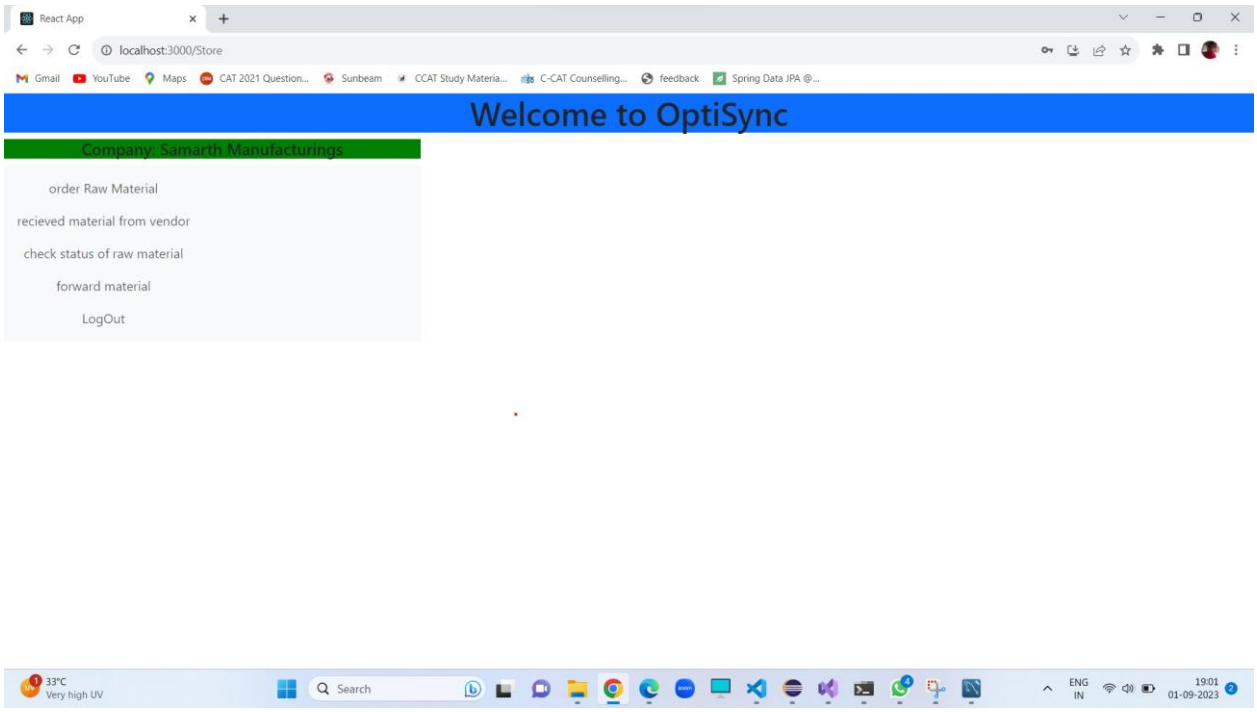
8.7.2 Check Status



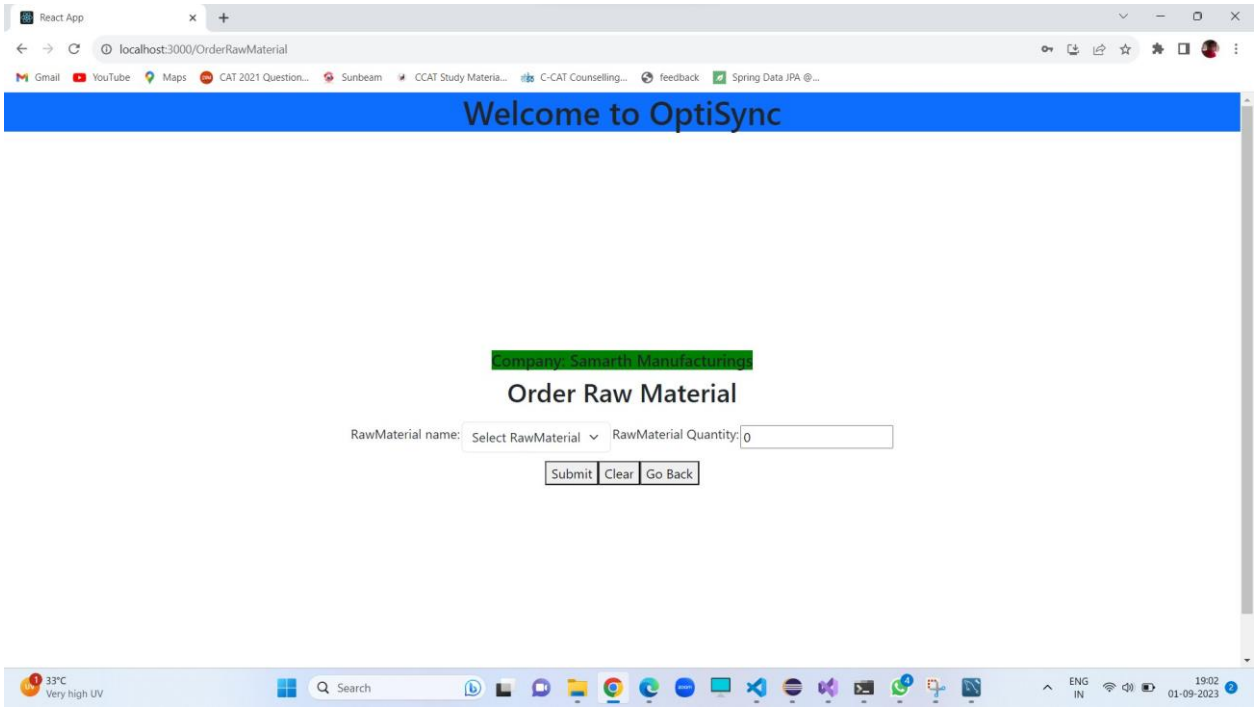
8.7.3 Password Recovery



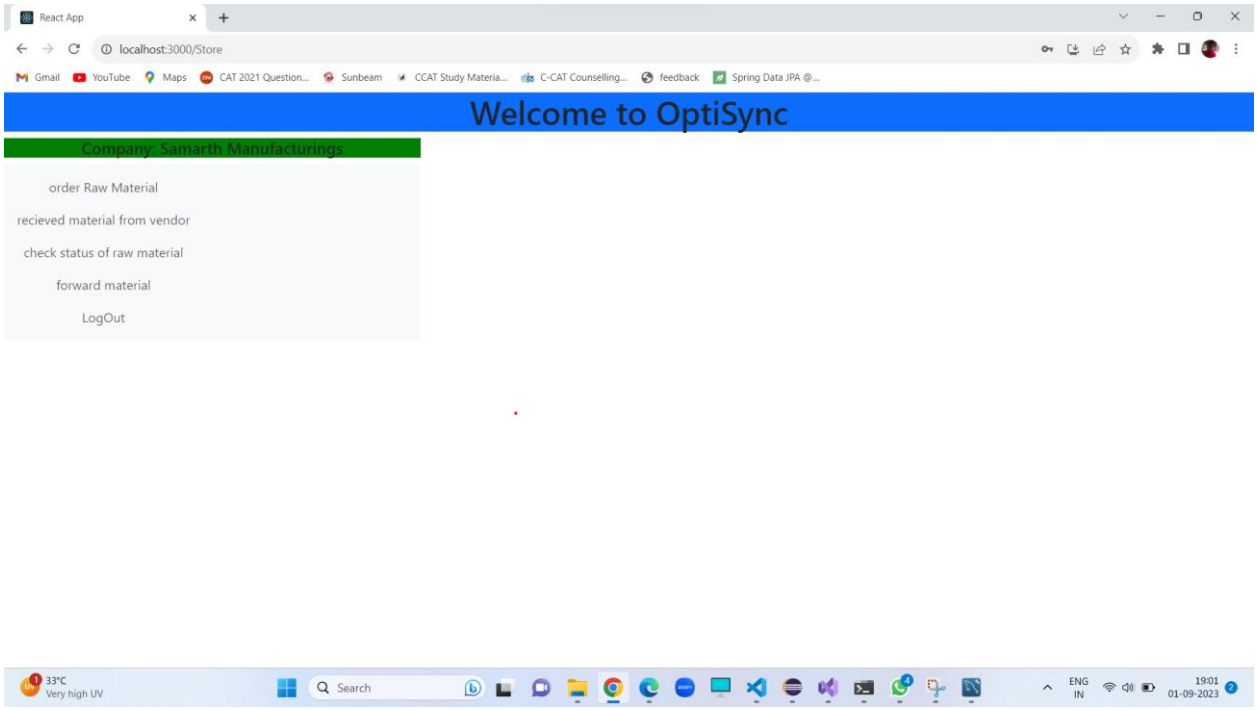
8.8 Store



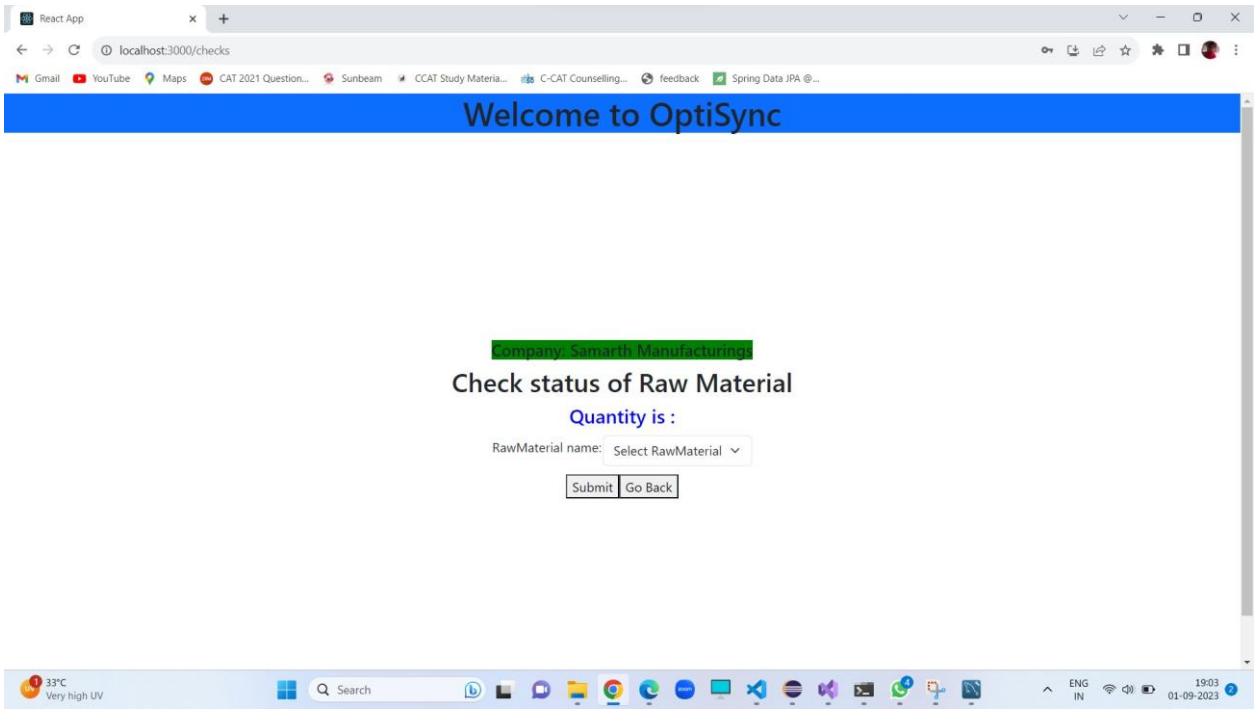
8.8.1 Order Raw Material



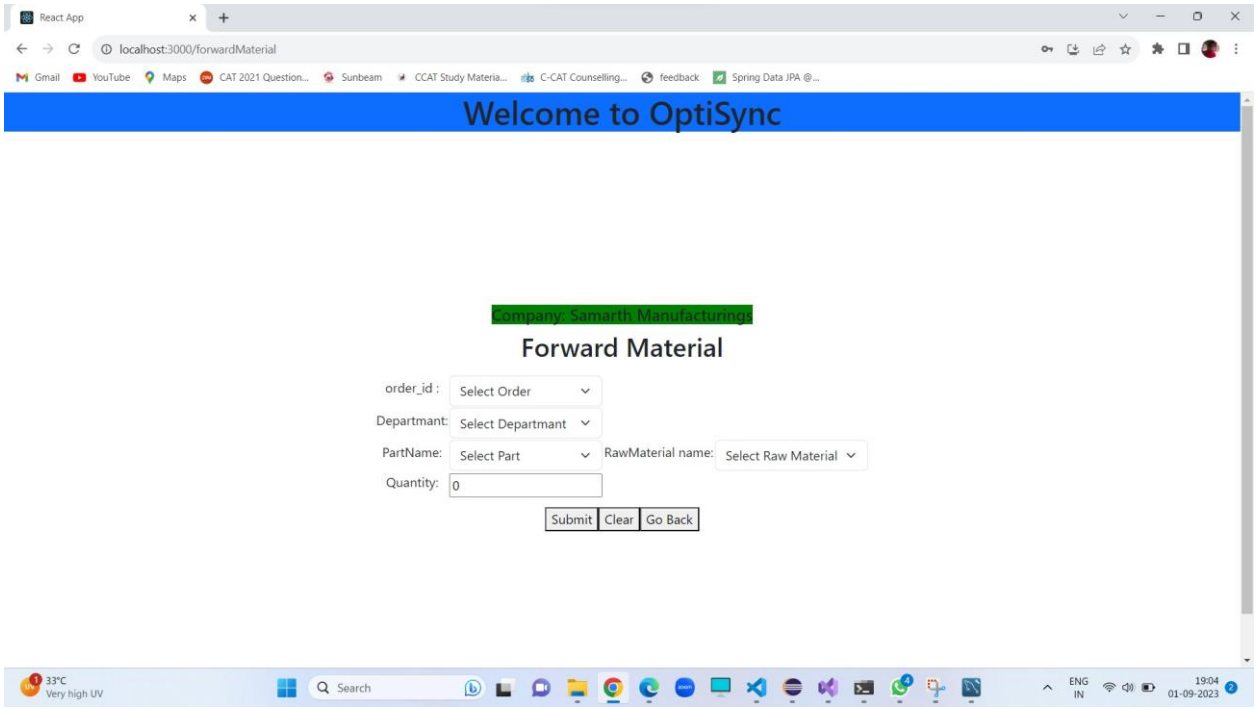
8.8.2 Received material from vendor



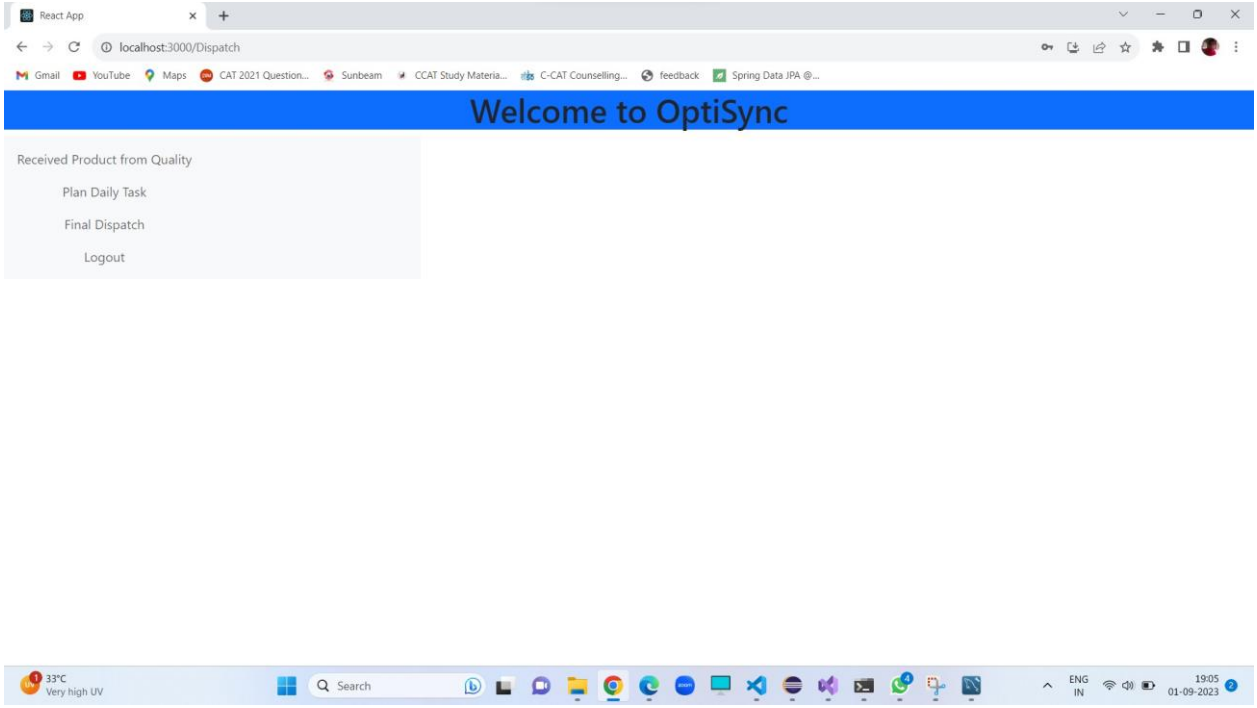
8.8.3 Check raw material status



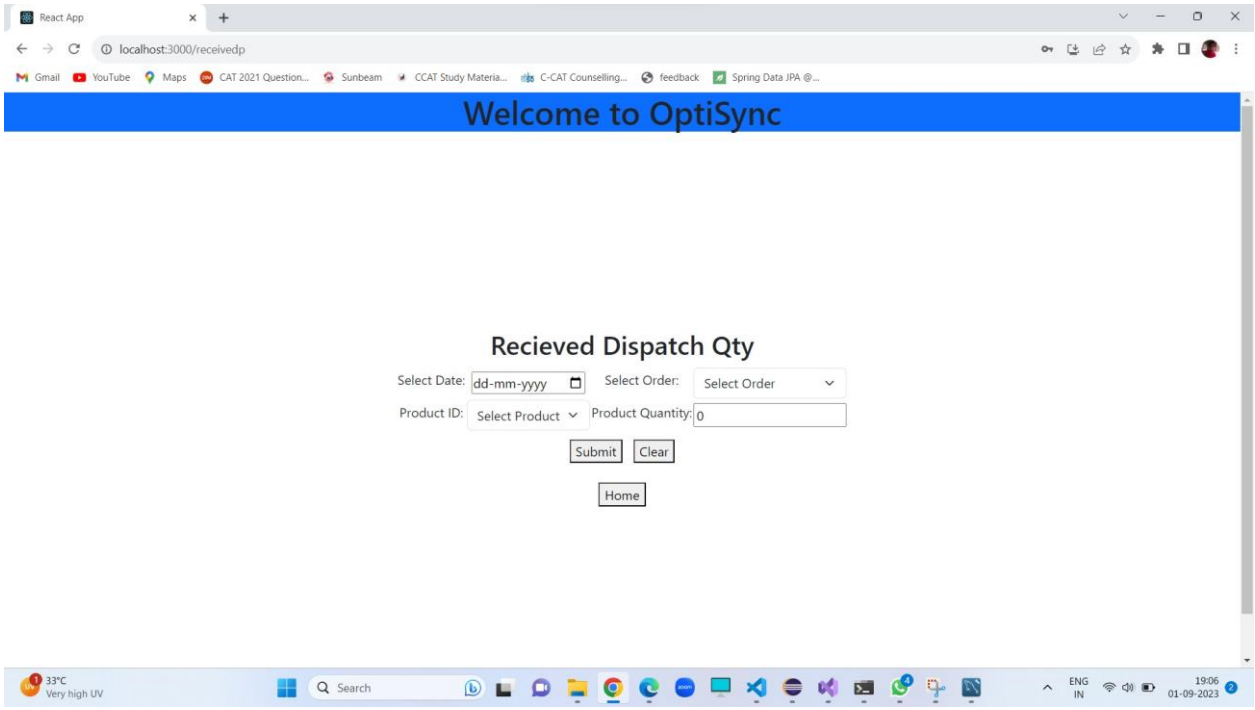
8.8.4 Forward Material



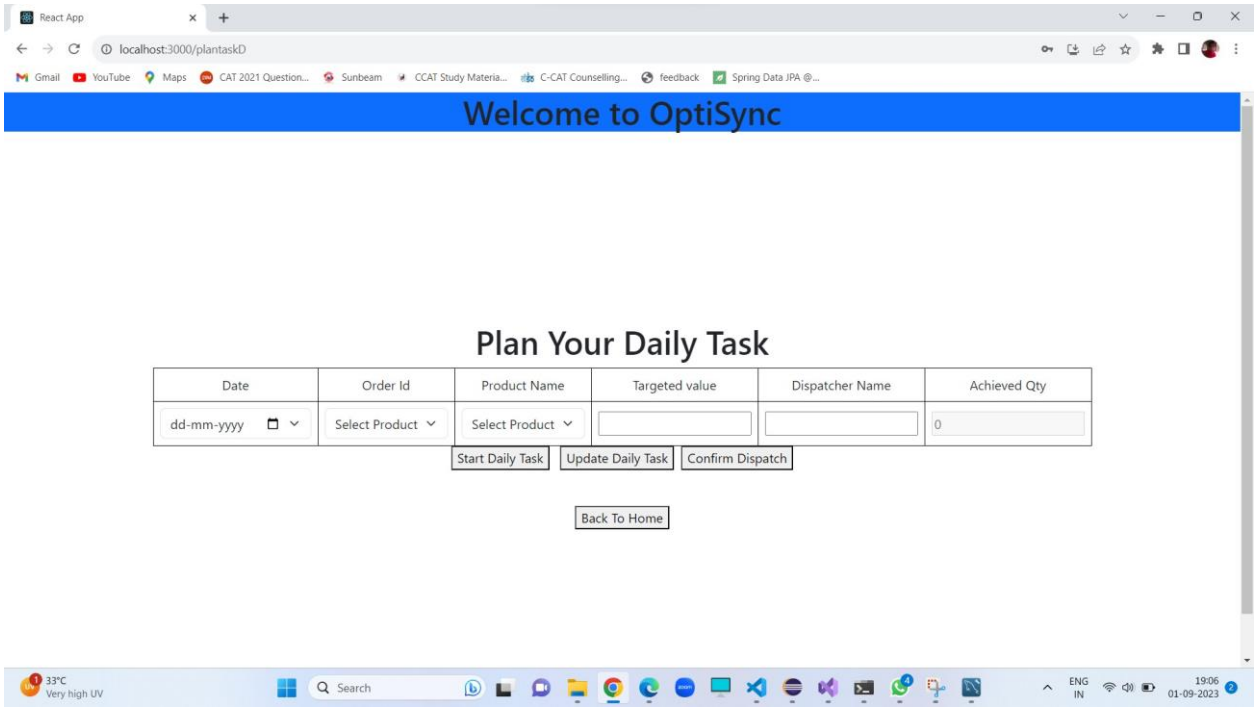
8.9 Dispatch



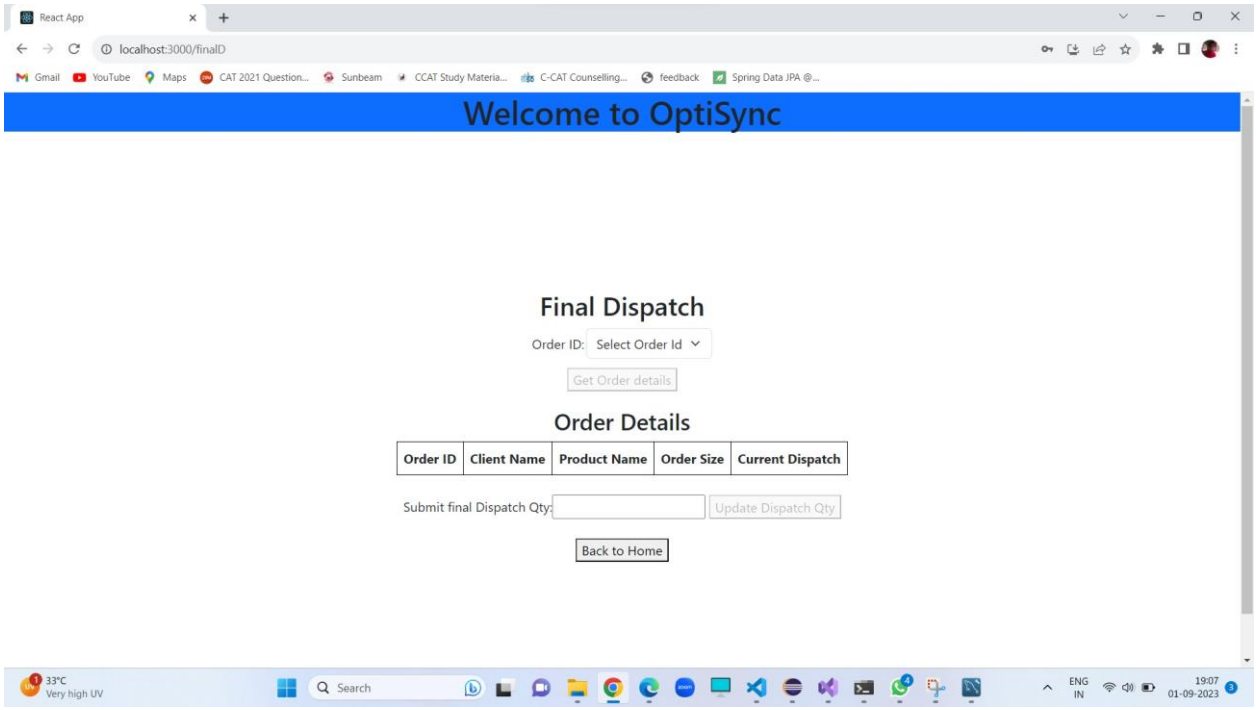
8.9.1 Received Quantity



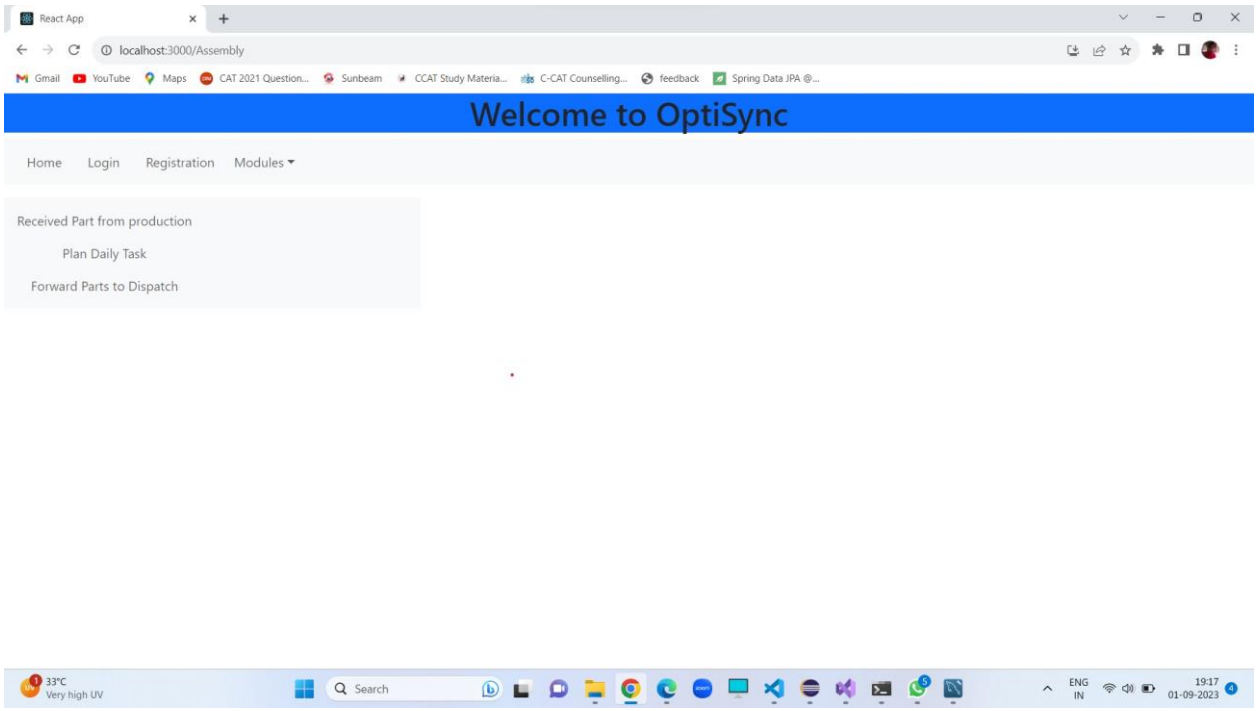
8.9.2 Plan Daily Task



8.9.3 Final Dispatch



8.10 Assembly



9. CONCLUSION AND FUTURE SCOPE

Future Scope: In the future, we can make our project even better by using React JS and Bootstrap together. This will help us improve how the project looks and how users interact with it. We can make the project more attractive and easier to use by enhancing the designs and adding interactive elements.

Also, we can work on the important parts of the project to make them work even smarter. By using Spring Boot and React more, we can add advanced features that help us make better decisions and do things more efficiently. This might include things like predicting future trends, watching how things are doing in real-time, and making some tasks happen automatically based on things we've done before.

So, in the end, the future of our project is about using React JS, Spring Boot, and MySQL to make things look and work better. And by focusing on the important parts, we can use technology to make our project not only handle what it does now but also help us do things even better in the future.