Merchant Monetary System

Final Report

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1 Project Description

The system is designed for a company that provides logistics (delivery of products to its client), product management (crud operations), and effective communication with their worker, clients, and vendors.

The company has its office, warehouse, and rider. It has a different contract with multiple firms to take the shipment from the vendors and store it in dedicated warehouses. The rider will take orders from the shopkeeper. Their order is received at the office, and the office will create the feasibility report according to their shopkeepers' needs and instructions generated for their warehouse manager to fulfill their order. The area-specific rider will receive an email about their order. The office will send a confirmation email to their shopkeeper.

There are a total of four actors in the system and two stakeholders. Their titles and roles are:

- **CEO:** The company's owner manages all the operations.
- **Employee:** They are assistants to CEO to help in company operations.
- **Warehouse Manager:** Received the instructions from the employee and ready the shipment for the rider, and managed other expenses.
- **Rider:** They take orders from different shopkeepers and deliver the product according to pre-subscribed routes defined by the system.

The stakeholder is:

- **Shopkeepers:** Getting the goods and services from the company.
- **Vendor:** The vendor will provide the products to the company.

This system is designed for one company and one CEO. CEO will be provided with already defined credentials. The CEO is responsible for creating accounts for all others actors. The CEO will provide a credential to the actors, and they will be able to update their credentials.

The first dedicated dashboard for the CEO, where they monitor all operations. The operations manage their workers, products, and expenses and send emails. The CEO is the only person in the system with access to all operations. CEO analyzes company operations, including the performance of their workers and inventory. The system will present the company expenditure report.

The second dashboard is for office employees. They have access to manage emails, shopkeepers' orders, vendors' shipments, and company expenses. The company's expenses are the CEO, rider, and warehouse salaries. The system will present the report of payment to the vendor and shopkeeper. An employee will enter all the shipments that the company receives. They add product identifiers.

The third dashboard is for the warehouse manager, who receives feasibility reports of office employees and prepares the order for the rider. The warehouse manager must record the labor used in preparing the order. It could provide the miscellaneous expenses of the warehouse, like electricity costs, etc. They can view the product and make suitable changes according to the requirements.

The fourth dashboard is for a rider, which is basically the communicator between the company and the shopkeeper. The rider is responsible for taking orders from the shopkeeper. Enter order details into the system. The riders will check the current orders assigned to them by the company. They will pick up the shipment from the warehouse and delivery them to the shopkeeper. The system will present the routes to the destination with the order detail. The rider

received a specific amount of fuel to perform the operations. The prescribed fuel is calculated according to the formula. They can see all the products. The product will be sorted in any order. Search for a specific product from a wide range of available products. The system will deploy different sharp algorithms to access the desired date orders quickly. Able to place the order and view the detail of the order as well.

The system will present the report to the CEO according to the performance of their workers, expenditures, sales and profit, salaries, inventory report, riders' performance, shopkeeper and vendor payment, workers' report, individual warehouse report, and miscellaneous expenses. Like how many products are received in the warehouse, how many products are left, how many products are delivered to company clients, how many riders have done shipments, which rider performs most shipments, and which rider needs to perform better. It also includes how many orders a shopkeeper placed and whether the company received the payment.

The email notification mechanism is embedded in the system, which helps the company communicate within and outside with other vendors and shopkeepers. After the rider has confirmed the order, the system will send an email to the company. The company will send the order details to the warehouse manager to prepare the shipment for the rider. The rider also received the email for the delivery of the order. The employee emails the CEO for any need of assistance with an issue. The warehouse manager and rider also mail to the company office for any assistance. In external communication, the client will receive a confirmation email from the system about their order. They also take assistance from the company with any issue.

All the data is stored in an effective data structure to extract the data according to the need of the system actor and stakeholder.

2 Project Features

1. CEO is able to manage employees, warehouse manager, rider, and shopkeeper.
2. CEO and Employee manage product-related operations.
3. CEO will be able to analyze company operations.
4. Warehouse manager readies the shipment for the rider.
5. Rider delivered the shipment to their shopkeeper.
6. Riders are able to select the shortest route to reach the destination.
7. One user is able to notify other users through email.
8. Riders are able to view products and place an order.
9. System presents different reports that will be generated.

3 Technology Stack

The system is designed, developed, and tested in a desktop application. The system used the following language, packages, and an Integrated development environment.

Table 1: Details of technology used in the system. The version number is enclosed in brackets

Language	C # (7.3)
Framework	.Net framework (4.7.2)
IDE	Microsoft Visual Studio 2022
Packages	Dynamic Language Runtime (1.3.3), Entity Framework (6.4.4), GMap.NET.Windows (2.1.7), Microsoft.CSharp (4.7.0), Newtonsoft.Json (13.0.1), Stub.System.Data.SQLite.Core.NetFramework (1.0.115.5), System.Buffers (4.5.1), System.Data.SqlClient (4.8.3) System.Data.SQLite (1.0.115.5) System.Memory (4.5.5) System.Numerics.Vectors (4.5.0) System.Reflection.Emit (4.3.0) System.Runtime.CompilerServices.Unsafe (4.5.3) System.Security.Principal.Windows (5.0.0)

System Requirement

Table 2: To run Merchant Monetary System, your computer must meet the minimum technical specifications outlined below. For optimum performance, use recommended system specifications.

Processor	Multicore Intel® or AMD processor (2 GHz or faster processor with SSE 4.2 or later) with 64-bit support
Operating system	Windows 8
RAM	4 GB
Monitor resolution	1280 x 800 display at 100
Hard disk space	1 GB of available hard-disk space
Internet	An active Internet connection is required to find the routes on map.

4 Project Actors

There are a total of four actors in the system and two stakeholders. Their titles and roles are:

- **CEO:** The company's owner manages all the operations.
- **Employee:** They are assistants to CEO to help in company operations.
- **Warehouse Manager:** Received the instructions from the employee and ready the shipment for the rider, and managed other expenses.
- **Rider:** They take orders from different shopkeepers and deliver the product according to pre-subscribed routes defined by the system.

The stakeholders are:

- **Shopkeeper:** Getting the goods and services from the company.
- **Vendor:** The vendor will provide the products to the company.

5 Use Cases

Use Case 1:Log In

Use Case ID	U01
Name	Login
Actor	CEO, Employee, Rider, Warehouse Manager
Description	The login screen will be presented. The actor will select theor role and enter their username and password. And click on the login button. The system will check for its validity. The system will present the respective dashboard.
Pre-Condition	The respective actor will initiate the system, and the login in form is presented.

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Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to take identifiers. 2. Actor selects his/her role from the given list. 3. Actor enters his/her username. 4. Actor enters his/her password. 5. Actor clicks on the login button. Extensions (or Alternative Flows): *a. If forgot password button is clicked 1. U02 will initiate *b. If the exit button is clicked 1. System will close 2a. If the actor doesn't select his/her role. 1. Error Signal will be present. 3a. If the actor doesn't enter his/her username. 1. Error Signal will be present. 4a. If the actor doesn't enter his/her password. 1. Error Signal will be present. 5a. if the selected role doesn't exist with existing data 1. Error Signal will be present. 5b. if the entered username doesn't exist with existing data 1. Error Signal will be present. 5c. if the entered password doesn't exist with existing data 1. Error Signal will be present.
Post-Condition	Respective Dashboard will be presented

Use Case 2:Forgot Password

Use Case ID	U02
Name	Forgot Password

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Actor	CEO, Employee, Rider, Warehouse Manager
Description	Already registered users can change their password. The actor selects their role and enters his username and password. Then the actor confirms their password and clicks on Update Button; their password will be changed.
Pre-Condition	User must be registered in the system. Forgot Password screen is presented.
Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to enter the identifiers. 2. Actor selects his/her role from the given list. 3. Actor enters his/her username. 4. Actor enters his/her password. 5. Actor confirms his/her password. 6. Actor clicks on the Update button. Extensions (or Alternative Flows): *a. If forgot password button is clicked 1. U02 will initiate *b. If the reset button is clicked 1. All fields will get cleared. 2a. If the actor doesn't select his/her role. 1. Error Signal will be presented. 3a. If the actor doesn't enter his/her username. 1. Error Signal will be present. 4a. If the actor doesn't enter his/her password. 1. Error Signal will be present. 5a. if the selected role doesn't exist with in existing data 1. Error Signal will be present. 5b. if the entered username doesn't exist with in existing data 1. Error Signal will be present.

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Flow	5c. if the entered password doesn't exist with in existing data 1. Error Signal will be present. 5d. if the password doesn't match the password that the user confirmed 1. Error Signal will be present.
Post-Condition	Actor's Password Updated

Use Case 3:Detail of Accounts for CEO

Use Case ID	U03
Name	Detail of Account for CEO
Actor	CEO
Description	CEO can view the details of each user who have registered themselves on this system. CEO can filter out users with certain designations and certain attributes and can apply multiple filters to search out specific users and their data. CEO can delete as well as edit users.
Pre-Condition	Detail of Accounts Screen is presented.
Flow	Main Scenario: 1. CEO selects the designation from the given list. 2. CEO selects the attribute from the given list. 3. CEO could search the data from the identifier. 4. CEO selects the filters from the given list. 5. CEO clicks on the Go button. 6. CEO selects the data(any row shown in the grid)from the grid. 7. CEO clicks on the Edit button, and a new Edit user screen opens. 8. CEO clicks on the Delete button. 9. CEO clicks on the Close button. Extensions (or Alternative Flows): 1. If CEO did not select any designation from the drop-down.

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	1. Error Signal will be present. 2. If CEO did not select any attribute from the drop-down. 1. Error Signal will be present. 3a. If CEO did not select any designation and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 3b. If CEO did not select any Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 3c. If CEO did not select any designation and Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 4a. If CEO did not select any Filter from the given list 1. No operation of the filter is applied to the data. 4b. If CEO did not select any Attribute from the given list and select any filter 1. No operation of the filter is applied to the data. 5a. If CEO did not select any Attribute, Designation, or filter from the given list and not enter the data to be searched in identifier 1. Error Message box will be shown. 6. If CEO did not select any data from the grid list. 1. No operation is performed.
	7. If CEO did not select any data from the grid list and clicked the edit button.

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Flow	1. No operation I performed on any data list in the grid. 2. Message Box will be shown. 8. If CEO did not select any data from the grid list and clicked the delete button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown.
Post-Condition	Data from selected row will be deleted or updated

Use Case 4:Detail of Accounts for Employee

Use Case ID	U04
Name	Detail of Account for Employee
Actor	Employee
Description	Employee can view the details of each user who have registered themselves on this system. Employee can filter out users with certain designations and certain attributes and can apply multiple filters to search out specific users and their data. Employee can delete as well as edit users.
Pre-Condition	Detail of Accounts Screen is presented.

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Flow	Main Scenario: 1. Employee selects the designation from the given list. 2. Employee selects the attribute from the given list. 3. Employee could search the data from the identifier. 4. Employee selects the filters from the given list. 5. Employee clicks on the Go button. 6. Employee selects the data(any row shown in the grid)from the grid. 7. Employee clicks on the Edit button, and a new Edit user screen opens. 8. Employee clicks on the Delete button. 9. Employee clicks on the Close button.
	Extensions (or Alternative Flows): 1. If Employee did not select any designation from the drop-down. 1. Error Signal will be present. 2. If Employee did not select any attribute from the drop-down. 1. Error Signal will be present. 3a. If Employee did not select any designation and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 3b. If Employee did not select any Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 3c. If Employee did not select any designation and Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 4a. If Employee did not select any Filter from the given list

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	1. No operation of the filter is applied to the data. 4b. If Employee did not select any Attribute from the given list and select any filter 1. No operation of the filter is applied to the data. 5a. If Employee did not select any Attribute, Designation, or filter from the given list and not enter the data to be searched in identifier 1. Error Message box will be shown. 6. If Employee did not select any data from the grid list. 1. No operation is performed. 7. If Employee did not select any data from the grid list and clicked the edit button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown. 8. If Employee did not select any data from the grid list and clicked the delete button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown.
Post-Condition	Data from selected row will be deleted and a dashboard will be presented

Use Case 5:SignUp

Use Case ID	U05
Name	SignUp
Actor	CEO, Employee

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Description	Actor select the designation of the worker from the given list, name, username, password, CNIC number, gender, contact number, email address, and home address.
Pre-Condition	The system presents the SignUp screen
Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to create the identifiers. 2. Actor selects the designation of the worker from the given list. 3. Actor enters worker name. 4. Actor enters worker's password. 5. Actor confirms the entered password. 6. Actor enters worker's CNIC number. 7. Actor enters worker gender. 8. Actor enters worker contact number. 9. Actor enters worker's email address. 10. Actor enters worker's home address. 11. If the designation is rider, then select the vehicle from the list. 12. Actor clicks on the create account button, and the system sends an email. Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 3a. If the actor doesn't enter the worker's name 1. Error Signal will be present. 3b. If the actor enters an invalid worker's name 1. Error Signal will be present. 4a. If the actor doesn't enter the worker's username

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	1. Error Signal will be present. 5a. If the actor doesn't enter the worker's password 1. Error Signal will be present. 5b. If the actor enters an invalid worker's password 1. Error Signal will be present. 6a. If the actor enters the worker's password does not match the previously entered password 1. Error Signal will be present. 7a. If the actor doesn't enter the worker's CNIC number 1. Error Signal will be present. 7b. If the actor enters invalid the worker's CNIC number 1. Error Signal will be present. 9a. If the actor doesn't enter the worker's contact number 1. Error Signal will be present. 9b. If the actor enters invalid the worker's contact number 1. Error Signal will be present. 10a. If the actor doesn't enter the worker's email address 1. Error Signal will be present. 10b. If the actor enters invalid the worker's email address 1. Error Signal will be present. 11a. If the actor doesn't enter the worker's home address

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	1. Error Signal will be present.
Post-Condition	The account information is stored in the database, and the screen will be closed.

Use Case 6:Update Account Information by CEO

Use Case ID	U06
Name	Update Account Information by CEO
Actor	CEO
Description	CEO could change the designation of their worker from the given list of designation, name, username, password, CNIC number, gender, contact number, email address, and home address.
Pre-Condition	The Updated Account Information screen is presented. The registered account information of the actors in the system will be presented in the identifiers.
Flow	Main Success Scenario (or Basic Flow): 1. CEO is ready to update the identifiers. 2. CEO selects the designation of the worker from the given list to change their role. 3. CEO changes their or worker's name. 4. CEO changes their or worker's username. 5. CEO changes their or worker's password. 6. CEO confirms the entered password. 7. CEO changes their or worker's CNIC number. 8. CEO changes their or worker's gender. 9. CEO changes their or worker's contact number. 10. CEO changes their or worker's email address. 11. CEO changes their or worker's home address. 12. CEO changes the vehicle from the given list. 13. CEO clicked on the update account button and the system sends an email. Extensions (or Alternative Flows):

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	*a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 3a. If the CEO doesn't enter their or the worker's name 1. Error Signal will be present. 3b. If the CEO enters invalid their or the worker's name 1. Error Signal will be present. 4a. If the CEO doesn't enter their or the worker's username 1. Error Signal will be present. 5a. If the CEO doesn't enter their or the worker's password 1. Error Signal will be present. 5b. If the CEO enters invalid their or the worker's password 1. Error Signal will be present. 6a. If the CEO enter their or the worker's password does not match the previously entered password 1. Error Signal will be present. 7a. If the CEO doesn't enter their or the worker's CNIC number 1. Error Signal will be present. 7b. If the CEO enters invalid their or the worker's CNIC number 1. Error Signal will be present. 9a. If the CEO doesn't enter their or the worker's contact number

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	1. Error Signal will be present. 9b. If the CEO enters invalid their or the worker's contact number 1. Error Signal will be present. 10a. If the CEO doesn't enter their or the worker's email address 1. Error Signal will be present. 10b. If the CEO enters invalid their or the worker's email address 1. Error Signal will be present. 11a. If the CEO doesn't enter their or the worker's home address 1. Error Signal will be present.
Post-Condition	The account information is updated in the database, and the screen will be closed.

Use Case 7:Update Account Information by Employee

Use Case ID	U07
Name	Update Account Information by Employee
Actor	Employee
Description	employee could change the designation of the company workers (except there and the CEO) from the given list of designation, name, username, password, CNIC number, gender, contact number, email address, and home address.
Pre-Condition	The Updated Account Information screen is presented. The registered account information of the actors in the system will be presented in the identifiers.

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Flow	Main Success Scenario (or Basic Flow): 1. Employee is ready to update the identifiers. 2. Employee selects the designation of the worker from the given list to change their role. 1. Employee changes worker name. 2. Employee changes worker's password. 3. Employee confirms the entered password. 4. Employee changes worker's CNIC number. 5. Employee changes worker gender. 6. Employee changes worker contact number. 7. Employee changes worker's email address. 8. Employee changes worker's home address. 9. Employee changes the vehicle from the given list. 10. Employee clicked on the update account button and the system sends an email. Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 3a. If the employee doesn't enter the worker's name 1. Error Signal will be present. 3b. If the employee enters an invalid worker's name 1. Error Signal will be present. 5a. If the employee doesn't enter the worker's password

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	1. Error Signal will be present. 5b. If the employee enters an invalid worker's password 1. Error Signal will be present. 6a. If the employee enters the worker's password does not match the previously entered password 1. Error Signal will be present. 7a. If the employee doesn't enter the worker's CNIC number 1. Error Signal will be present. 7b. If the employee enters invalid the worker's CNIC number 1. Error Signal will be present. 9a. If the employee doesn't enter the worker's contact number 1. Error Signal will be present. 9b. If the employee enters invalid the worker's contact number 1. Error Signal will be present. 10a. If the employee doesn't enter the worker's email address 1. Error Signal will be present. 10b. If the employee enters invalid the worker's email address 1. Error Signal will be present. 11a. If the employee doesn't enter the worker's home address 1. Error Signal will be present.
Post-Condition	The account information is updated in the database, and the screen will be closed.

Use Case 8:Add Products

Use Case ID	U08
Name	Add Products
Actor	CEO, Employee
Description	Vendor arrives at the company with a new product. The respective actor adds the product name, weight, and volume and selects a category, vendor, and sensitivity type from the list. Then the actor clicks on Add button.
Pre-Condition	New Product arrives, and the CEO or Employee wants to add them into the system. The Add Product Form will be presented.
Flow	Main Scenario: 1. Actor is ready to add product. 2. Product ID will automatically be generated. 3. Actor enters Product Name. 4. Actor selects a category from the given list. 5. Actor selects the vendor of the product from the given list. 6. Actor enters the weight of each product. 7. Actor enters the volume of each product. 8. Actor selects product's sensitivity type. 9. Actor clicks on Add Button. Extensions (or Alternative Flows): *a. If the Back button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked

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	1. All fields will get cleared. 3a. If the actor doesn't enter the product name. 1. Error Signal will be presented. 4a. If the actor doesn't select a category. 1. Error Signal will be present. 5a. If the actor doesn't select a vendor. 1. Error Signal will be present. 6a. If the actor doesn't enter the weight of the product. 1. Error Signal will be presented. 6b. If the actor enters the invalid weight of the product, i.e., type string while entering weight. 1. Error Signal will be presented. 7a. If the actor doesn't enter the volume of the product. 1. Error Signal will be presented. 7b. If the actor enters the invalid volume of the product, i.e., type string while entering volume. 1. Error Signal will be presented.
Post-Condition	A new product info will be added to system

Use Case 9:Update Products

Use Case ID	U09
Name	Update Products
Actor	CEO, Employee
Description	Updation Required for product details. The actor updates the identifiers where required and clicks on the Update Button. Details of the product will be updated in the system.
Pre-Condition	Updation Required for Product Details. An update product screen will be presented. All fields are filled according to the existing details.

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Flow	Main Scenario: 1. Actor is ready to update product identifiers. 2. Product ID is automatically disabled and non-editable. 3. Actor updates Product Name. 4. Actor updates a category. 5. Actor updates the vendor of the product. 6. Actor updates the weight of each product. 7. Actor updates the volume of each product. 8. Actor updates product's sensitivity type. 9. Actor clicks on the Update Button. Extensions (or Alternative Flows): *a. If the Back button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked 1. All fields will get cleared. 3a. If the actor doesn't enter the product name. 1. Error Signal will be presented. 6a. If the actor doesn't enter the weight of the product. 1. Error Signal will be presented. 6b. If the actor enters the invalid weight of the product, i.e., type string while entering weight. 1. Error Signal will be presented. 7a. If the actor doesn't enter the volume of the product. 1. Error Signal will be presented. 7b. If the actor enters the invalid volume of the product, i.e., type string while entering volume. 1. Error Signal will be presented.
Post-Condition	The product with updated details will be added to the system.

Use Case 10:Detail of Products

Use Case ID	U10
Name	Detail of Products
Actor	CEO,Employee
Description	Actor can view the details of each product that registered on this system. Actor can filter out products with certain attributes and can apply multiple filters to search out specific users and their data. Actor can delete as well as edit products.
Pre-Condition	Detail of Products Screen will be presented.
Flow	Main Scenario: 1. Actor selects the attribute from the given list. 2. Actor could search the data from the identifier. 3. Actor selects the filters from the given list. 4. Actor clicks on the Go button. 5. Actor selects the data(any row shown in the grid)from the grid. 6. Actor clicks on the Edit button, and a new Edit user screen opens. 7. Actor clicks on the Delete button. 8. Actor clicks on the Close button.
	Extensions (or Alternative Flows): 1. If Actor did not select any attribute from the drop-down. 1. Error Signal will be present. 2a. If Actor did not select any Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 2b. If Actor did not select any designation and Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 3a. If Actor did not select any Filter from the given list

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	1. No operation of the filter is applied to the data. 3b. If Actor did not select any Attribute from the given list and select any filter 1. No operation of the filter is applied to the data. 4a. If Actor did not select any Attribute, Designation, or filter from the given list and not enter the data to be searched in identifier 1. Error Message box will be shown. 5. If Actor did not select any data from the grid list. 1. No operation is performed. 6. If Actor did not select any data from the grid list and clicked the edit button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown. 7. If Actor did not select any data from the grid list and clicked the delete button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown.
Post-Condition	Data from selected row will be deleted and a dashboard will be presented

Use Case 11:Add Category

Use Case ID	U11
Name	Add Category
Actor	CEO, Employee

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Description	Adding a category for a product will initiate with Add Category screen. The respective actor adds a category name and clicks on Add Button. The category is added to the system.
Pre-Condition	Add Category screen will be presented.
Flow	Main Scenario: 1. Actor is ready to enter identifier. 2. Actor enters the category name 3. Actor clicks on the Add Button. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked 1. Category identifier will get cleared. 2a. Actor doesn't enter the category name. 1. Error Signal will be presented. 2b. Actor enters the invalid category, i.e., integer instead of string 1. Error Signal will be presented.
Post-Condition	The Category will be added to the system.

Use Case 12:Update Category

Use Case ID	U12
Name	Update Category
Actor	CEO, Employee
Description	Updating a category will initiate with the Update Category screen. The respective Actor updates the category name and clicks on the Update Button. The category is updated.
Pre-Condition	Update Category screen will be presented and the identifier is already filled with previously entered category

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Flow	Main Scenario: 1. Actor is ready to update identifier. 2. Actor updates the category name 3. Actor clicks on the Update Button. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked 1. Category identifier will get cleared. 2a. Actor doesn't enter the category name. 1. Error Signal will be presented. 2b. Actor enters the invalid category, i.e., integer instead of string 1. Error Signal will be presented.
Post-Condition	The Category will be updated and added to the system.

Use Case 13:Add Vendor

Use Case ID	U13
Name	Add Vendor
Actor	CEO, Employee
Description	The respective actors will add the manufacturer or vendor details by entering the details, e.g., its name, address, landline number, concerned person, and contact. Then click on Add Button. Now you have a new vendor for your company
Pre-Condition	Add Vendor screen will be presented to the respective actors.

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Flow	Main Scenario: 1. Actor is ready to enter the identifiers. 2. Actor enters vendor name. 3. Actor enters vendor's landline number. 4. Actor enters vendor's address. 5. Actor enters the concerned person's name. 6. Actor enters the concerned person's contact number. 7. Actor clicks on Add button. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked

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	1. All identifiers will get cleared. 2a. Actor doesn't enter the vendor's name. 1. Error Signal will be presented. 3a. Actor doesn't enter the vendor's landline number. 1. Error Signal will be presented. 4a. Actor doesn't enter the vendor's address. 1. Error Signal will be presented. 5a. Actor doesn't enter the concerned person's name. 1. Error Signal will be presented. 6a. Actor doesn't enter the concerned person's contact number. 1. Error Signal will be presented. 7a. Actor enters the invalid landline number, i.e., string instead of numbers 1. Error Signal will be presented. 7b. Actor enters the invalid concerned person's number, i.e., string instead of numbers 1. Error Signal will be presented.
Post-Condition	Vendor details will be added to the system.

Use Case 14:Update Vendor

Use Case ID	U14
Name	Update Vendor
Actor	CEO, Employee
Description	The respective actors will update the manufacturer or vendor details by initiating the Update vendor screen. Update the details of your own choice and then click on Update Button. Vendor details have been updated.
Pre-Condition	Update Vendor screen will be presented to the respective actors, and existing details are already filled in the identifiers fields.

Table 16 – *Continued on next page*

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Flow	Main Scenario: 1. Actor is ready to update the identifiers. 2. Actor updates vendor name. 3. Actor updates vendor's landline number. 4. Actor updates the vendor's address. 5. Actor updates the concerned person's name. 6. Actor updates the concerned person's contact number. 7. Actor clicks on Add button. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked

Table 16 – *Continued on next page*

Table 16 – *Continued from previous page*

	1. All identifiers will get cleared. 2a. Actor doesn't enter the vendor's name. 1. Error Signal will be presented. 3a. Actor doesn't enter the vendor's landline number. 1. Error Signal will be presented. 4a. Actor doesn't enter the vendor's address. 1. Error Signal will be presented. 5a. Actor doesn't enter the concerned person's name. 1. Error Signal will be presented. 6a. Actor doesn't enter the concerned person's contact number. 1. Error Signal will be presented. 7a. Actor enters the invalid landline number, i.e., string instead of numbers 1. Error Signal will be presented. 7b. Actor enters the invalid concerned person's number, i.e., string instead of numbers 1. Error Signal will be presented.
Post-Condition	Vendor details will be updated and added to the system.

Use Case 15:Add Stock

Use Case ID	U15
Name	Add Stock
Actor	CEO, Employee
Description	Stock of added products will now add. Initiate Add Stock screen and add identifiers. Select product; enters quantity retail price and cost price, and select expiry manufacturing and date of stock add. then click on Add button. Stock will be added.
Pre-Condition	Add Stock screen will be presented to the respective actor.

Table 17 – *Continued on next page*

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Flow	Main Scenario: 1. Actor is ready to enter the stock. 2. Actor selects the product from the given list. 3. Actor enters the product quantity. 4. Actor enters the Retail Price. 5. Actor enters the Cost Price. 6. Actor selects the date of the stock added. 7. Actor selects the manufacturing date of the stock. 8. Actor selects the expiry date of the stock. 9. Actor clicks on Add button. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked

Table 17 – *Continued on next page*

Table 17 – *Continued from previous page*

	1. All identifiers will get cleared. 2a. actor doesn't enter the vendor's name. 1. Error Signal will be presented. 3a. if the actor enters string instead of integers. 1. Error Signal will be presented. 3b. if the actor enters a negative quantity. 1. Error Signal will be presented. 4a. if the actor enters a string instead of a number. 1. Error Signal will be presented. 4b. if the actor enters a negative number. 1. Error Signal will be presented. 5a. if the actor enters a string instead of a number. 1. Error Signal will be presented. 5b. if the actor enters a negative number. 1. Error Signal will be presented. 9a. If the manufacturing date is greater than the expiry date 1. Error Signal will be presented. 9b. If the manufacturing date is greater than the current date 1. Error Signal will be presented. 9c. If the expiry date is less than the current date 1. Error Signal will be presented.
Post-Condition	Stock of the product will be added.

Use Case 16:Add WareHouse

Use Case ID	U16
Name	Add WareHouse
Actor	CEO,Employee

Table 18 – *Continued on next page*

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Description	. The respective actor adds the warehouse name, area, city, state, and capacity volume. Then the actor clicks on Next button.
Pre-Condition	Add WareHouse Screen will be presented.
Flow	Main Scenario: 1. Actor is ready to add wareHouse. 2. Actor enters WareHouse Name. 3. Actor selects the area of wareHouse. 4. Actor selects the city of wareHouse. 5. Actor selects the state of wareHouse. 6. Actor enters the capacity volume of wareHouse. 7. Actor clicks on Next Button. Extensions (or Alternative Flows): 2a. If Actor did not enter the wareHouse name. 1. Error Signal will be present. 2b. If Actor enter invalid characters in the wareHouse name. 1. Error Signal will be present. 2c. If Actor enter inproper data(single alphabet etc) in the wareHouse name. 1. Error Signal will be present. 2d. If Actor enter digits in the wareHouse name. 1. Error Signal will be present. 3. If Actor did not select any area from the drop-down. 1. Error Signal will be present. 4. If Actor did not select any city from the drop-down. 1. Error Signal will be present.

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	5. If Actor did not select any state from the drop-down. 1. Error Signal will be present. 6a. If Actor did not enter capacity volume from the drop-down. 1. Error Signal will be present. 6b. If Actor enter invalid characters in the wareHouse capacity. 1. Error Signal will be present. 6c. If Actor enter inproper data(alphabets, negative values etc) in the wareHouse capacity. 1. Error Signal will be present.
Post-Condition	after clicked next button new form of Add WareHouse Manager will be presented.

Use Case 17:Update WareHouse

Use Case ID	U17
Name	Add WareHouse
Actor	CEO,Employee
Description	. The respective actor can edit the warehouse name, area, city, state, and capacity volume.
Pre-Condition	Edit WareHouse Screen will be presented.
Flow	Main Scenario: 1. Actor is ready to edit wareHouse. 2. Actor edits WareHouse Name. 3. Actor edits the area of wareHouse. 4. Actor edits the city of wareHouse. 5. Actor edits the state of wareHouse. 6. Actor updates the capacity volume of wareHouse. 7. Actor clicks on Next Button.

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	Extensions (or Alternative Flows): 2a. If Actor did not enter the wareHouse name. 1. Error Signal will be present. 2b. If Actor enter invalid characters in the wareHouse name. 1. Error Signal will be present. 2c. If Actor enter inproper data(single alphabet etc) in the wareHouse name. 1. Error Signal will be present. 2d. If Actor enter digits in the wareHouse name. 1. Error Signal will be present. 3. If Actor did not select any area from the drop-down. 1. Error Signal will be present. 4. If Actor did not select any city from the drop-down. 1. Error Signal will be present. 5. If Actor did not select any state from the drop-down. 1. Error Signal will be present. 6a. If Actor did not enter capacity volume from the drop-down. 1. Error Signal will be present. 6b. If Actor enter invalid characters in the wareHouse capacity. 1. Error Signal will be present. 6c. If Actor enter inproper data(alphabets, negative values etc) in the wareHouse capacity.

Table 19 – *Continued on next page*

Table 19 – *Continued from previous page*

	1. Error Signal will be present.
Post-Condition	Dashboard will be presented.

Use Case 18:View WareHouse

Use Case ID	U18
Name	Detail of WareHouses
Actor	CEO,Employee
Description	Actor can view the details of each WareHouse that registered on this system. Actor can filter out WareHouses with certain attributes and can apply multiple filters to search out specific wareHouse and their data. Actor can delete as well as edit wareHouses.
Pre-Condition	Detail of Accounts Screen is presented.
Flow	Main Scenario: 1. Actor selects the attribute from the given list. 2. Actor could search the data from the identifier. 3. Actor selects the filters from the given list. 4. Actor clicks on the Go button. 5. Actor selects the data(any row shown in the grid)from the grid. 6. Actor clicks on the Edit button, and a new Edit user screen opens. 7. Actor clicks on the Delete button. 8. Actor clicks on the Close button. Extensions (or Alternative Flows): 1. If Actor did not select any attribute from the drop-down. 1. Error Signal will be present. 2a. If Actor did not select any Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute.

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Flow	2b. If Actor did not select any designation and Attribute and entered the data in the identifier to search. 1. The searched data will show from the first attribute. 3a. If Actor did not select any Filter from the given list 1. No operation of the filter is applied to the data. 3b. If Actor did not select any Attribute from the given list and select any filter 1. No operation of the filter is applied to the data. 4a. If Actor did not select any Attribute, Designation, or filter from the given list and not enter the data to be searched in identifier 1. Error Message box will be shown. 5. If Actor did not select any data from the grid list. 1. No operation is performed. 6. If Actor did not select any data from the grid list and clicked the edit button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown. 7. If Actor did not select any data from the grid list and clicked the delete button. 1. No operation I performed on any data list in the grid. 2. Message Box will be shown.
Post-Condition	Data from selected row will be deleted and a dashboard will be presented

Use Case 19:Take Order

Use Case ID	U19
Name	Take Order
Actor	Rider
Description	Rider is now at the shop. The shopkeeper tells the rider about the products which he wants to order. The rider adds the product from the list with the specified quantity to the cart. The process continues until the shopkeeper orders all required products. Then the rider moves toward the Order Summary screen. Selects the shopkeeper from the list. The rider can change the order details. And in the end, click on the Buy button to place the order.
Pre-Condition	Rider has arrived at the shop, and the shopkeeper is giving him the order. Take Order screen is presented.
Flow	Main Scenario: 1. Actor is ready to take the order. 2. Actor recommends different products to the shopkeeper. 3. Actor adds the product to the cart by clicking on Add to Cart button with the shopkeeper's consent and requirement, i.e., the quantity of the shopkeeper's need. 4. The process continues until the shopkeeper orders all required products. 5. Actor clicks on View Cart. 6. Order Summary screen will be presented. 7. Grand Total Amount is shown at the bottom left of the screen. 8. Actor selects the shopkeeper's name from the given list. 9. Actor can update and remove the product from the ordered items list of the shopkeeper. 10. Click on the Buy button at the end of the screen to confirm the order. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the reset button is clicked in the Order Summary screen 1. Ordered items list will get cleared. *c. If the back button is clicked in the Order Summary screen

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	1. Take Order screen will be presented. 3a. if the specified quantity is greater than the available quantity 1. Product will not add 2. Error Signal will be presented. 3b. if the actor enters a negative quantity. 1. Error Signal will be presented. 9a. If the Buy button is clicked with zero items ordered. 1. Error Signal will be presented.
Post-Condition	Order has been placed and is waiting for employee approval. Order status has been set as "Not Confirmed"

Use Case 20:Confirm the Incoming Order

Use Case ID	U20
Name	Confirm the Incoming Order
Actor	Employee
Description	Order has now been placed by the rider and delivered to the employee for confirmation. Actor clicks on Confirm Button. The confirmation includes two things. Again it will check the product's availability in the warehouse and the rider's vehicle capacity. After successful validation, the order status will be changed from "Not Confirmed" to "Confirmed" in the View Order Details screen. The employee will email the warehouse manager and the assigned rider.
Pre-Condition	Order has been received by the employee.

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Flow	Main Scenario: 1. View Orders Details screen will be presented. 2. Actor will click on the Confirm button against the first order. 3. The system will check the product's availability in the warehouse. 4. After Successful availability, a small screen for assigning a rider is presented 5. Select the rider from the list. 6. Check rider's vehicle's capacity and assign. 7. Click on Assign Button, and the control will again shift back to the View Order Details screen. 8. system automatically sends emails to the assigned rider and the warehouse manager. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented. *b. If the remove button is clicked against any item 1. Corresponding order will get removed. *c. If the back button is clicked 1. Actor's respective dashboard will be presented. 4a. if the products ordered are not available in the warehouse 1. Error Signal will be presented. 8a. If the rider's vehicle's capacity is insufficient to carry the order. 1. Assign button is disabled.
Post-Condition	Order is confirmed now and the warehouse manager is notified about the order.

Use Case 21:Add Vehicle

Use Case ID	U21
Name	Add Vehicle
Actor	CEO, Employee
Description	Actor select the type of vehicle from the given list, enter the capacity in volume, capacity in weight, and registration number, and click on add button to save data in the database .
Pre-Condition	Add vehicle screen is presented.
Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to enter the identifiers , 2. Actor, select the vehicle type from the given list. 3. Actor enters the capacity of the vehicle in volume. 4. Actor enters the capacity of the vehicle in weight. 5. Actor enters the registration number. 6. Actor clicks on the add button. Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 3a. If the actor doesn't enter the capacity in capacity in volume 1. Error Signal will be present. 3b. If the actor enters an invalid capacity in volume 1. Error Signal will be present. 4a. If the actor doesn't enter the capacity in capacity in weight 1. Error Signal will be present. 4b. If the actor enters an invalid capacity in wight 1. Error Signal will be present. 5a. If the actor doesn't enter the capacity in registration number

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	1. Error Signal will be present. 5b. If the actor enters an invalid capacity in registration number 1. Error Signal will be present. 6a.If the entered data is not stored in the database 1. Error Signal will be present.
Post-Condition	Data stored in the database and screen closed.

Use Case 22:Update Vehicle Information

Use Case ID	U22
Name	Update Vehicle Information
Actor	CEO, Employee
Description	Actor select the type of vehicle from the given list, enter the capacity in volume, capacity in weight, and registration number, and click on add button to save data in the database .
Pre-Condition	Update Vehicle Information is presented, and registered information is displayed in the identifiers
Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to update the identifiers. 2. Actor changes the vehicle type from the given list. 3. Actor updates the capacity of the vehicle in volume. 4. Actor updates the capacity of the vehicle in weight. 5. Actor updates the registration number. 6. Actor clicks on the update button.
Flow	Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked

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	1. The presented screen will be closed 3a. If the actor doesn't enter the capacity in capacity in volume 1. Error Signal will be present. 3b. If the actor enters an invalid capacity in volume 1. Error Signal will be present. 4a. If the actor doesn't enter the capacity in capacity in weight 1. Error Signal will be present. 4b. If the actor enters an invalid capacity in wight 1. Error Signal will be present. 5a. If the actor doesn't enter the capacity in registration number 1. Error Signal will be present. 5b. If the actor enters an invalid capacity in registration number 1. Error Signal will be present. 6a.If the entered data is not stored in the database 1. Error Signal will be present.
Post-Condition	Data is updated in the database, and the screen is closed.

Use Case 23:Add Shop and Shopkeeper

Use Case ID	U23
Name	Add Shop and Shopkeeper
Actor	Rider,Employee,CEO
Description	. The actor enters the shop name, phone number, and shop number, select the area from the given list, selects the city from the given list, selects the state from the given list, and the country is only Pakistan.

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Pre-Condition	Shopkeeper screen is presented.
Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to enter the identifiers. 2. Actor enters shopkeeper name. 3. Actor enters shop name. 4. Actor enters landline number. 5. Actor enters an email address. 6. Actor selects the area from the given list. 7. Actor selects the city from the given list. 8. Actor select state from the given list. 9. Actor click on the next button Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 2a. If the actor doesn't enter the shopkeeper name 1. Error Signal will be present. 2b. If the actor enters an invalid shopkeeper name 1. Error Signal will be present. 3a. If the actor doesn't enter the shop name 1. Error Signal will be present. 3b. If the actor enters an invalid shop name 1. Error Signal will be present. 4a. If the actor doesn't enter the landline number

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	1. Error Signal will be present. 4b. If the actor enters an invalid landline number 1. Error Signal will be present. 5a. If the actor doesn't enter the email address 1. Error Signal will be present. 5b. If the actor enters an invalid email address 1. Error Signal will be present.
Post-Condition	Actor click on the next button to add warehouse manager.

Use Case 24:Update Shop and Shopkeeper

Use Case ID	U23
Name	Add Shop and Shopkeeper
Actor	Rider,Employee,CEO
Description	. The actor updates the shop name, phone number, and shop number, email address, selects the area from the given list, selects the city from the given list, selects the state from the given list, and the country is only Pakistan.
The pre-Condition	Shopkeeper Update screen is presented, and the registered information of the shopkeeper in the system will be presented in the identifiers.

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Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to enter the identifiers. 2. Actor update shopkeeper name. 3. Actor update shop name. 4. Actor update landline number. 5. Actor updates an email address. 6. Actor selects the area from the given list. 7. Actor selects the city from the given list. 8. Actor select state from the given list. 9. Actor click on the next button Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 2a. If the actor doesn't enter the shopkeeper name 1. Error Signal will be present. 2b. If the actor enters an invalid shopkeeper name 1. Error Signal will be present. 3a. If the actor doesn't enter the shop name 1. Error Signal will be present. 3b. If the actor enters an invalid shop name 1. Error Signal will be present. 4a. If the actor doesn't enter the landline number

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	1. Error Signal will be present. 4b. If the actor enters an invalid landline number 1. Error Signal will be present. 5a. If the actor doesn't enter the email address 1. Error Signal will be present. 5b. If the actor enters an invalid email address 1. Error Signal will be present.
Post-Condition	The warehouse information is updated in the system, and the screen is closed.

Use Case 25:Add Payment

Use Case ID	U25
Name	Add Payment
Actor	CEO, Employee, Warehouse Manager, Rider
Description	Actor select the payment type from the list, select the payment mode from the options, enter the descriptions, select the date, update the amount, and select the sender designation, name and reiver designation name, and receiver.
The pre-Condition	Add payment screen is presented.

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Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to enter the identifiers. 2. Actor selects the payment type from the given list. 3. Actor selects the payment mode from the given options. 4. Actor enters the description. 5. Actor selects the date. 6. Actor enters the amount. 7. Actor confirms the amount. 8. Actor selects their role from the given list. 9. Actor selects their name from the given list. 10. Actor selects the sender role from the given list. 11. Actor selects the sender name from the given list. 12. Actor clicks on the add button. Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 4a. If the actor doesn't enter description 1. Error Signal will be present. 6a. If the actor doesn't enter the amount 1. Error Signal will be present. 7b. If the actor enters an invalid amount 1. Error Signal will be present.
Post-Condition	Data are stored in the database, and the screen is closed.

Use Case 26:Edit Payment

Use Case ID	U26
Name	Edit Payment
Actor	CEO, Employee, Warehouse Manager, Rider
Description	Actor select the payment type from the list, select the payment mode from the options, update the descriptions, select the date, update the amount, and select the sender designation, name and reiver designation name, and receiver.
The pre-Condition	Add payment screen is presented, and stored information is displayed in the attributes.
Flow	Main Success Scenario (or Basic Flow): 1. Actor is ready to enter the identifiers. 2. Actor selects the payment type from the given list. 3. Actor selects the payment mode from the given options. 4. Actor updates the description. 5. Actor selects the date. 6. Actor updates the amount. 7. Actor confirms the amount. 8. Actor clicks on the update button. 9. Actor selects their role from the given list. 10. Actor selects their name from the given list. 11. Actor selects the sender role from the given list. 12. Actor selects the sender name from the given list. Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 4a. If the actor doesn't enter description

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	1. Error Signal will be present. 6a. If the actor doesn't enter the amount 1. Error Signal will be present. 7b. If the actor enters an invalid amount 1. Error Signal will be present.
Post-Condition	Data are updated in the database, and the screen is closed.

Use Case 27:Ready the Incoming Order

Use Case ID	U27
Name	Ready the Incoming Order
Actor	Warehouse Manager
Description	Order after confirmation from the employee, now move toward the warehouse manager for the ordered items to be ready for delivery. After confirmation by the warehouse manager that order is ready, the rider will be notified. Now the rider can pick it up.
Pre-Condition	Order has been confirmed by the employee. And the warehouse manager gets notified.
Flow	Main Scenario: 1. View Orders Details screen will be presented with the order status of products confirmed. 2. Actor clicks on the Ready Button. 3. Actor confirms the order status has been set ready. 4. Email now will send email to the assigned rider and employee. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented.
Post-Condition	Order is ready now, and the rider can pick it up.

Use Case 28:Accomplish the Order

Use Case ID	U28
Name	Accomplish the Order
Actor	Rider
Description	Rider has reached the respective shop and delivered the order. Now he will set the order status completed. Click on the View Orders button, and a View Order Details screen will be presented. Click on the complete order button. The corresponding order will be set as completed.
Pre-Condition Flow	Rider has delivered the order successfully. The rider clicks on the view order option. Main Scenario: 1. View Order Details screen will be presented. 2. Actor will set the order status as "Completed." 3. Actor confirms the order status has been set to complete. 4. Email now will send email to the assigned employee and CEO. Extensions (or Alternative Flows): *a. If the Close button is clicked 1. Actor's respective dashboard will be presented.
Post-Condition	Order is deleivered sucessfully.

Use Case 29: Plot the Minimum Spanning Tree for Multiple Shops

Use Case ID	U29
Name	Plot the Minimum Spanning Tree for Multiple Shops
Actor	Rider
Description	Whenever rider status changes(to "On the way"), a spanning tree will be generated between warehouse and shopkeeper's Locations. Rider can veiw the route between two locations by clicking on the new route button. Data structures used in it are: 1. Graph 2. BST Algorithems used for making Minimum spanning tree is:

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Description	1. Greedy Algorithems Rider can view the shortest route of his destination one by one. As one order is accomplished the rider's location will be updated. Now he can view the shortest path towards his second destination.
Pre-Condition	Rider is ready to deliver the order.
Flow	Main Scenario: 1. View Route Screen is presented. 2. Now he can view the shortest path towards his destination.
Post-Condition	Rider reached his destination.

Use Case 30:Update Stock

Use Case ID	U15
Name	Update Stock
Actor	CEO, Employee
Description	Stock of added products will now add. Initiate update Stock screen and update identifiers. Select product, update quantity retail price and cost price, and select expiry manufacturing and date of stock add. then click on Add button. Stock will be added.
Pre-Condition	Add Stock screen will be presented to the respective actor.
Flow	Main Scenario: 1. Actor is ready to update the stock. 2. Actor selects the product from the given list. 3. Actor update the product quantity. 4. Actor update the Retail Price. 5. Actor update the Cost Price. 6. Actor selects the date of the stock added. 7. Actor selects the manufacturing date of the stock. 8. Actor selects the expiry date of the stock. 9. Actor clicks on Add button. Extensions (or Alternative Flows): *a. If the Close button is clicked

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	1. Actor's respective dashboard will be presented. *b. If the reset button is clicked 1. All identifiers will get cleared. 2a. actor doesn't update the vendor's name. 1. Error Signal will be presented. 3a. if the actor update string instead of integers. 1. Error Signal will be presented. 3b. if the actor enters a negative quantity. 1. Error Signal will be presented. 4a. if the actor update a string instead of a number. 1. Error Signal will be presented. 4b. if the actor update a negative number. 1. Error Signal will be presented. 5a. if the actor enters a string instead of a number. 1. Error Signal will be presented. 5b. if the actor enters a negative number. 1. Error Signal will be presented. 9a. If the manufacturing date is greater than the expiry date 1. Error Signal will be presented. 9b. If the manufacturing date is greater than the current date 1. Error Signal will be presented. 9c. If the expiry date is less than the current date 1. Error Signal will be presented.
Post-Condition	Stock of the product will be added.

Use Case 31: Add Company

Use Case ID	U31
Name	Update Vehicle Information
Actor	CEO
Description	CEO enter the name, contact number, and address of the company .
Pre-Condition	Add company screen is presented.
Flow	Main Success Scenario (or Basic Flow): 1. CEO is ready to enter the identifiers. 2. CEO enter the company name. 3. CEO enters the company phone number. 4. CEO enters the company address. 5. Actor clicks on the click button. Extensions (or Alternative Flows): *a. If the clear button is clicked 1. All the identifiers data remove from the screen. *b. If the close button is clicked 1. The presented screen will be closed 2a. If the CEO doesn't enter the name 1. Error Signal will be present. 2b. If the CEO enters an invalid name 1. Error Signal will be present. 3a. If the CEO doesn't enter the contact number 1. Error Signal will be present. 3b. If the CEO enters an invalid contact number 1. Error Signal will be present. 4a. If the CEO doesn't enter the address 1. Error Signal will be present.

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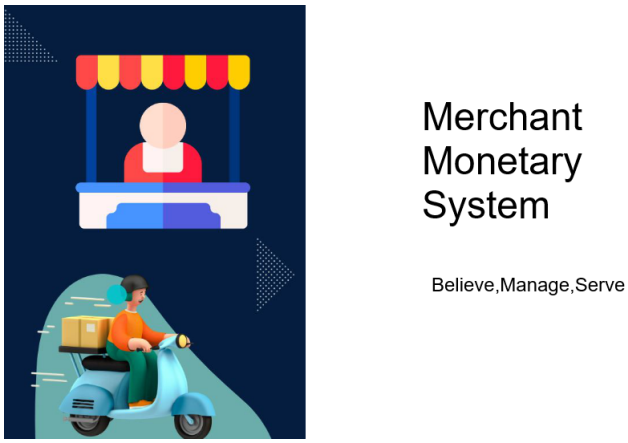
Post-Condition	Data is stored in the database.

6 User Interfaces

Introduction

Interface ID	I01
Name	Introduction
Linked Use Case	NULL
UI Interface in JUSTINMIND	

Login

Interface ID	I02
Name	Login
Linked Use Case	U01

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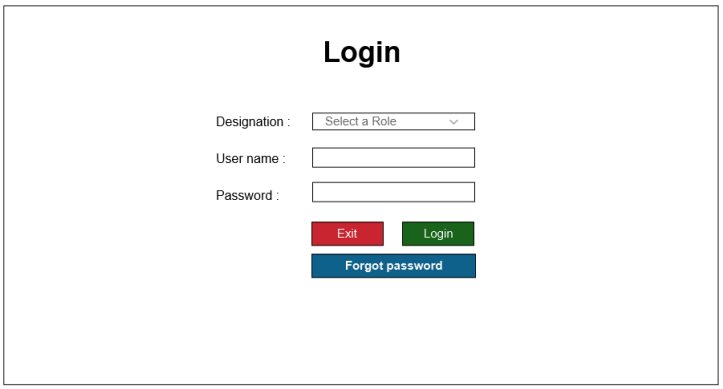
UI Interface in JUSTINMIND	
Validators	• Password Validations (Must be of 8 characters) • User Validation(Check if user exist or not)

Forgot Password

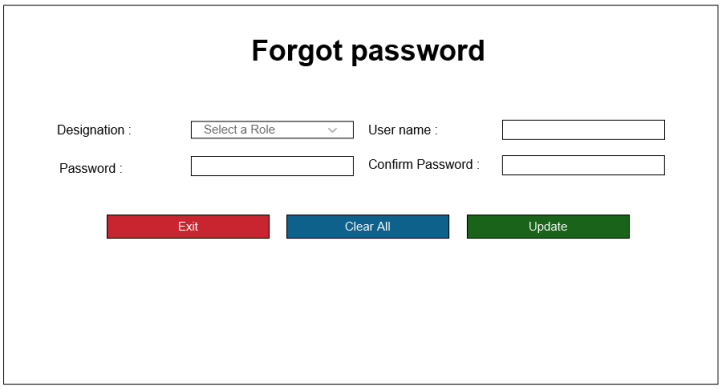
Interface ID	103
Name	Forgot Password
Linked Use Case	U02
UI Interface in JUSTINMIND	

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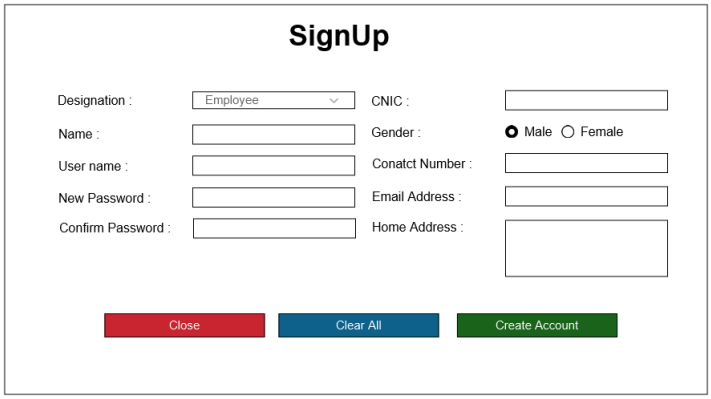
Table 36 – *Continued from previous page*

Validators	• New Password must be different from previous password • Username Validation • Password and Confirm Password Textbox are Same or not

SignUp

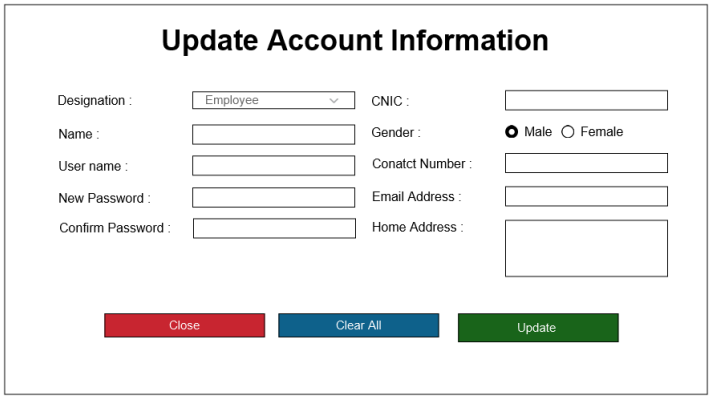
Interface ID	104
Name	SignUp
Linked Use Case	U05
UI Interface in JUSTINMIND	
Validators	• New Password and Confirmation password must be the same • CNIC must be of 13 digits • Contact Number must be of 11 digits • All Information must be provided before account creation • Email Validations

Update Account Information (CEO)

Interface ID	I05

Table 38 – *Continued on next page*

Table 38 – *Continued from previous page*

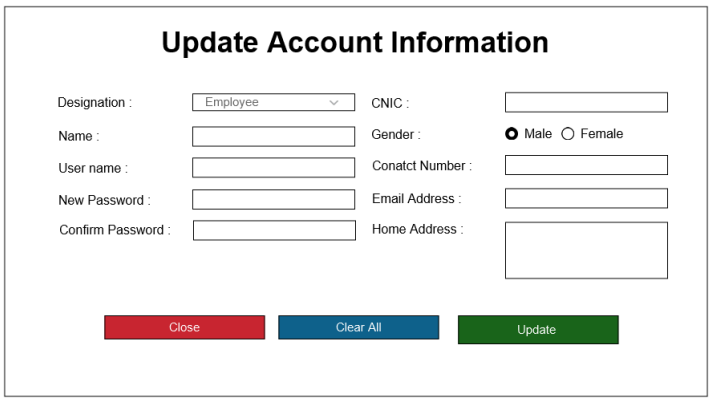
Name	Update Account Information (CEO)
Linked Use Case	U03
UI Interface in JUSTINMIND	
Validators	• New Password and Confirmation password must be the same • CNIC must be of 13 digits • Contact Number must be of 11 digits • All Information must be provided before account creation • Email Validations

Update Account Information (Employee)

Interface ID	I06
Name	Update Account Information (Employee)
Linked Use Case	U06

Table 39 – *Continued on next page*

Table 39 – *Continued from previous page*

UI Interface in JUSTINMIND	
Validators	• New Password and Confirmation password must be the same • CNIC must be of 13 digits • Contact Number must be of 11 digits • All Information must be provided before account creation • Email Validations

Account Detail (CEO)

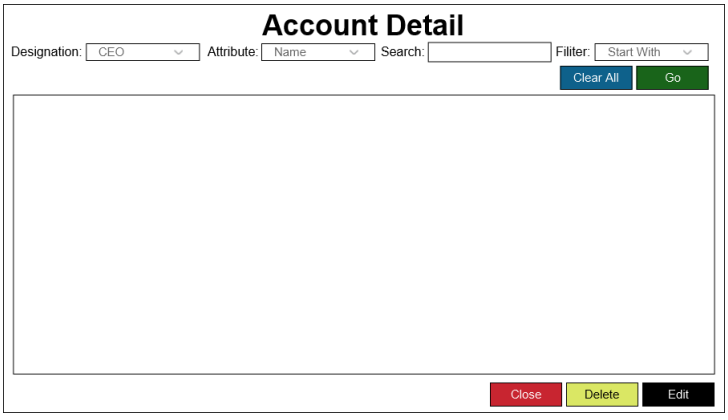
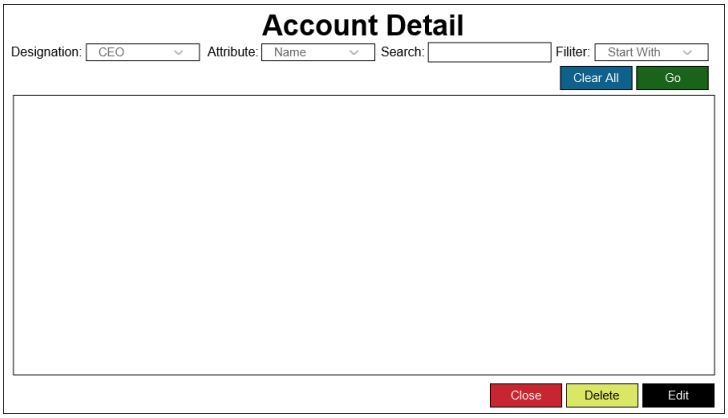
Interface ID	I07
Name	Account Detail (CEO)
Linked Use Case	U06
UI Interface in JUSTINMIND	

Table 40 – *Continued on next page*

Table 40 – *Continued from previous page*

Validators	• On clicked delete and edit button there is must to select any column first from grid list. • Filters must be applied before clicking Go

Account Detail (Employee)

Interface ID	I08
Name	Account Detail (Employee)
Linked Use Case	U07
UI Interface in JUSTINMIND	
Validators	• On clicked delete and edit button there is must to select any column first from grid list. • Filters must be applied before clicking Go

CEO Dashboard

Interface ID	I09
Name	CEO Dashboard

Table 42 – *Continued on next page*

Table 42 – *Continued from previous page*

UI Interface in JUSTINMIND	

Add Product

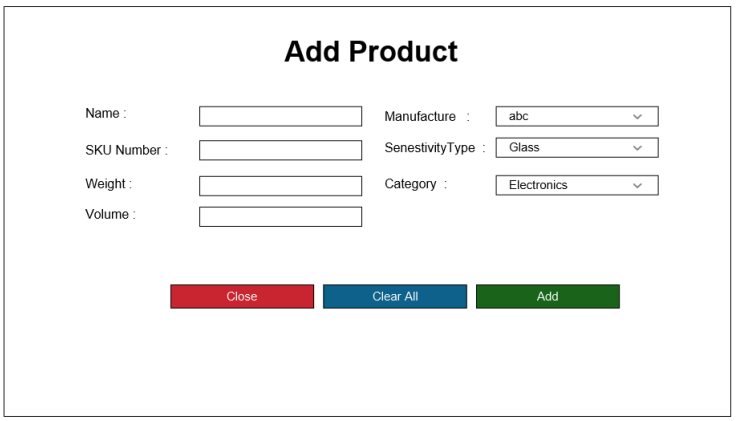
Interface ID	I10
Name	Add Product
Linked Use Case	U08
UI Interface in JUSTINMIND	

Table 43 – *Continued on next page*

Table 43 – *Continued from previous page*

Validators	• Product Name must contain only Digits and alphabets. • Cost Price must not be negative. • The date must be positive. And not previous than current. • Quantity must be positive. And not in decimals. • Rating must be positive and integer. • SKU-ID must be positive. • Weight and Volume must be in integers and decimals and positive. • IN Stock check box must be filled.

Update Product Record

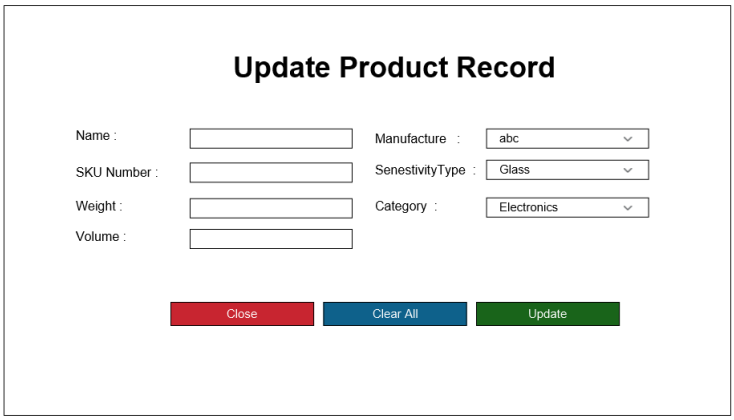
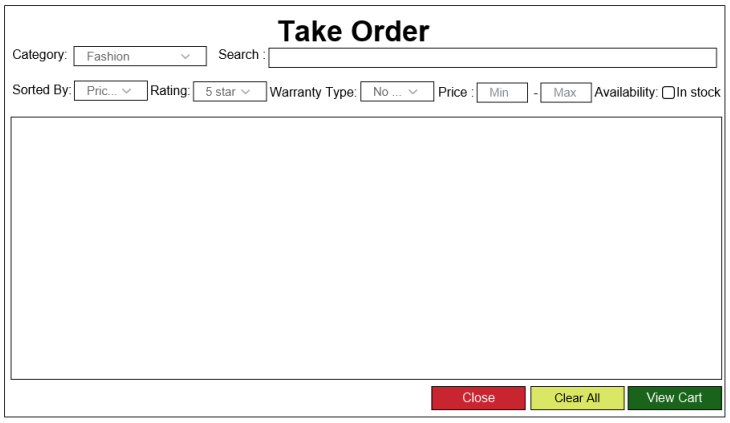
Interface ID	I11
Name	Update Product Record
Linked Use Case	U09
UI Interface in JUSTINMIND	

Table 44 – *Continued on next page*

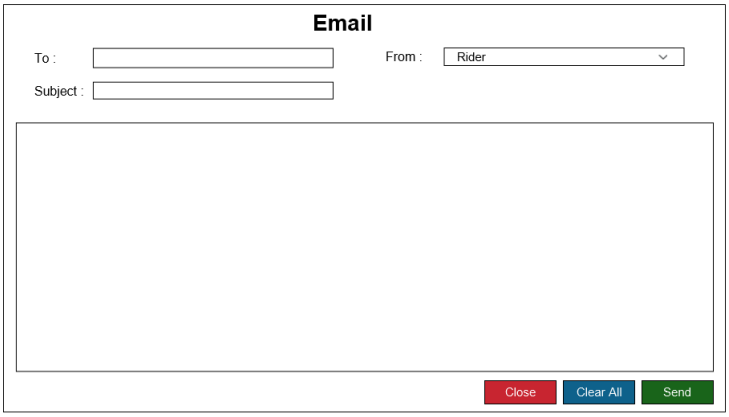
Table 44 – *Continued from previous page*

Validators	• Product Name must contain only Digits and alphabets. • Cost Price must not be negative. • The date must be positive. And not previous than current. • Quantity must be positive. And not in decimals. • Rating must be positive and integer. • SKU-ID must be positive. • Weight and Volume must be in integers and decimals and positive. • IN Stock check box must be filled.

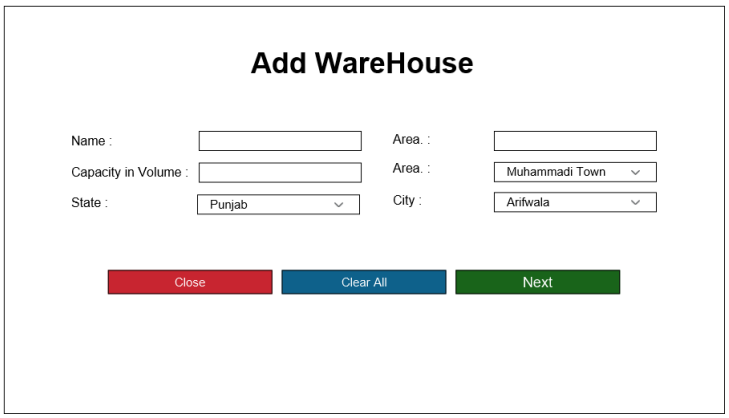
Take Order

Interface ID	I12
Name	Take Order
Linked Use Case	U19
UI Interface in JUSTINMIND	
Validators	• Price must be positive. • Search text only contains alphabets and integers only.

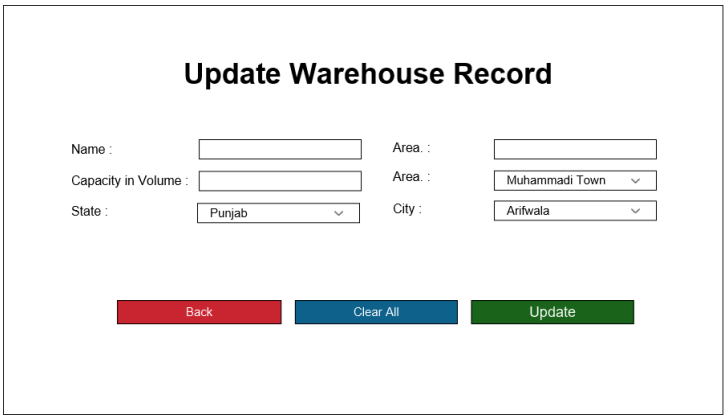
Email

Interface ID	I13
Name	Email
UI Interface in JUSTINMIND	
Validators	• To section must be filled to send the mail.

Add Warehouse

Interface ID	I14
Name	Add Warehouse
Linked Use Case	U16
UI Interface in JUSTINMIND	
Validators	• Space fields and Street No. input must be a number • Necessary fields must be filled before updating

Update Warehouse Record

Interface ID	I15
Name	Update Warehouse Record
Linked Use Case	U17
UI Interface in JUSTINMIND	
Validators	• Space fields and Street No. input must be a number • Necessary fields must be filled before updating

Warehouse Detail

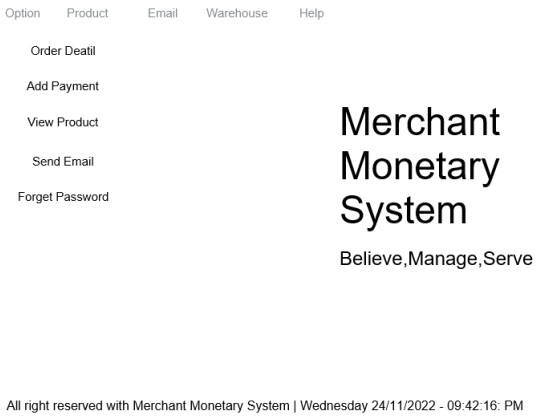
Interface ID	I16
Name	Warehouse Detail
Linked Use Case	U18

Table 49 – *Continued on next page*

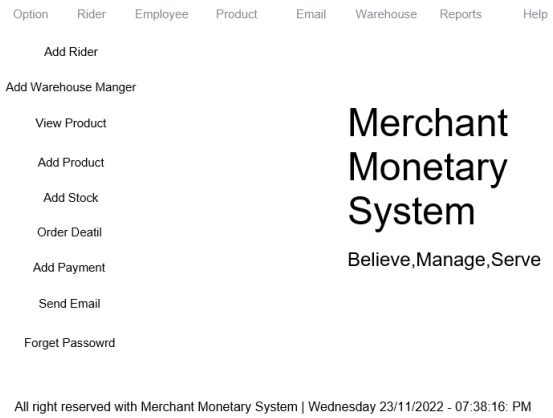
Table 49 – *Continued from previous page*

UI Interface in JUSTINMIND	
Validators	• On clicked delete and edit button there is must to select any row first from grid list. • Filters must be applied before clicking Go

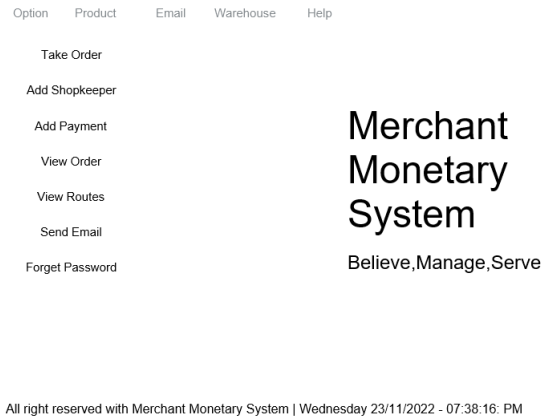
Warehouse Manager Dashboard

Interface ID	I17
Name	Warehouse Manager Dashboard
Linked Use Case	NILL
UI Interface in JUSTINMIND	

Employee Dashboard

Interface ID	I18
Name	Employee Dashboard
Linked Use Case	NILL
UI Interface in JUSTINMIND	

Rider Dashboard

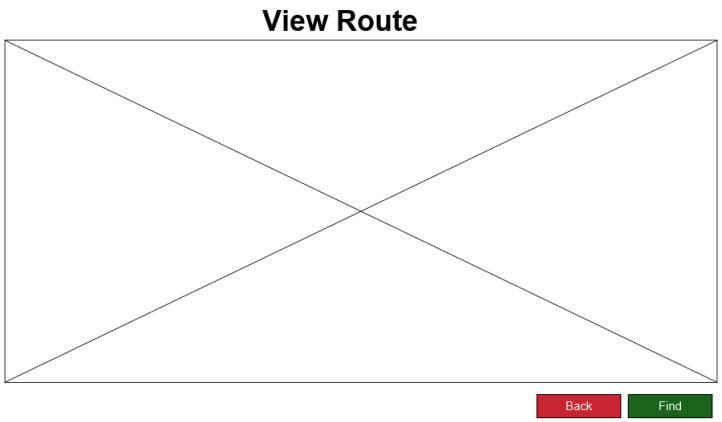
Interface ID	I19
Name	Rider Dashboard
Linked Use Case	NILL
UI Interface in JUSTINMIND	

View Route

Interface ID	I20
Name	View Route
Linked Use Case	U128 and UI29

Table 53 – *Continued on next page*

Table 53 – *Continued from previous page*

UI Interface in JUSTINMIND	
Validators	• Street No. Must not be negative • All fields must be appropriately filled to find the routes

Add Shop/Shopkeeper

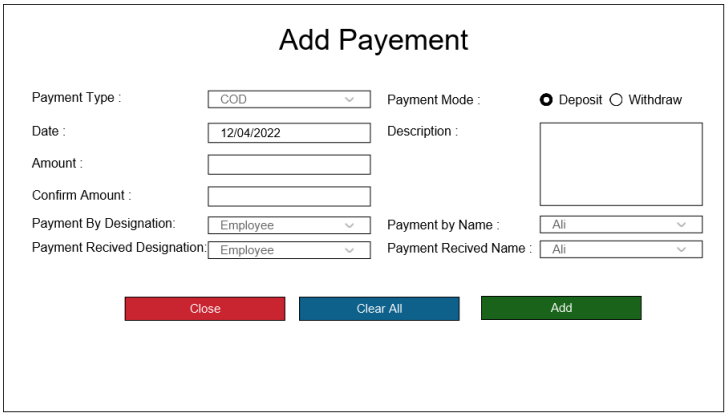
Interface ID	I21
Name	Add Shop/Shopkeeper
Linked Use Case	U23
UI Interface in JUSTINMIND	

Table 54 – *Continued on next page*

Table 54 – *Continued from previous page*

Validators	• Email Validation • Contact Number Validation • Street No. must be a non-negative number • All necessary fields must be filled before clicking Add

Add Payment

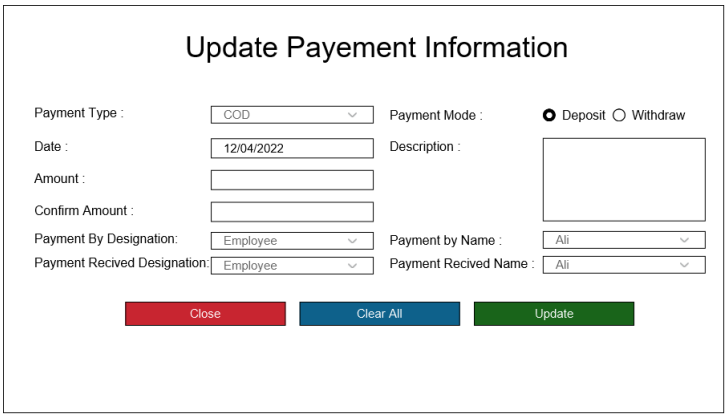
Interface ID	I22
Name	Add Payment
Linked Use Case	U26
UI Interface in JUSTINMIND	
Validators	• Deposit and Retype Deposit Amount must be a number not string • Before Clicking Add, Both fields must be filled • Both fields must be same

Update Payment Information

Interface ID	I23
Name	Update Payment Information

Table 56 – *Continued on next page*

Table 56 – *Continued from previous page*

Linked Use Case	U25
UI Interface in JUSTINMIND	
Validators	• Deposit and Retype Deposit Amount must be a number not string • Before Clicking Add, Both fields must be filled • Both fields must be same

Add Vehicle

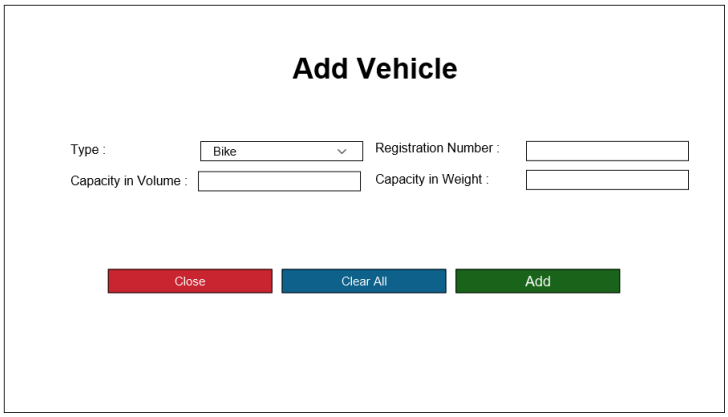
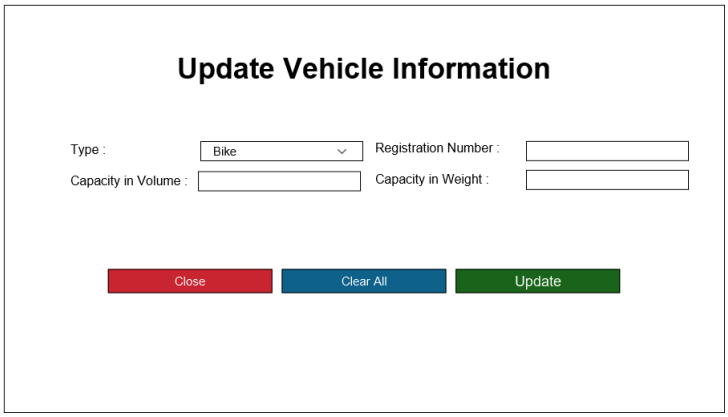
Interface ID	I24
Name	Add Vehicle
Linked Use Case	U21
UI Interface in JUSTINMIND	

Table 57 – *Continued on next page*

Table 57 – *Continued from previous page*

Validators	• • •

Update Vehicle Information

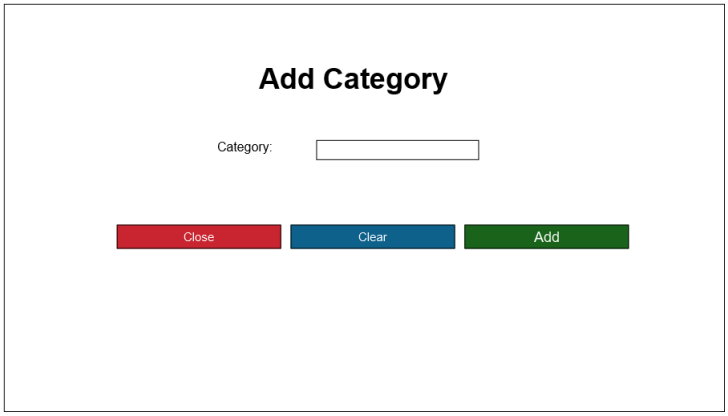
Interface ID	I25
Name	Update Vehicle Information
Linked Use Case	U22
UI Interface in JUSTINMIND	
Validators	• Registration number,Capacity in volume and weight must be number

Add Category

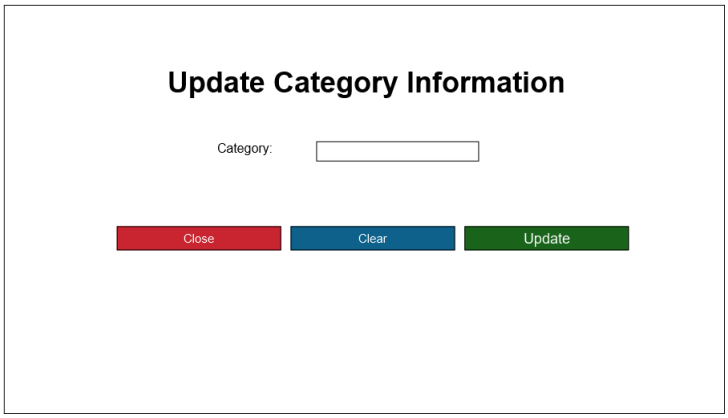
Interface ID	I26
Name	Add Category
Linked Use Case	U11

Table 59 – *Continued on next page*

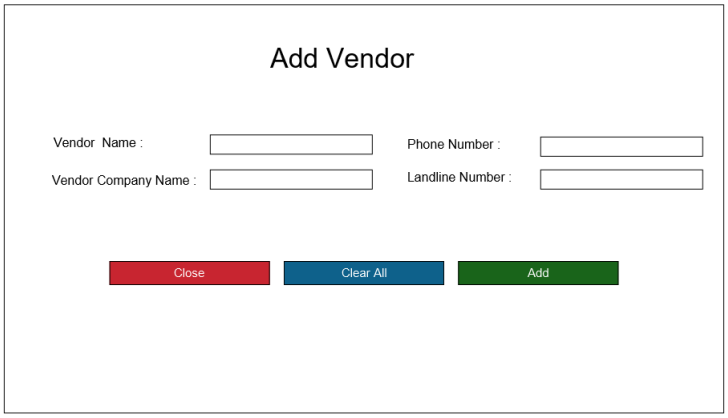
Table 59 – *Continued from previous page*

UI Interface in JUSTINMIND	
Validators	• Category must be a word.

Update Category Information

Interface ID	I27
Name	Update Category Information
Linked Use Case	U12
UI Interface in JUSTINMIND	
Validators	• Category must be a word.

Add Vendor

Interface ID	I28
Name	Add Vendor
Linked Use Case	U13
UI Interface in JUSTINMIND	
Validators	• Vendor name and company name must be a alphabetic and word. • Phone number and land line number must be number and no use of special character used.

Update Vendor Information

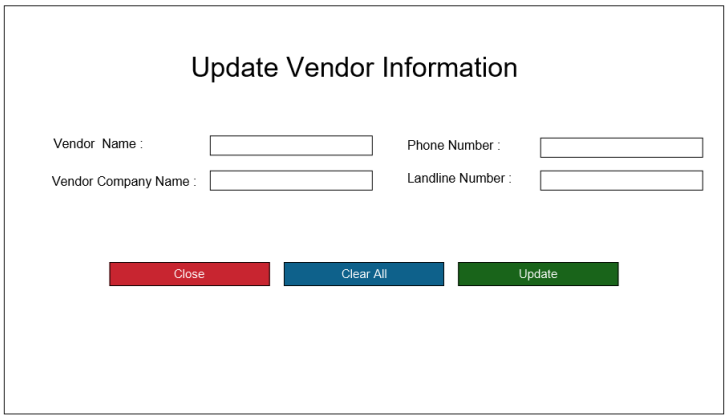
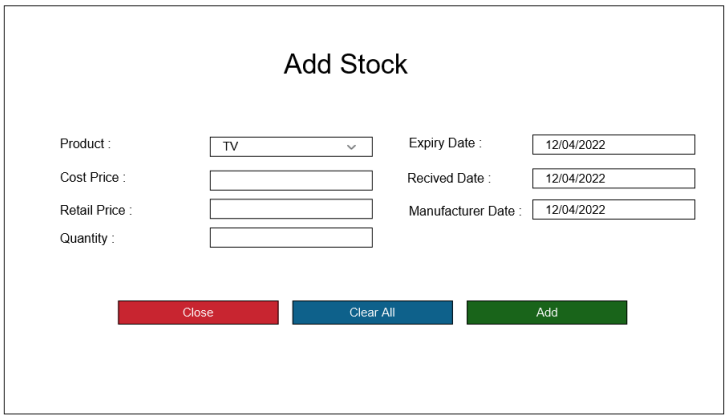
Interface ID	I29
Name	Update Vendor Information
Linked Use Case	U14
UI Interface in JUSTINMIND	

Table 62 – *Continued on next page*

Table 62 – *Continued from previous page*

Validators	• Vendor name and company name must be a alphabetic and word. • Phone number and land line number must be number and no use of special character used.

Add Stock

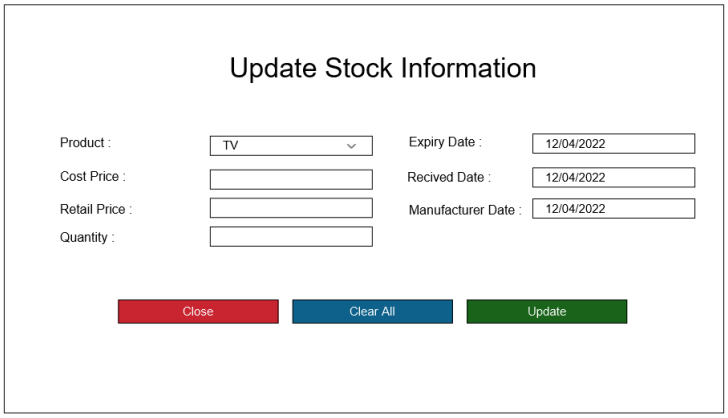
Interface ID	I30
Name	Add Stock
Linked Use Case	U15
UI Interface in JUSTINMIND	
Validators	• Quantity,retail price and cost price must be number and no use of special character used.

Update Stock Information

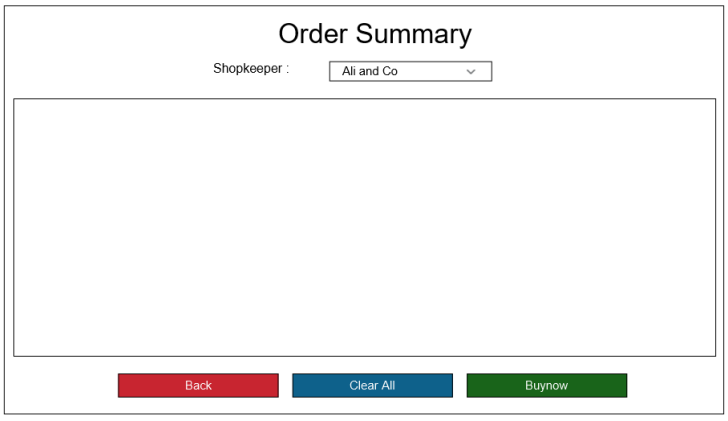
Interface ID	I31
Name	Update Stock Information
Linked Use Case	U30

Table 64 – *Continued on next page*

Table 64 – *Continued from previous page*

UI Interface in JUSTINMIND	
Validators	• Quantity,retail price and cost price must be number and no use of special character used.

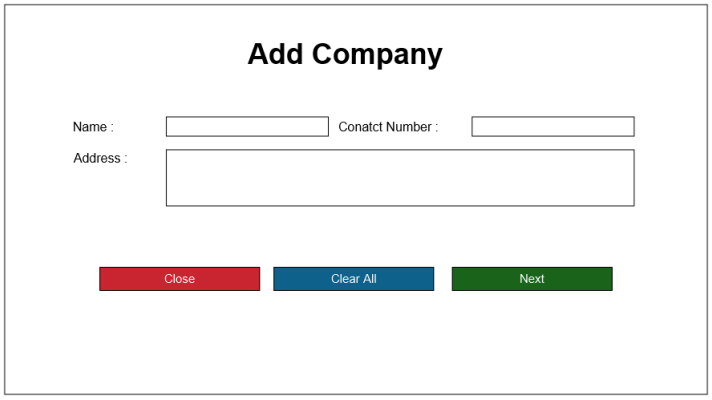
Order Summary

Interface ID	I32
Name	Order Summary
Linked Use Case	U19
UI Interface in JUSTINMIND	

Order Detail

Interface ID	I33
Name	Order Summary
Linked Use Case	U19
UI Interface in JUSTINMIND	

Add Company

Interface ID	I31
Name	Add Company
Linked Use Case	U31
UI Interface in JUSTINMIND	
Validators	• Contact number must be number and no use of special character used. • Name must be alphabetic.

7 Classes

The classes which are used in the project are as under with there specific properties.

Class Name	**Software/ Domain**	**Is Abstract (Yes/No)**	**Is Singleton (Yes/No)**	**Is the class will has parametrized constructor(Yes/No)**
CEO	Domain	No	Yes	Yes
Company	Domain	No	Yes	Yes
Office	Domain	No	Yes	Yes
WareHouse	Domain	No	Yes	Yes
User	Domain	No	No	Yes
Rider	Domain	No	No	Yes
Employee	Domain	No	No	Yes
WareHouseManager	Domain	No	Yes	Yes
ShopOwner	Domain	No	No	Yes
Shop	Domain	No	No	Yes
Ledger	Domain	No	Yes	Yes
Order	Domain	No	No	Yes
Product	Domain	No	No	Yes
Vehicle	Domain	No	No	Yes
Stack	Software	No	No	Yes
Queue	Software	No	No	Yes
Linked List	Software	No	No	Yes
Binary Search Tree	Software	No	No	Yes
Spanning Tree	Software	No	No	Yes

8 Object Oriented Features

Composition

In our Project there are 8 places where we use Composition

- Company Class has composition of Ledger Class
- Company Class has composition of Office Class
- Company Class has composition of Warehouse Class
- Company Class has composition of CEO Class
- Warehouse Class has composition of Warehouse Manager Class

- Rider Class has composition of Vehicle Class
- Office Class has composition of User Class (Employee, Rider)
- Shop Owner Class has composition of Shop Class

Inheritance

In our project inheritance is used in following places

- User inherits the class of CEO
- User inherits the class of Rider
- User inherits the class of Shopkeeper
- User inherits the class of Warehouse Manager

Multi-Level Inheritance

In our project Multilevel inheritance is used as

- User class inherits the CEO class and CEO class inherits the Employee Class

Aggregation

In our project Multilevel inheritance is used as

- Rider Aggregate the Rating Class in our project

Association

In our project Multilevel inheritance is used as

- Warehouse Manager manages the order.
- CEO manages the products
- Rider take the order
- Rider adds the order
- Employee adds the products
- Employee manages the order

9 Detailed Object Oriented Design

10 Data Strucuture

The following section shows the reason for choosing the data structure in the particular use case with a brief explanation.

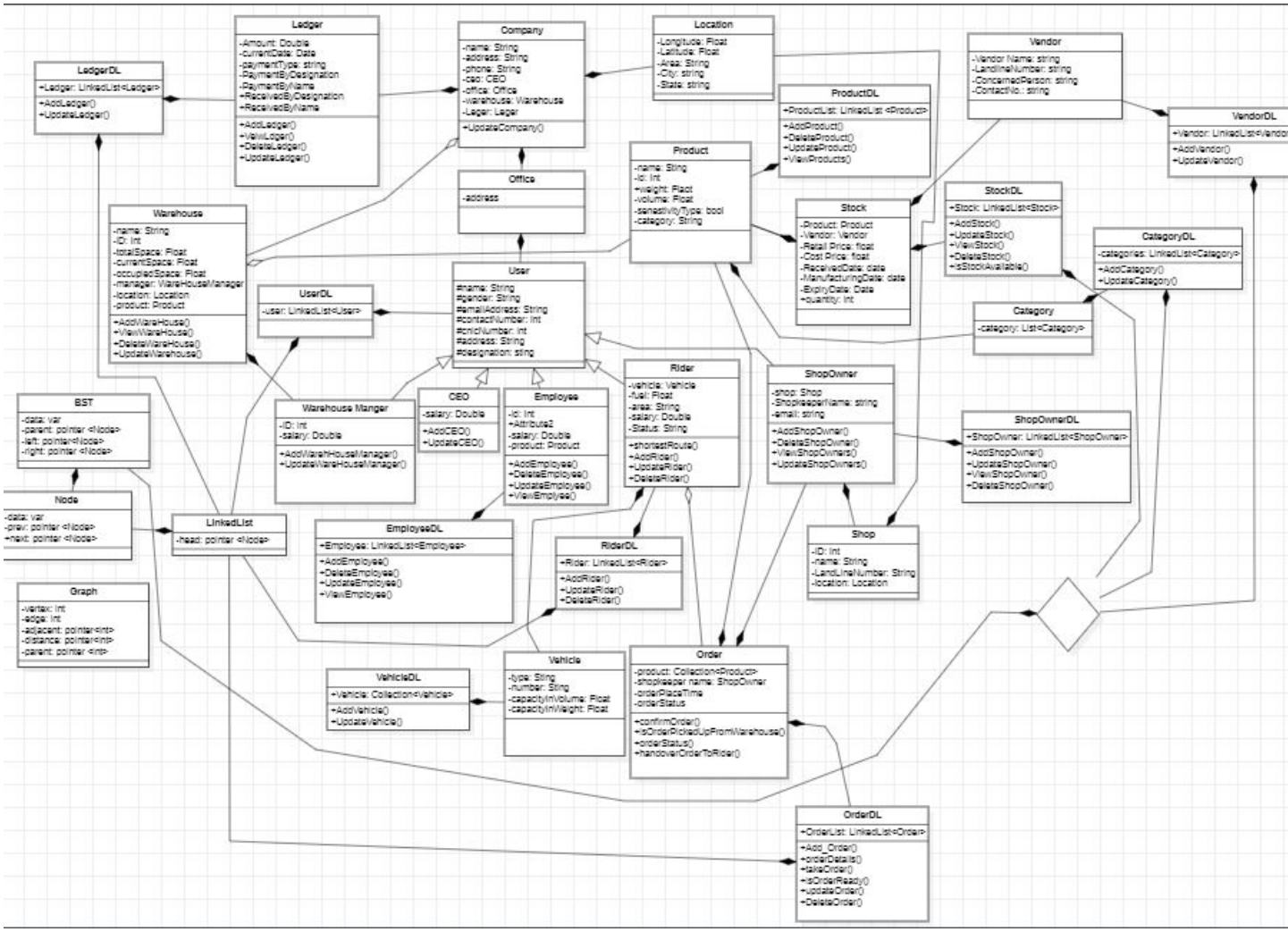


Figure 1: The detailed Object Oriented Design of the project that will be implemented according to mentioned logic

Linked List

Use Case IDs	U01,U02,U03,U04,U05,U06,U07,U08,U09,U010,U11,U12,U13,U14, U15,U16,U17,U18,U21,U22,U25,U26,U30,U31
Data Structure Used	Linked List
Time Complexity	In Worst Case: Search: O(n), Insertion: O(1), Deletion: O(n)
Space Complexity	O(n)
Justification for the use of data structure	In mentioned use case required a linear-dynamic data structure. Doubly LinkedList provides an efficient way to search the specific information from a large amount of data and then compare it with input information to produce the required result. It helps to store and delete the data fastly. It allows you to move back and forth in the list to get the required result.
Available choices	Array List,Hash Table
Comparison	The array list worst and average case time complexity is O(n). It takes contiguous memory. The hash table is best in the average case, but in the worst case time, complexity rise to O(n). It takes contiguous memory for storing the hash function value. In the average and worst case, the linked list insertion and deletion take O(1) time. In the average and worst case, it takes O(n) time for deletion. It did not require contiguous memory allocation.Array list, hash table, and linked list space complexity O(n) are the same.

Queue

Use Case IDs	U19
Data Structure Used	Queue
Time Complexity	In Worst Case: Search: O(n), Insertion: O(1), Deletion: O(n)
Space Complexity	O(n)
Justification for the use of data structure	In mentioned use case required a linear-dynamic data structure. Queue provides an efficient way to search the specific information from a large amount of data and then compare it with input information to produce the required result. It helps to store the data of orders in specific pattern . It allows to get the ordered pattern of incoming and outgoing orders data and shows the required result.

Table 70 – *Continued on next page*

Table 70 – *Continued from previous page*

Available choices	Array List,Hash Table, Linked List
Comparison	The array list worst and average case time complexity is O(n). It takes contiguous memory. The hash table is best in the average case, but in the worst case time, complexity rise to O(n). It takes contiguous memory for storing the hash function value. In the average and worst case, the linked list insertion and deletion take O(1) time. In the average and worst case, Queue takes O(n) time for deletion. It gives the specific ordered pattern to store and Dequeue reguired data.Array list, hash table, and linked list space complexity O(n) are the same.

Array List

Use Case IDs	U11,U12
Data Structure Used	Array List
Time Complexity	In Worst Case: Search: O(n), Insertion: O(1), Deletion: O(n)
Space Complexity	O(n)
Justification for the use of data structure	In mentioned use case required a linear-dynamic data structure. Queue provides an efficient way to search the specific information from a large amount of data and then compare it with input information to produce the required result.IT allows to get specific data and shows the required result.Only a specific detail of the data is required to store the specific information in this use case.
Available choices	Linked List
Comparison	The array list worst and average case time complexity is O(n). In the average and worst case, the linked list insertion and deletion take O(1) time. IN the average and worst case, List takes O(n) time for deletion. It did not require contiguous memory allocation.Array list and linked list space complexity O(n) are the same therefore for the small data Array list used.

Heap

Use Case IDs	U23,U24
Data Structure Used	Heap

Table 72 – *Continued on next page*

Table 72 – *Continued from previous page*

Time Complexity	In Worst Case: Search: O(n), Insertion: O(n), Deletion: O(n)
Space Complexity	O(n)
Justification for the use of data structure	In mentioned use case required a Heap data structure. Heap provides an efficient way to search the specific information from a moderate and huge amount of data and then compare it with input information to produce the required result. It allows to get specific data of some specific data, it allows to apply specific operation on that and shows the required result.
Available choices	Linked List
Comparison	The Heap worst and average case time complexity is O(n). In the average and worst case, the linked list insertion and deletion take O(1) time. IN the average and worst case, List takes O(n) time for deletion. It did not require contiguous memory allocation.Heap and linked list space complexity O(n) are the same therefore for the Detailed data Heap used.

Tree

Use Case IDs	U20
Data Structure Used	Tree
Time Complexity	In Worst Case: Search: O(lg n), Insertion: O(lg n), Deletion: O(lg n)
Space Complexity	O(n)
Justification for the use of data structure	In mentioned use case required a Tree data structure. Tree provides an efficient way to search the specific information from a moderate and huge amount of data and then compare it with input information to produce the required result. It allows to get specific detailed ordered data in a specfic manner and point out the points to some reference .
Available choices	Linked List
Comparison	The Tree worst and average case time complexity is O(lg n). In the average and worst case, the linked list insertion and deletion take O(1) time. IN the average and worst case, List takes O(n) time for deletion. It did not require contiguous memory allocation.Tree and linked list space complexity O(n) are not same therefore, for the Detailed data Tree is prefered to be used.

Graph

Use Case IDs	U29
Data Structure Used	Graph
Time Complexity	In Worst Case: Search: O(lg n), Insertion: O(lg n), Deletion: O(lg n)
Space Complexity	O(n)
Justification for the use of data structure	In mentioned use case required a Tree data structure. Tree provides an efficient way to search the specific information from a moderate and huge amount of data and then compare it with input information to produce the required result. It allows to plot the data and apply operation on the data to show the required result.
Available choices	Tree
Comparison	The Graph worst and average case time complexity is O(lg n). In the average and worst case, the Tree insertion and deletion take O(lg n) time. IN the average and worst case, Tree takes O(n) time for deletion. It did not require contiguous memory allocation.Tree and Graph space complexity O(n) are same therefore, for the Plotting data graph is prefered to be used.

11 Exceptions

Type of Exception	**Why this exception will occur**	**Use Case Id in which exception could be occurred**	**How you will handle the** exception
Incorrect Format	By default system, take all input in string and the deploy system need to convert into desire format. If the input data is not converted into other datatype like int and float the future task not performed e.g. string 2 and int 2 behave different in CPU.	U2 U3 U4a U4b U5a U5b U6 U7 U8 U9 U11 U13 U14 U19 U20 U21 U22 U23 U24 U25 U26 U27 U28 U29 U30 U33a	Restrict the user to enter the required data in correct format.
File not Loaded	File not found or b.	U6 U10 U11 U15 U32	Error msg will be shown and give option to user to enter correct path of the file.

Table 75 – *Continued on next page*

Table 75 – *Continued from previous page*

Stack OverFlow	When the data is more used than the assigned memory or b.	Almost All UIs except Dashboards	Error msg will be shown and give option to user to enter correct operation.
Index Out Of Range Exception	when an invalid index is used to access a member of an array or a collection	All add ,update and view UIs.	Error msg will be shown.

12 Data Storage

Mails (CSV)

Columns data names are

1. Columns data names are
2. Employee and Rider
3. Rider and Shopkeeper
4. Warehouse Manager and Employee
5. CEO and Employee

Products (CSV)

Columns data names are

1. Name
2. Cost
3. Retail price
4. Expiry Date
5. Quantity
6. In date
7. Out date
8. Manufacturer
9. ID
10. Weight
11. Volume
12. Category
13. Sensitivity

14. In stock
15. Rating
16. Warehouse Hold ID

Users (CSV)

Columns data names are

1. Name
2. Gender
3. Email address
4. Contact Number
5. CNIC number
6. Address
7. Desigination

Orders (CSV)

Columns data names are

1. Product Title
2. Quantity
3. Shopkeeper Name
4. Shopkeeper Contact
5. Rider Name
6. Location
7. Order Status
8. Order

Sale Products (CSV)

Columns data names are

1. Sale-Date
2. Name
3. Cost
4. Retail price

5. Expiry Date
6. Quantity
7. In date
8. Out date
9. Manufacturer
10. ID
11. Weight
12. Volume
13. Category
14. Sensitivity
15. In stock
16. Rating
17. Warehouse Hold ID

Category (CSV)

Columns data names are

1. Name

Vendors (CSV)

Columns data names are

1. Name
2. LandLine
3. Concered Person
4. Contact Number

Vehicles (CSV)

Columns data names are

1. Type
2. Volume Capcity
3. Weight Capcity
4. Registeration Number

Payment Records (CSV)

Columns data names are

1. Type
2. Date
3. Amount
4. Reciever
5. Payment By
6. Mode
7. Description

13 Email Sending

1. When Rider registers the Shopkeeper.
   (a) An Email is send to the Employee.
   (b) An Email is send to the Shopkeeper.
2. When Rider takes and add the order from the Shopkeeper.
   (a) An Email is send to the Employee.
   (b) An Email is send to the Shopkeeper.
3. When Employee assigns order to the Rider.
   (a) An Email is send to the Rider
   (b) An Email is send to the WareHouse Manager.
4. When Rider adds payment from the Shopkeeper.
   (a) An Email is send to the Employee.
   (b) An Email is send to the Rider.
5. When Stock from the Vendor added.
   (a) An Email is send to the Vendor
   (b) An Email is send to the Employee.
6. When WareHouseManager ready the order.
   (a) An Email is send to the Rider
   (b) An Email is send to the Employee.

14 Project Plan

15 Analytical Report