APTO Distribution

CS262- Design Document

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1 Project Description:

There is always a constant need to improve and organize the inner work process for the company in an efficient manner especially for the distribution companies because they have to deal with many clients or shopkeepers in many areas. To be more efficient, they should have records of everything. For example, they should have proper records of their clients who will buy the product, record of everything they buy and sell to shopkeepers to see how much their products are selling, how much profit they are getting, and many other things. Sometimes, the company also wants to do an analysis of the revenue or sales of its products. But these things are difficult to do manually. We aim to propose a solution to this problem by providing a desktop application that remodels and creates an easier way to assign tasks and keep track of the whole process from the order to the delivery, hence making analysis and keeping everything documented. The solution is **the Distribution System**. A distribution System is a system where all modules will be controlled within a single application. Distribution Systems are very scalable meaning more employees can be added if there is an increase in workload. There is no need to upgrade the application. Every user could have their own modules. Similarly, our project will be like this. Our project title will be **APTO Distribution**. We sell mainly **Nestle Company** products which will be beverages. In this project, there are 5 users Admin, Manager, Sales Agents, Delivery Employees, Order Dispatcher, and Shopkeepers which will have no relation to the distribution application. Every user will have its module. **Admin** is an owner of the distribution company. The admin has all the privileges and visibility over all modules. He will have the highest priority as he is the one who hires managers and can hire other employees if needed. The **Manager** has most of the responsibilities in the system. He must create clients, employees, schedules, and reports. He also must always check the performances, and check inventory. The manager will have to assign tasks to almost all the Employees, Sales Agents, and Order dispatchers. The manager will also control the salary of employees. He will create their schedule consisting of the address the sales agent must attend daily. The sales agent must attend to those schedules and write a report on the respective situation. This report is later checked by the manager. This process will include scoring and daily documentation of the performance and a special bonus will be given which will increase the competition among sales agents and overall, the performance will get better. Every **Sales Agent** will have their own account. He will be responsible for taking orders from existing clients and making new clients. He must achieve high performance and find as many clients or shopkeepers as he can. He can get bonuses depending on that performance. Every sales agent will have a specific route and their vehicle fuel will be provided by the company. Every sales agent will use **API Google-map** to find the shortest path to the shopkeepers to save fuel. The estimated time will also be calculated. After placing the order, a **mail** will be sent to the shopkeeper's registered mail that his order is placed. This system will have an **Order Dispatcher**. He will manage the whole inventory in the warehouse and will notify the manager whenever a new product should be made. The order dispatcher will be responsible for calculating holding costs (salary of employees, rent, maintenance) versus calculating ordering costs

(shipping). He can add or delete products and record expired products. His duties will be to see new orders from the clients in the system and prepare them for the Delivery Employee to pick them up. The delivery employee will be responsible for taking orders from the warehouse facility and delivering them to the corresponding addresses with the bill. When an order is dispatched from the warehouse, mail will be sent to the shopkeeper that his order is dispatched. The shopkeeper could pay the bill fully or half or could pay the bill later. There will be a limit to loaning a bill but after that, no orders will be taken from that shopkeeper until he clears his previous charges. After receiving the bill, he will update the info in the application and mail will be sent to the Manager. The shopkeepers will be the last user of the system. The shopkeeper can make an order by contacting its corresponding Sales Agent or when the sales agent comes to him for an order on the scheduled day. Admin or Manger can see daily, weekly, and monthly **analyses** of sales products and reports of sales agent's performance. The analysis could be in graph form and in tabular form and it could be downloaded in PDF form. Expenses and revenue could be downloaded in PDF form. Admin and Manger can also download CSV files of reports and other users' progress data.

2 Project Features:

- Employees Management
- Product Management
- Email Sending
- Route Management
- Order Management

3 Technology Stack:

Language	Python
IDEs	Spyder, Qt Designer

4 Project Actors:

In our project we have different type of users which have different roles.

- **Admin**
  Admin will be the owner of the distribution company. The major responsibility of the admin will be to hire management team and add them into the application. He will be shown all the modules.
- **Manager**
  The manager will manage all employees in the company. He will hire the sales man,

order dispatcher team and delivery team. He will assign routes to the sales team and to the delivery team. Also, he will analyze the performance of all employees.

- **Sales Team**
  Sales man will be assign routes form the manager. He will visit these routes and gets order from the shopkeepers. He will create profiles of the shopkeeper which are purchasing products from our company.
- **Order Dispatcher**
  He will be working in the warehouse. His main responsibility will be whenever new order comes he will prepare the order for the delivery. He will update the status of the order in the application that the order is ready to be delivered. He will also assign delivery man for order delivering.
- **Delivery Team**
  They will deliver order prepared by the order dispatcher and follow the route assigned by the manager to the shopkeeper under the given time. They will also receive payment from shopkeepers and add it into software.

5 Use Cases:

Use Cases are the functionalities which can be accessed by the Users of application depending upon their designation.

Use Case 1 (Login User):

Use Case ID	U01
Name	Login User
Actor	Admin, Manager, Order Dispatcher, Delivery Team
Description	All users will login to the system through login page by putting their required information like Username and Password.
Flow	All users will login to the system through login page by putting their required information like Username and Password. Then, clicking login button at login page will lead each User to their desired menu. If user do not enter anything and login button is clicked then, User cannot login.

Use Case 2 (Add User):

Use Case ID	U02
Name	Add User
Actor	Admin, Manager, Sale team
Description	Admin will have access to add new manager, sale team, order dispatcher and delivery team. Manager will add Sale Team, Order Dispatcher and Delivery team. Sales Team will go to their assigned routes and will add new Shopkeeper if that Shopkeeper is not already added to the system. All the actors can Add only when they are logged in to their corresponding menu.
Flow	Admin will login and add Manager. Manager, then, will hire Sales team, Order Dispatcher and Delivery Team. Sales Team will find new Shopkeepers on their route and add them into system.

Use Case 3 (Update User):

Use Case ID	U03
Name	Update User
Actor	Admin, Manager, Sale team
Description	Admin will be able to update data of manager, sale team, order dispatcher and delivery team. Manager will update data Sale Team, Order Dispatcher and Delivery team. Sales Team will update data of Shopkeeper if that Shopkeeper is already added to the system. All the actors can Update only when they are logged in to their corresponding menu.
Flow	Admin can Update Manager, Sale Team, Order Dispatcher and Delivery Team. Manager can update Sale Team, Order Dispatcher and Delivery team. Sale Team can update the shopkeepers.

Use Case 4 (Delete User):

Use Case ID	U04
Name	Delete User
Actor	Admin, Manager, Sale team
Description	Admin will be able to delete data of manager, sale team, order dispatcher and delivery team. Manager will delete data Sale Team, Order Dispatcher and Delivery team. Sales Team will delete data of Shopkeeper if that Shopkeeper is already added to the system, to remove data of that specific shopkeeper. All the actors can Delete only when they are logged in to their corresponding menu.
Flow	Admin can delete Manager, Sale Team, Order Dispatcher and Delivery Team. Manager can delete Sale Team, Order Dispatcher and Delivery team. Sale Team can delete the shopkeepers.

Use Case 5 (Retrieve User):

Use Case ID	U05
Name	Retrieve User
Actor	Admin
Description	Our program will be able to save and load data of all the Users. On start, the application loads the data of all the Users and data of all the Users will be saved to corresponding files when Use Case 2 (U02), Use Case 3 (U03), Use Case 4 (U04) are being used.
Flow	When application starts, the application loads the data of all the Users and data of all the Users will be saved to their relevant files when specific type of user is being created, updated, or deleted.

Use Case 6 (Assign Route to Delivery Team):

Use Case ID	U06
Name	Assign Route to Delivery Team
Actor	Order Dispatcher
Description	Order Dispatcher is the User who will assign the order to the delivery team and mark any order as ready to be delivered. Actor will be able to assign the routes to the Delivery Team. Actor will determine the shortest path to reduce the cost of fuel.
Flow	Actor will login to the application then click on Assign Route button in menu and assign route to the Delivery Team Officials according to their orders assigned.

Use Case 7 (View Delivery Team Position):

Use Case ID	U07
Name	View Delivery Team Position
Actor	Admin, Manager
Description	Admin will own the access to maximum feature and Manager is the one who will have responsibility to manage the users and features. Both Admin and Manager will be able to view the position of Delivery Team. Actors will have access so that they can keep a close eye on the travelling record of the Delivery Team and analyze the performance of the Order Dispatcher.
Flow	The Actors will first login to the application then they will click on the Delivery Team Position button and they will have position of the Delivery Team on their screen.

Use Case 8 (Place Order):

Use Case ID	U08
Name	Place Order
Actor	Sale Team
Description	Delivery Team will get the order details from Order Dispatcher, deliver the order to the shopkeeper under the assigned time. The Actor will also be able to get the order of required good from the shopkeeper and place it on the application for further process. Order Dispatcher will make sure to make order ready as fast as possible.
Flow	After order assigned by the Order Dispatcher to specified Delivery Team Official, Delivery Team Official after logging in, will deliver the ordered goods to shopkeeper by moving through the path assigned by the Order Dispatcher.

Use Case 9 (Cancel Order):

Use Case ID	U09
Name	Cancel Order
Actor	Admin, Manager, Sale Team
Description	Sale Team will visit the route assigned and add new shopkeepers and new orders to the system. The order added are stored in the list and can be deleted from the list in order to cancel the order. The actors can cancel any specific order just by deleting the order from the list.
Flow	After order assigned by the Order Dispatcher to specified Delivery Team Official, Delivery Team Official after logging in, will deliver the ordered goods to shopkeeper by moving through the path assigned by the Order Dispatcher.

Use Case 10 (Mark Order as Delivered):

Use Case ID	U10
Name	Mark Order as Delivered
Actor	Delivery Team
Description	Delivery Team, after being order assigned by Order Dispatcher, will go on the assigned route by the Order Dispatcher to deliver the orders to the shopkeepers. Actor will deliver the order to shopkeeper and Mark Order as Delivered in the application. This Mark as Delivered will directly go to the Order Dispatcher's Menu.
Flow	Delivery Team, after getting order to deliver, delivers the order to the shopkeepers, and then marks the order as delivered on application.

Use Case 11 (Dispatch Order):

Use Case ID	U11
Name	Dispatch Order
Actor	Order Dispatcher
Description	Order Dispatcher get the list of ordered items from the Sales Team. Order Dispatcher makes the items in the Order List ready to deliver. Order Dispatcher makes the order ready in sequence of First in First Out such as in Queue. The Actor dispatches the orders to deliver by assigning it to Delivery Team.
Flow	Order Dispatcher will login to its application, click on Dispatch Order Button and dispatches the Order.

Use Case 12 (Add Products):

Use Case ID	U12
Name	Add Products
Actor	Manager
Description	Manager will manage the data of the products. Manager will add the data of the products. The data of the product will be added to the list of products which can be used while placing order by Sales Team. Manager will be able to set all the properties of the product while adding.
Flow	First Manager will login to the application, then click on the add product to add new products, then Manager will enter the data of the product and then click Add to add product to the system.

Use Case 13 (Update Products):

Use Case ID	U13
Name	Update Products
Actor	Manager
Description	Manager will be able to update the data of the product. Data of the product will also update in the list of the products. Manager will be setting new values to the attributes of the product.
Flow	First Manager will login to the application, then click on the update product to add new products, then Manager will enter the updated data of the product and then click Update to update product to the system.

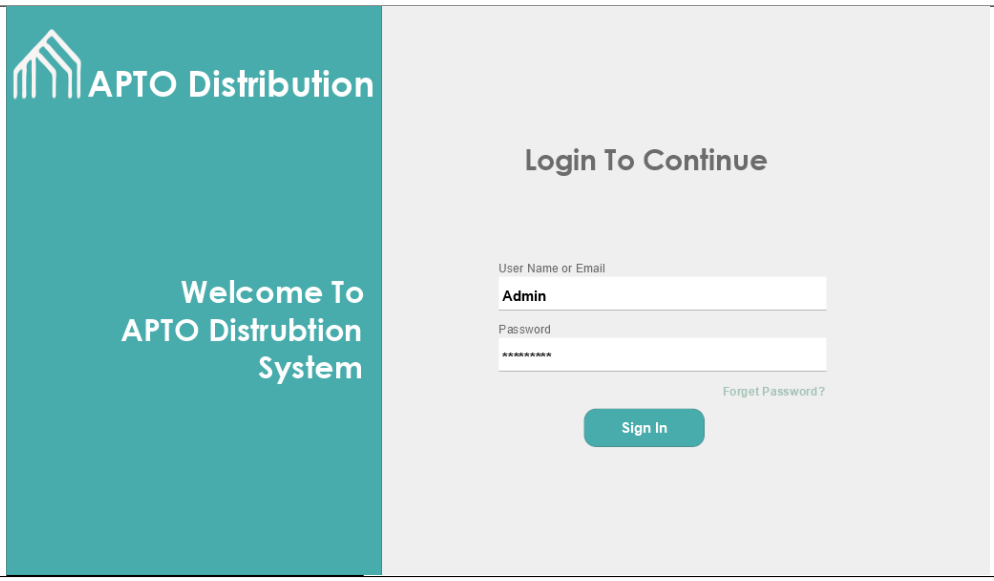
Use Case 14 (Retrieve Products):

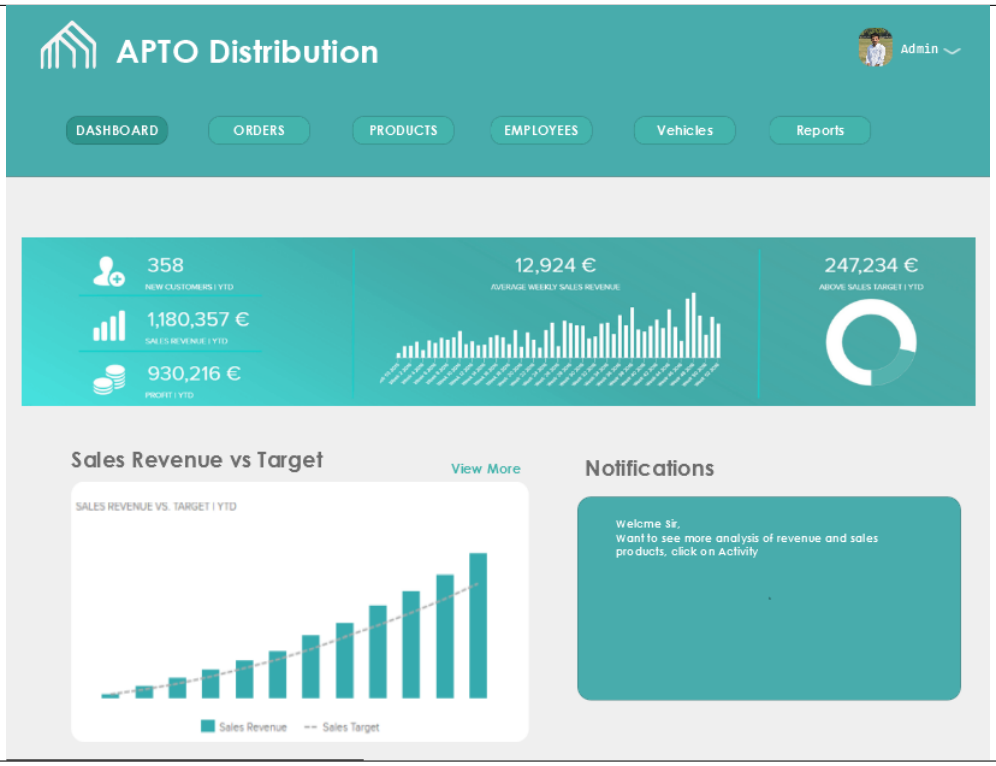
Use Case ID	U14
Name	Retrieve Products
Actor	Manager
Description	Manager, being able to manage the data of the products, will save the data of the products will store the data of the product. The application will also be read the data from the files. Manager will be storing the data of the products when User Case 11 (U11), User Case 12 (U12), or User Case 14 (U14) are used.
Flow	Manager already logged in will store the data of the products when there is any change in data of the list of the products by clicking on corresponding button of changing data value in above mentioned Use Cases.

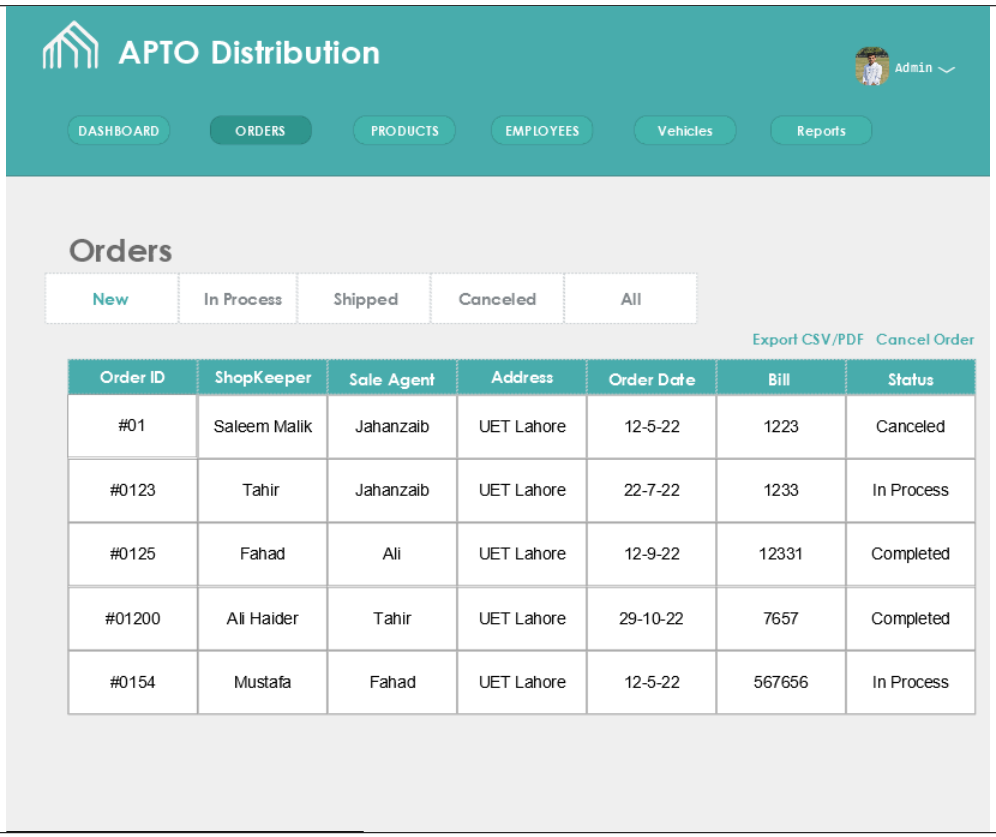
Use Case 15 (Delete Product):

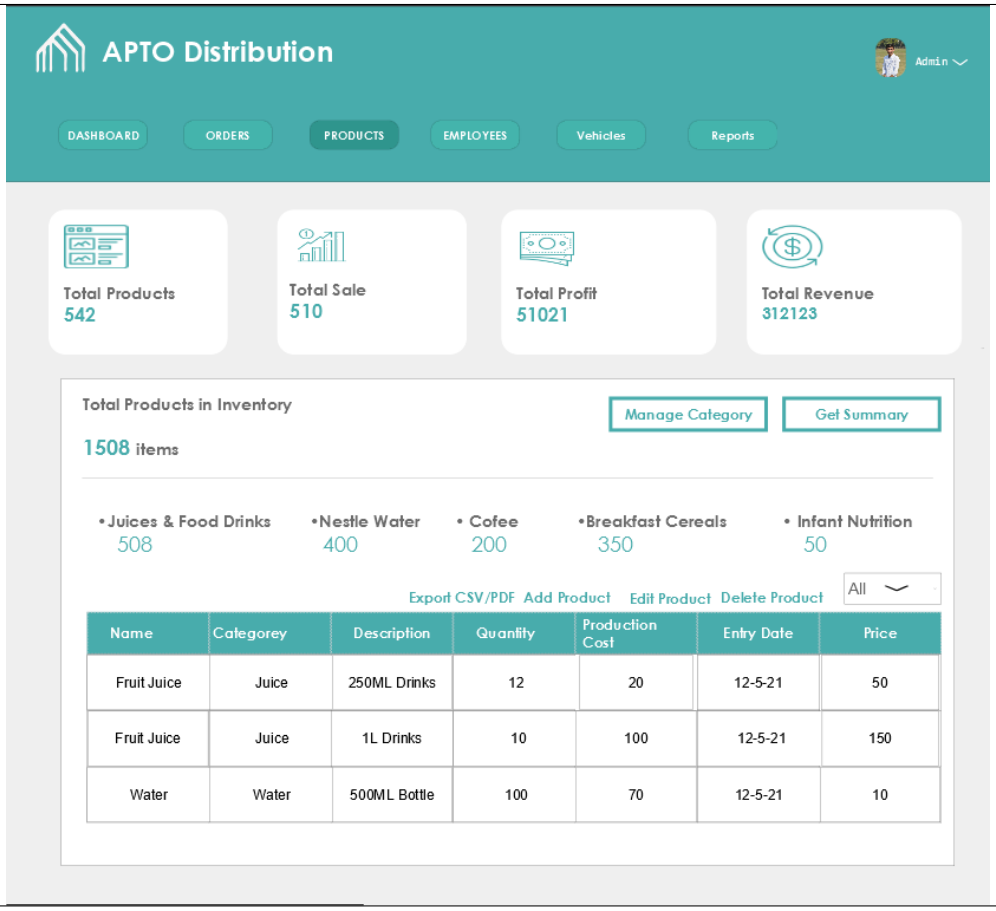
Use Case ID	U15
Name	Delete Product
Actor	Manager
Description	Since Manager will manage the data of the products, the Manager will be able to delete the data of the products. The data of the product will delete from the list of products which can be helpful while placing order by Sales Team. Manager will be able to nullify all the properties of the product while deleting.
Flow	First Manager will login to the application, then click on the Delete Product to delete existing products, and then click Delete to Delete product from the system.

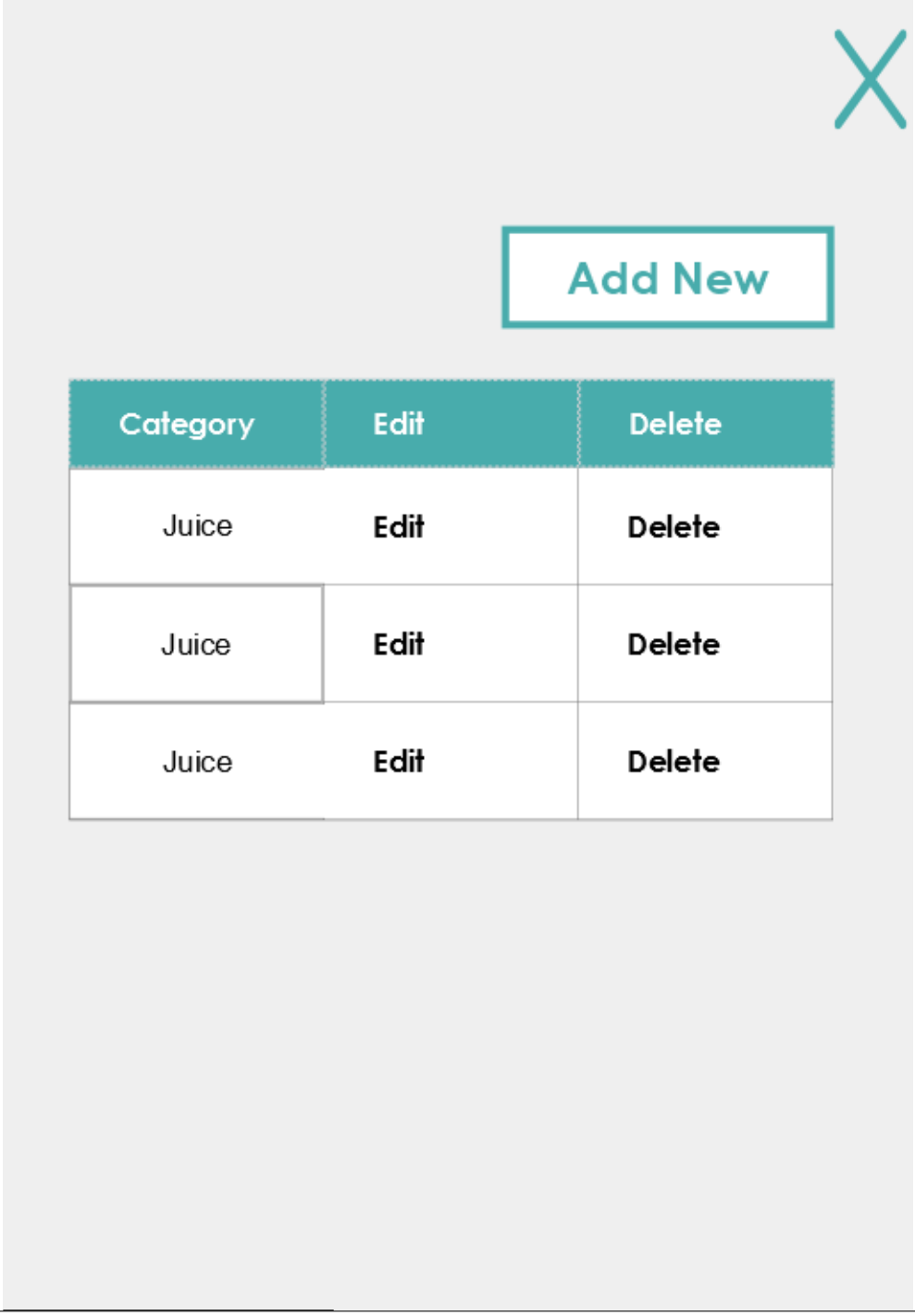
6 Use Interfaces:

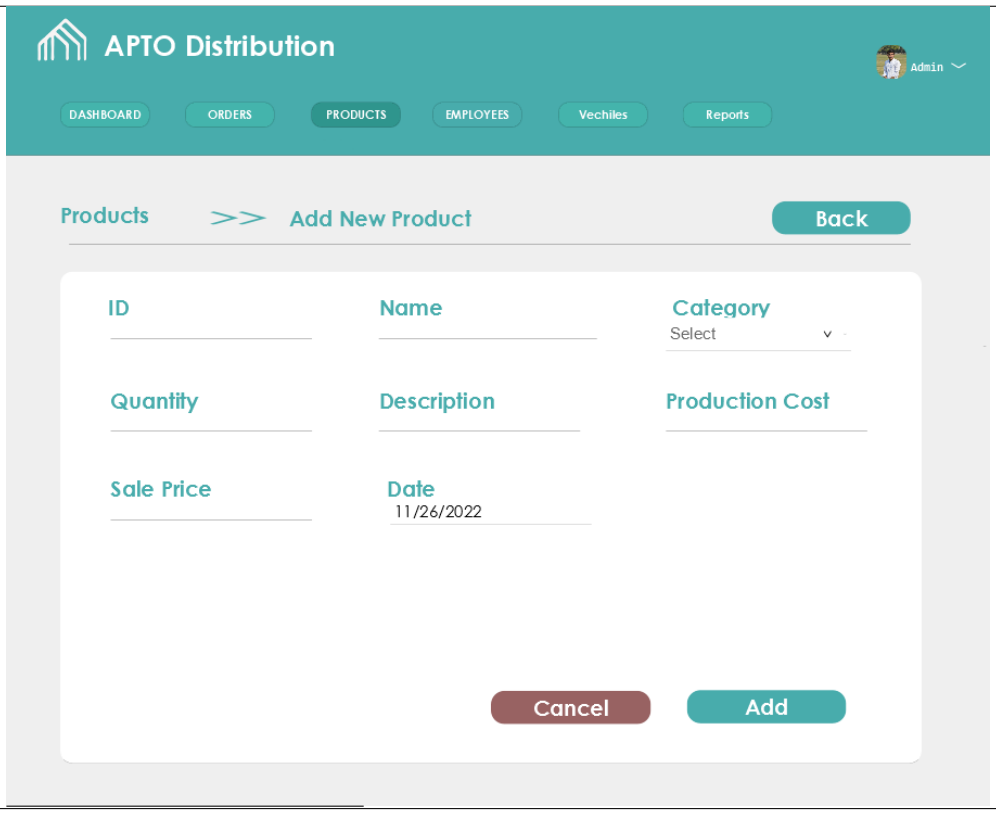
Interface ID	I01
Name	Login Page
Linked Use Case	U01
UI Screen (JustIn-Mind)	
Validators	If the user provides the correct credential then the user will login into their respective module otherwise an error will show in a label form below the text box.

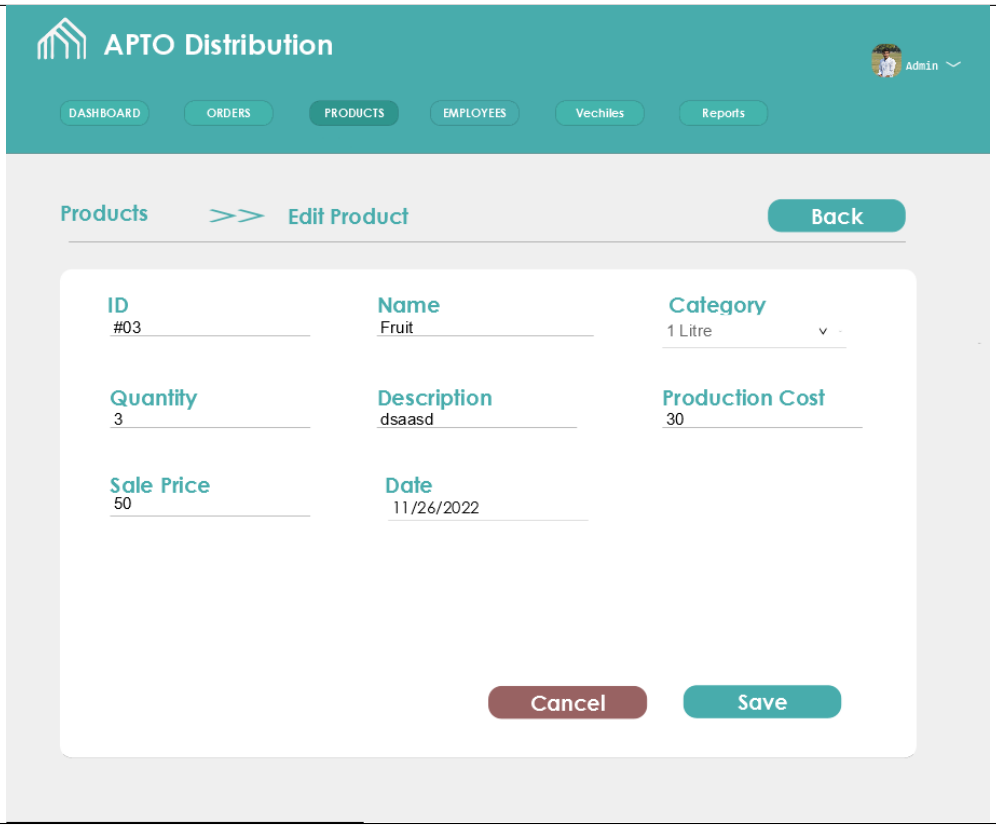
Interface ID	I02
Name	Admin Window Dashboard
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	NA

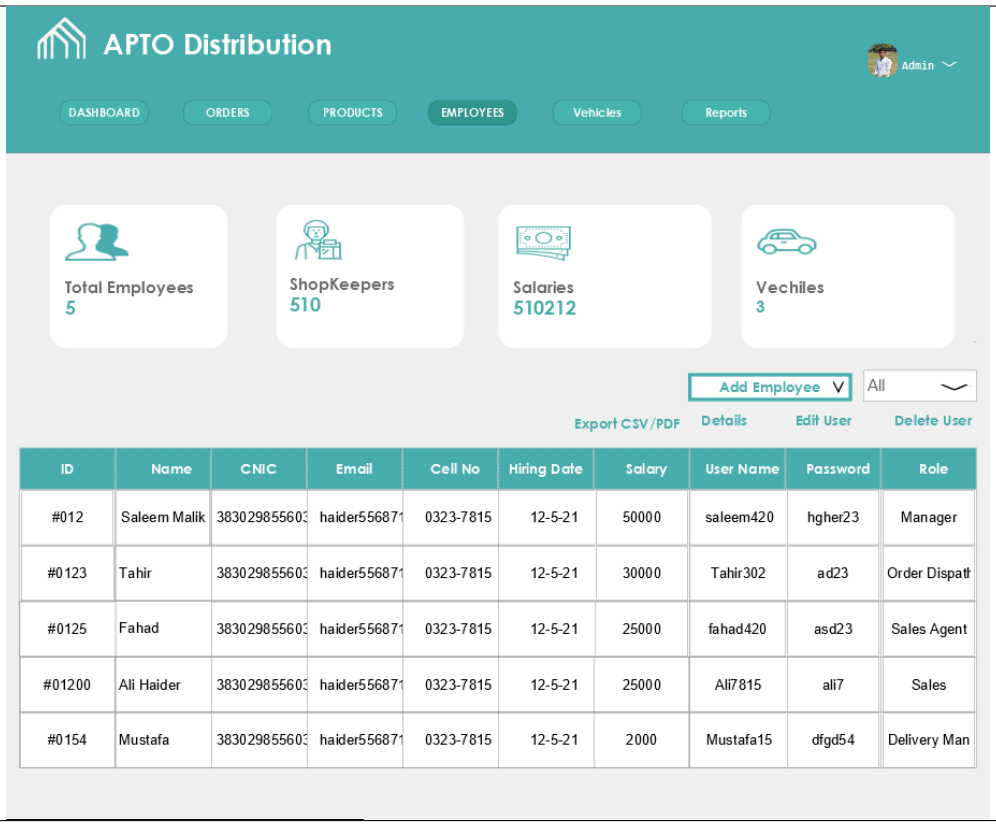
Interface ID	I03
Name	Admin Order Window
Linked Use Case	U08
UI Screen (JustIn-Mind)	
Validators	NA

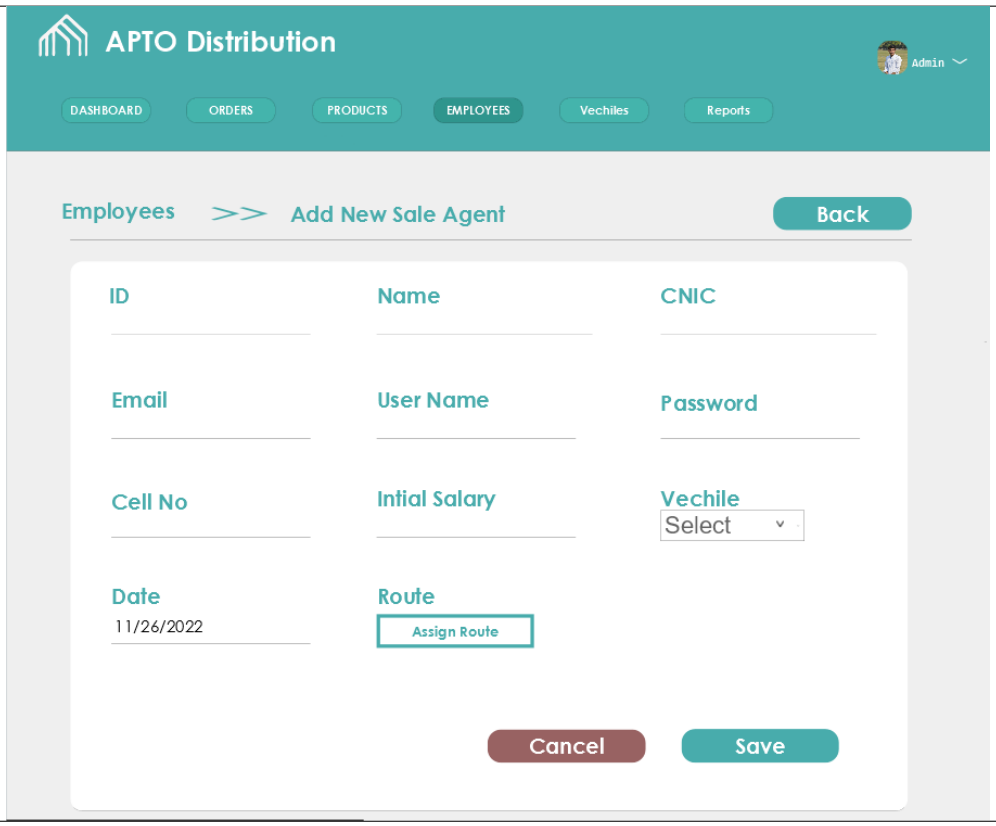
Interface ID	I04
Name	Admin Product Window
Linked Use Case	U12, U13, U14, U15
UI Screen (JustIn-Mind)	
Validators	NA

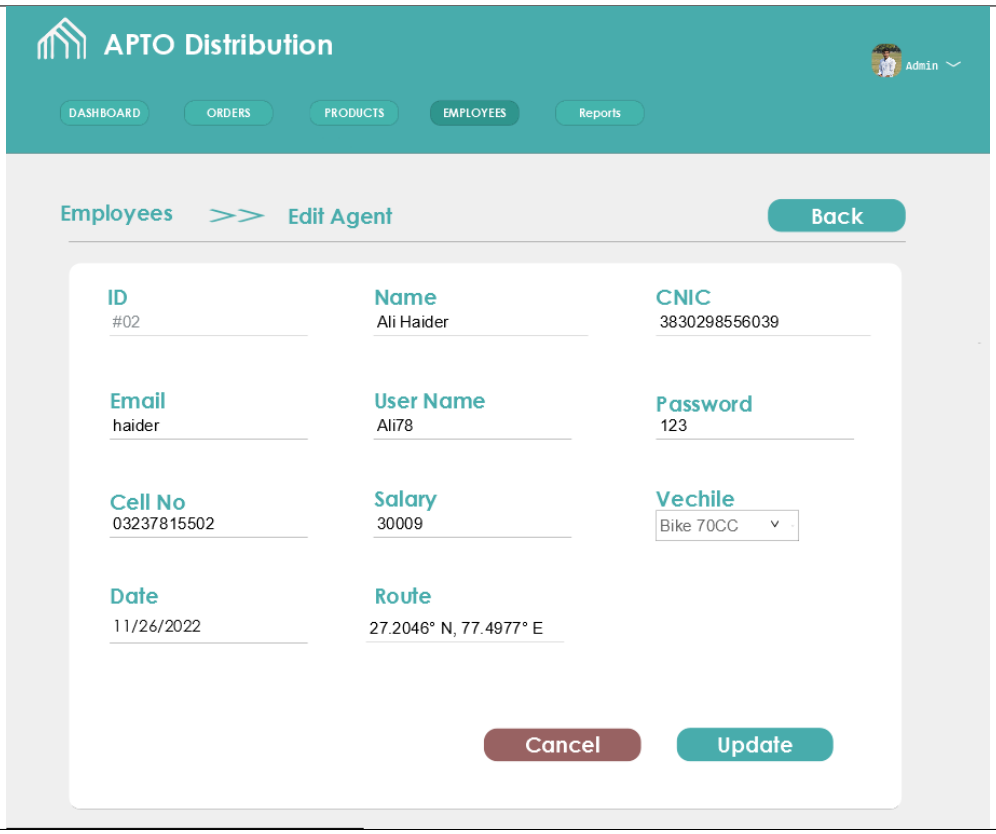
Interface ID	I05
Name	Admin Add Category Window
Linked Use Case	U02, U03, U04, U05
UI Screen (JustIn-Mind)	
Validators	NA

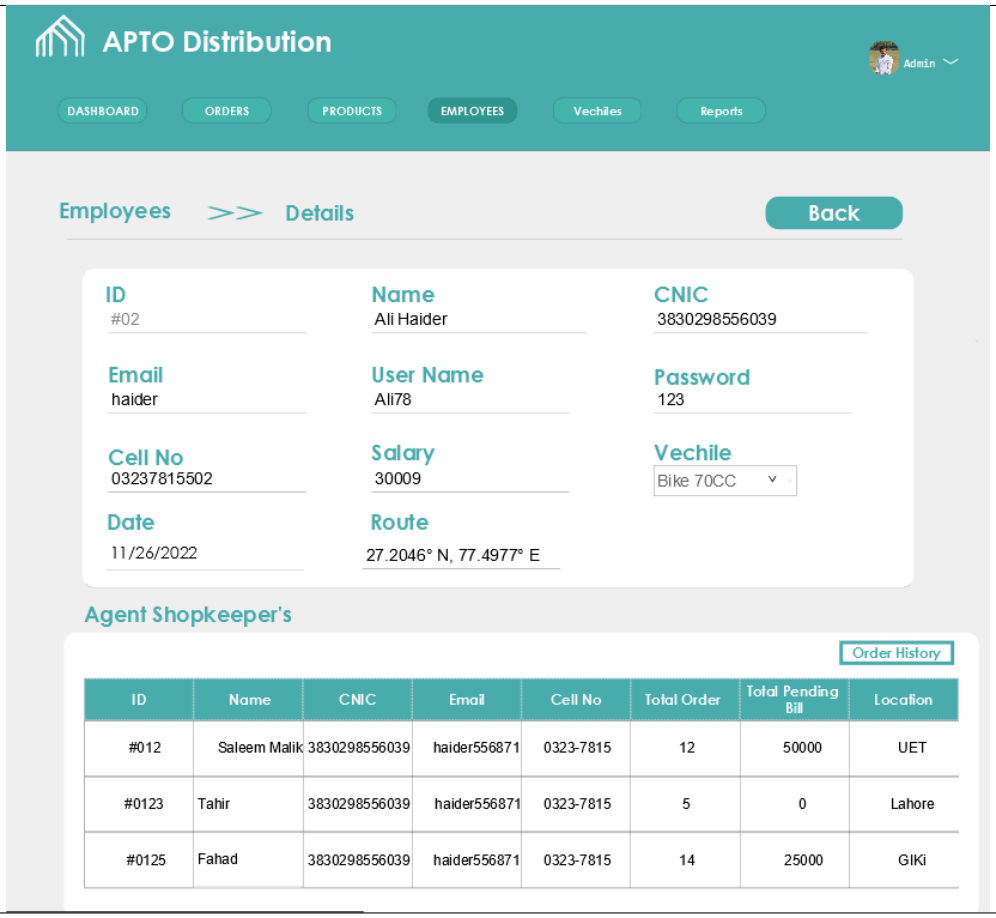
Interface ID	I06
Name	Admin Add Product Window
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	• ID of the product will be specific i.e P...(number) • Quantity, Production Cost, and Sale Price must be integers • The category can only select from the combo box only

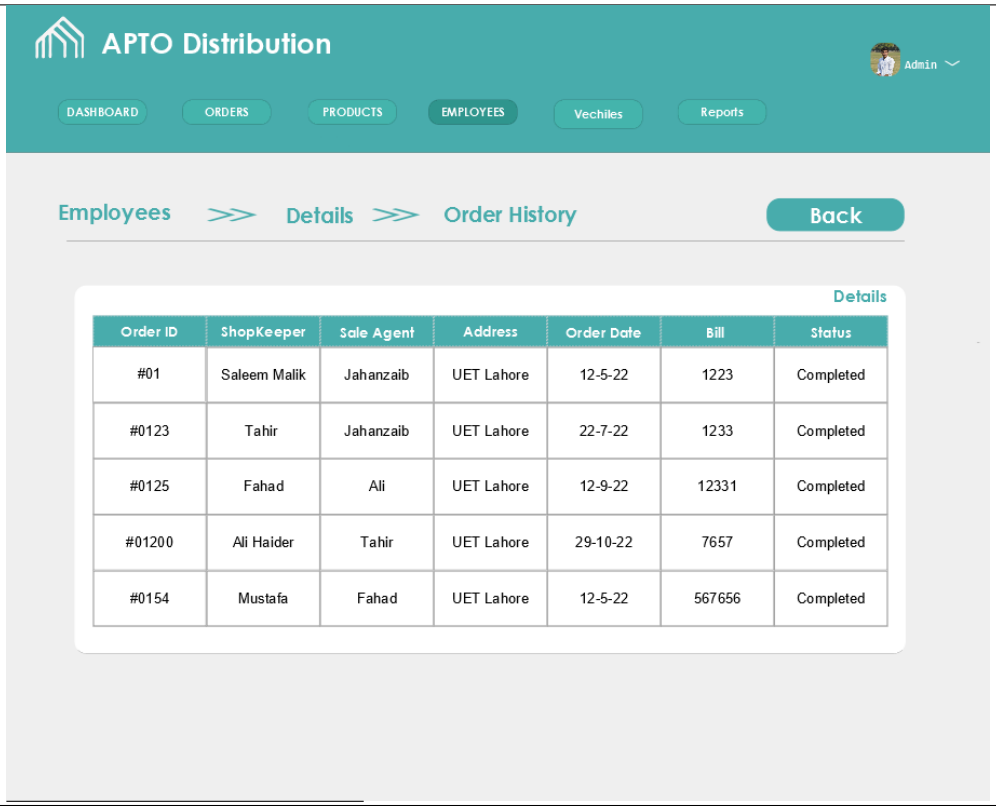
Interface ID	I07
Name	Admin Edit Product Window
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	• ID of the product will be specific i.e P...(number) • Quantity, Production Cost, and Sale Price must be integers • The category can only select from the combo box only

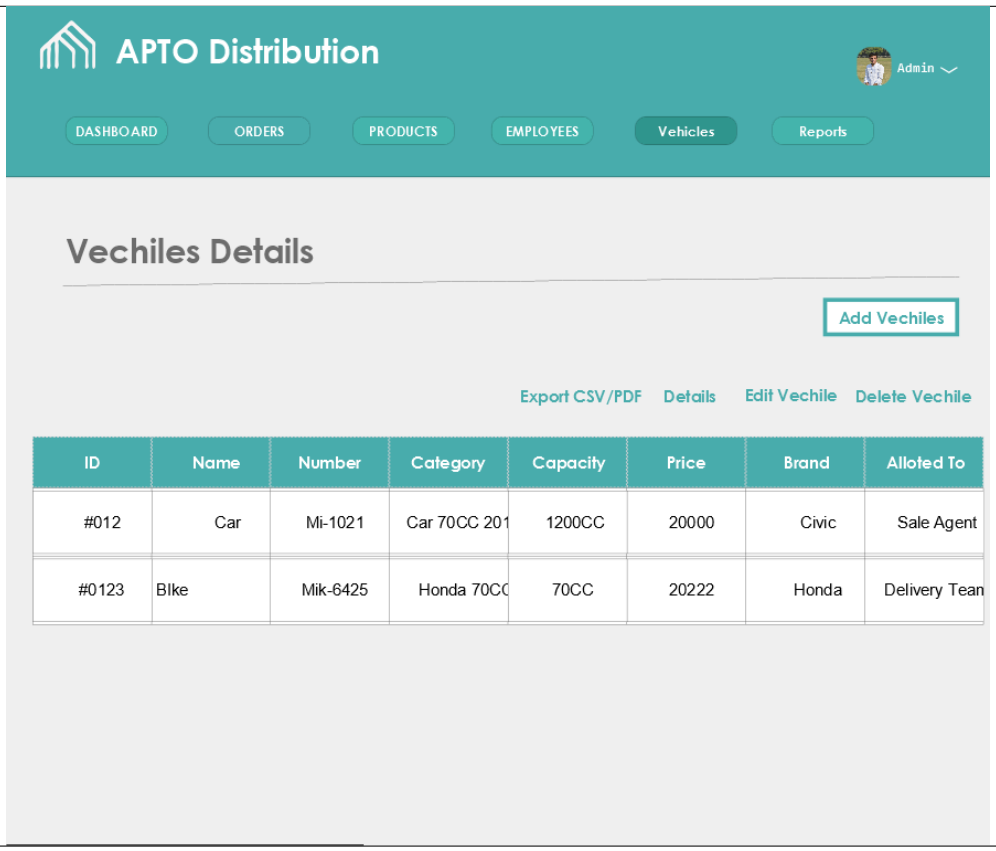
Interface ID	I08
Name	Admin Employee Window
Linked Use Case	U02, U03, U04, U05
UI Screen (JustIn-Mind)	
Validators	• Admin can add any type of new employee from Add Employee Combo box and will be directed to a specific page according to employee type

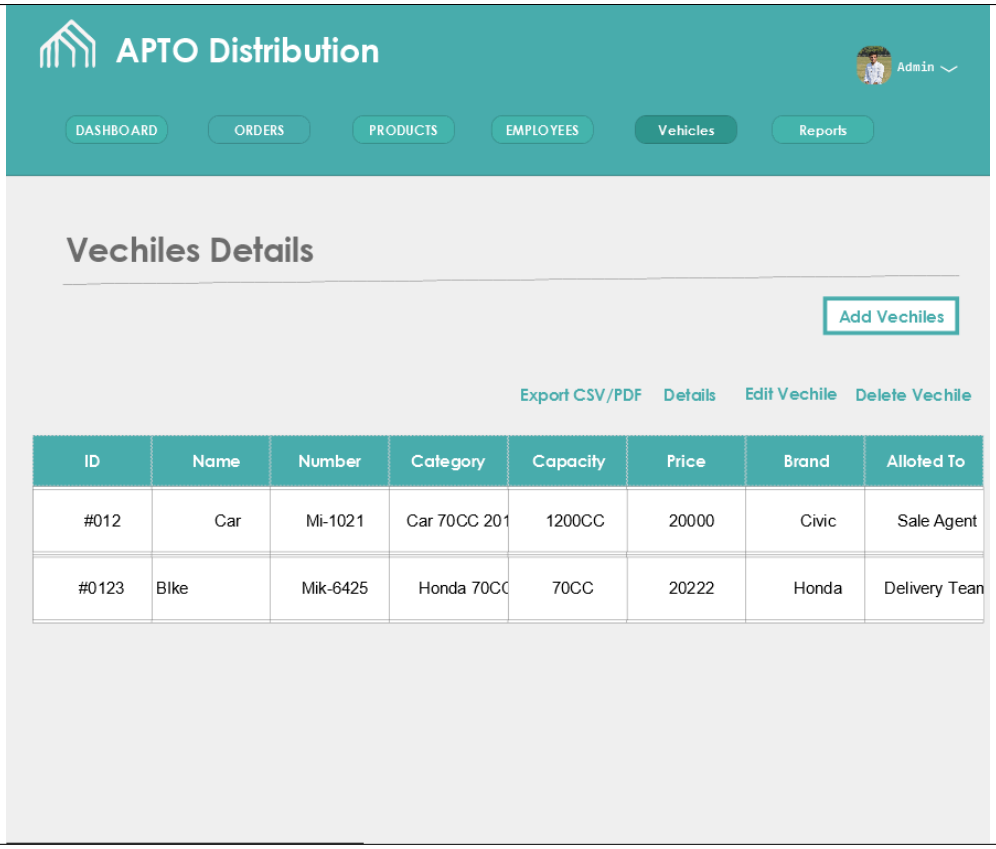
Interface ID	I09
Name	Admin Add Employee Window
Linked Use Case	U02, U03, U04, U05
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e S...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers • The vehicle can be selected from only the combo box • Email should be in correct form i.e abc@gmail.com

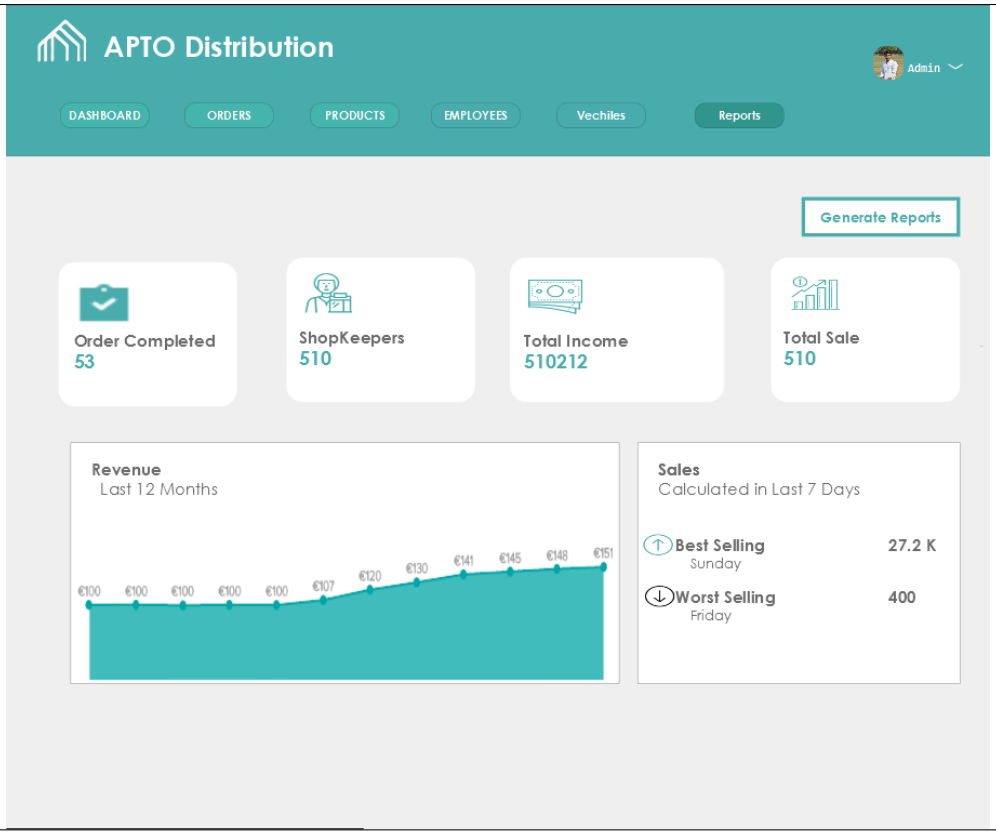
Interface ID	I10
Name	Admin Edit Employee Window
Linked Use Case	U02, U03, U04, U05
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e SA...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers • The vehicle can be selected from only the combo box • Email should be in correct form i.e abc@gmail.com

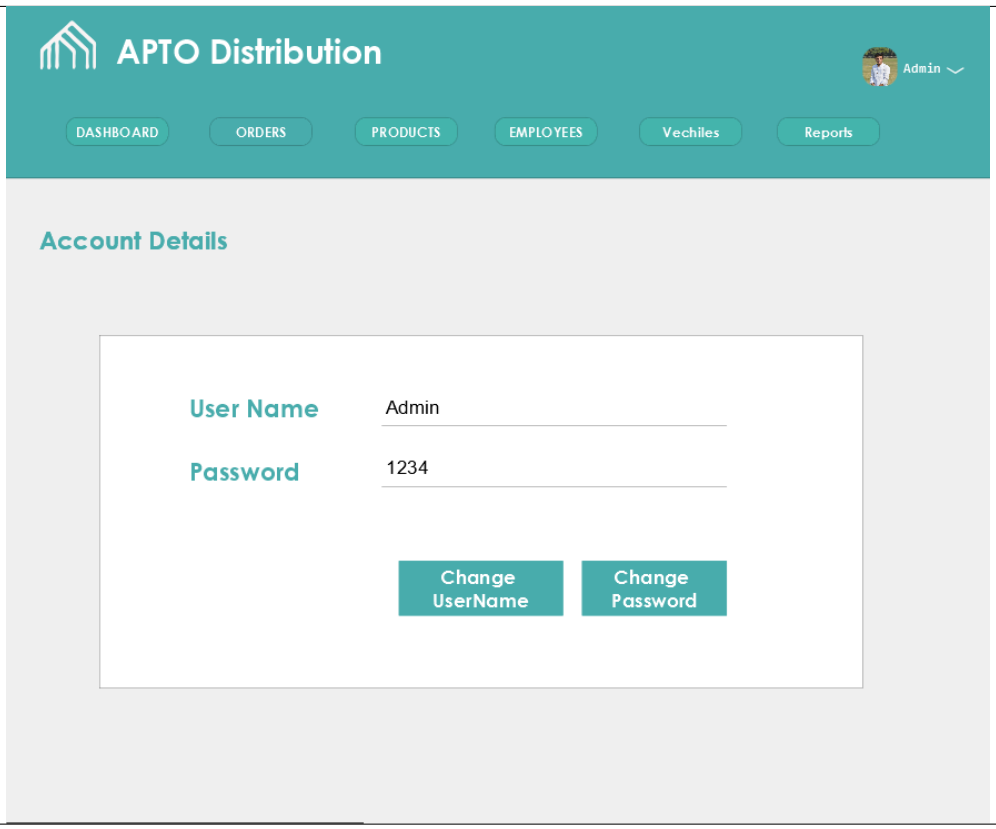
Interface ID	I11
Name	Admin Employee Details Window
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	NA

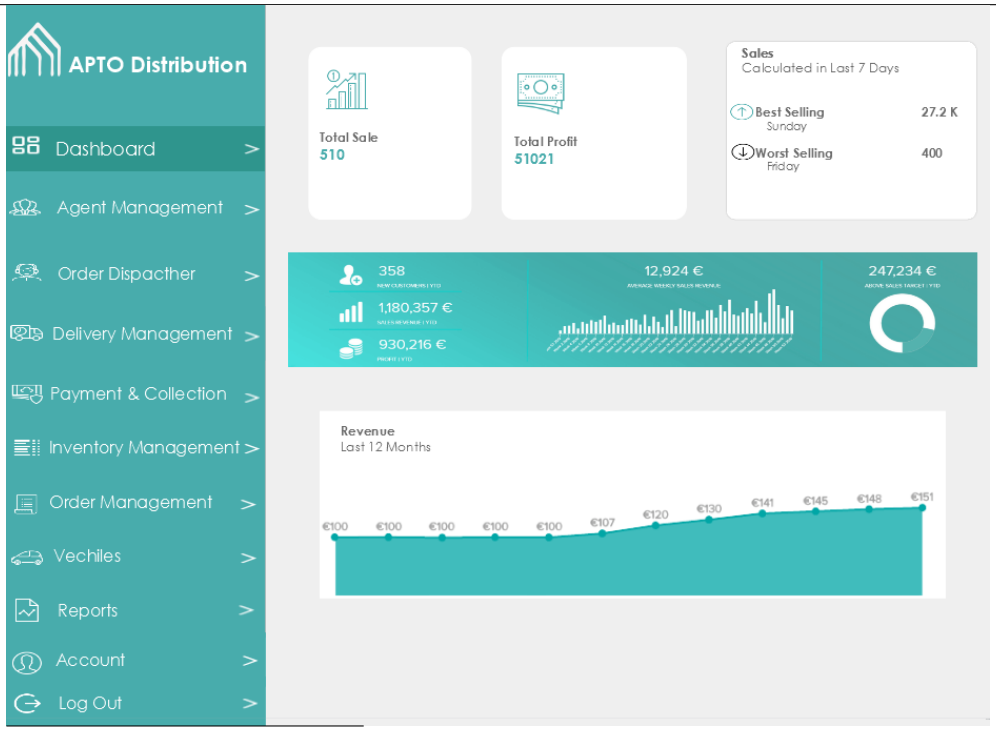
Interface ID	I12
Name	Admin Employee Order History Details
Linked Use Case	U12,U13 ,U14 ,U15
UI Screen (JustIn-Mind)	
Validators	NA

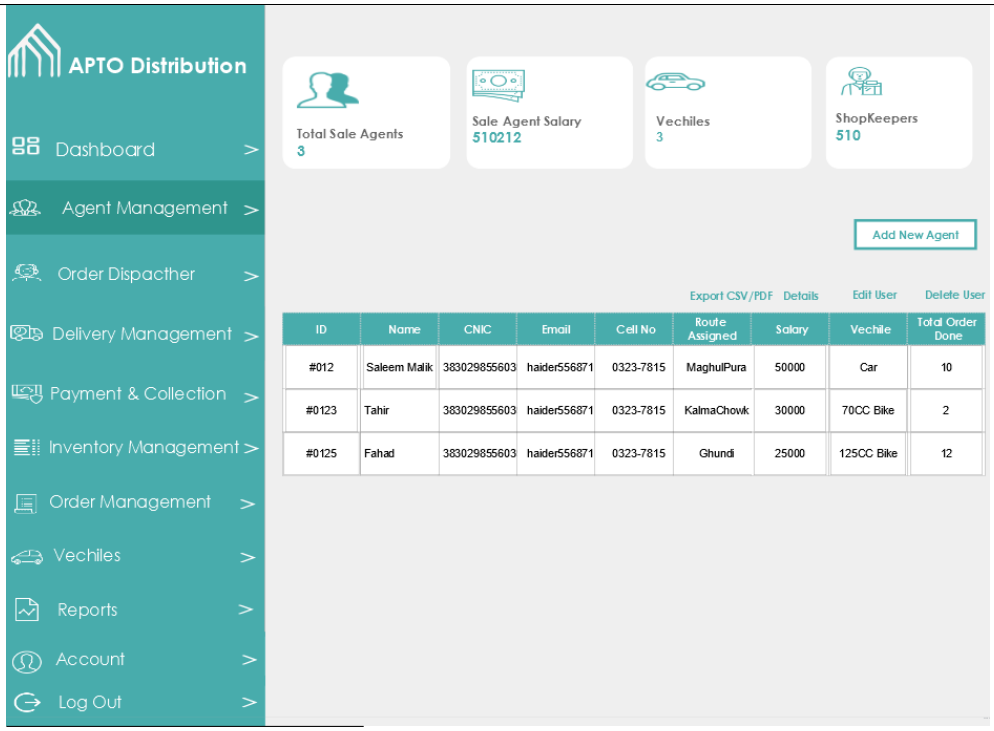
Interface ID	I13
Name	Admin Vehicle Window
Linked Use Case	U08, U09
UI Screen (JustIn-Mind)	
Validators	• Vehicle can only be added if there is money available

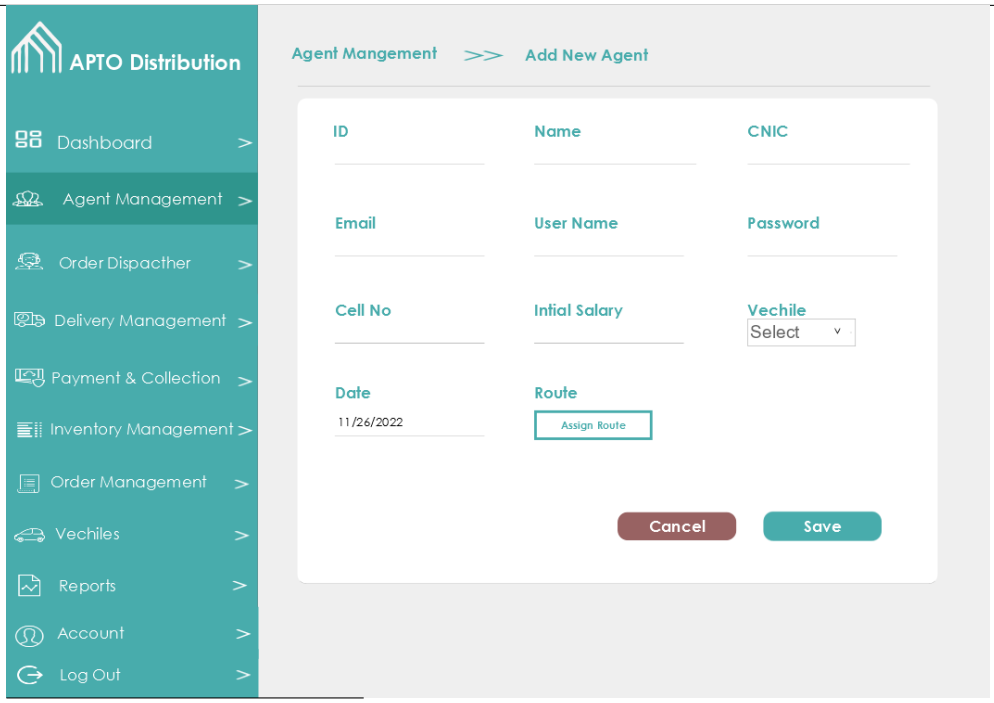
Interface ID	I14
Name	Admin Add Vehicle Window
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e V...(number) • Number should be like this MIK5425 • Price will be an integer

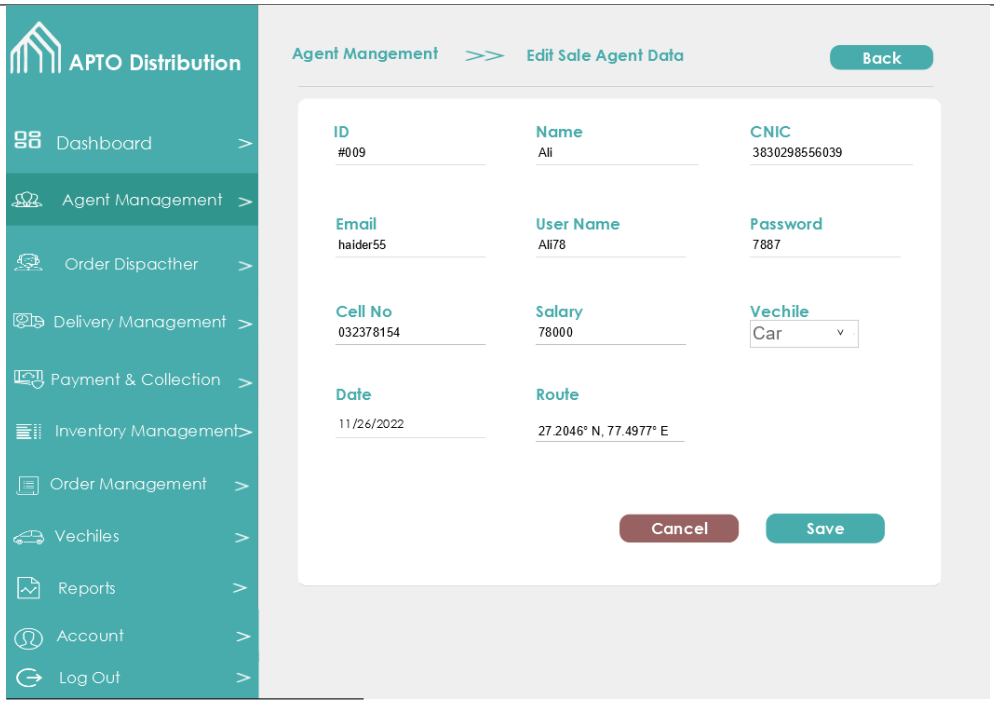
Interface ID	I15
Name	Admin Reports Window
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	NA

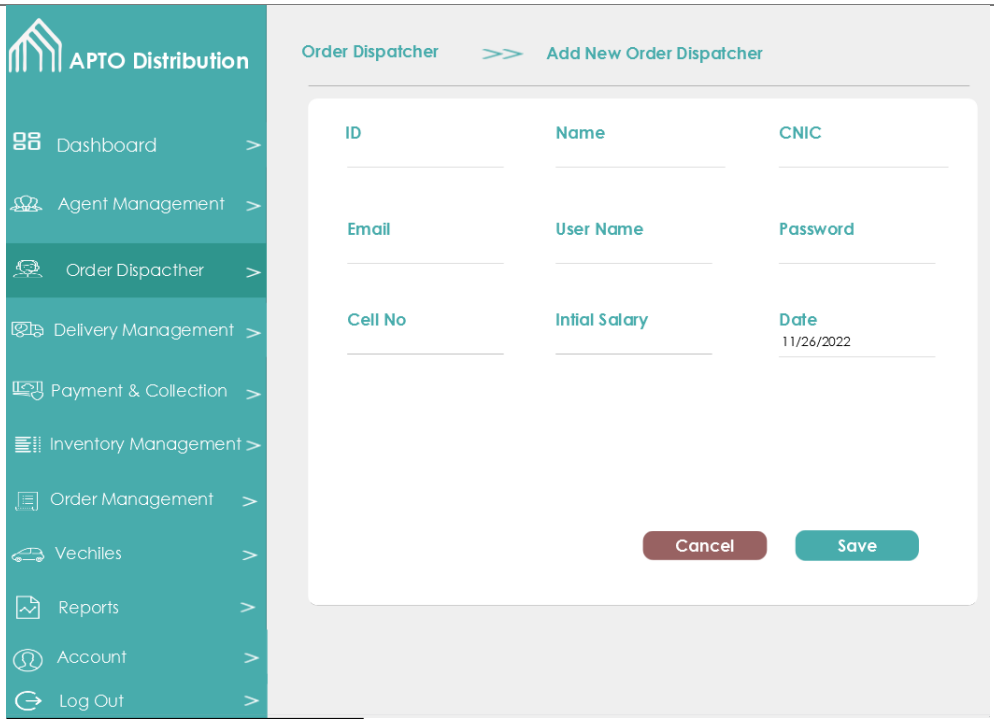
Interface ID	I16
Name	Admin Account Window
Linked Use Case	U08
UI Screen (JustIn-Mind)	
Validators	• User Name could be changed but it should not be already taken • Password should be of a minimum of 8 digits

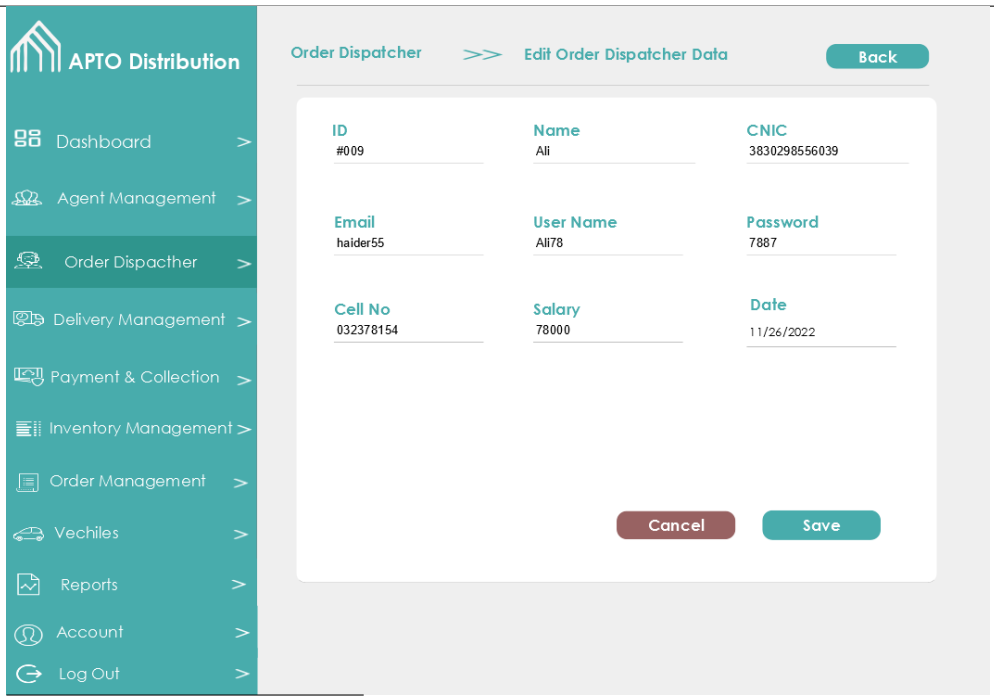
Interface ID	I17
Name	Manager DashBoard
Linked Use Case	U02, U03, U04, U05
UI Screen (JustIn-Mind)	
Validators	NA

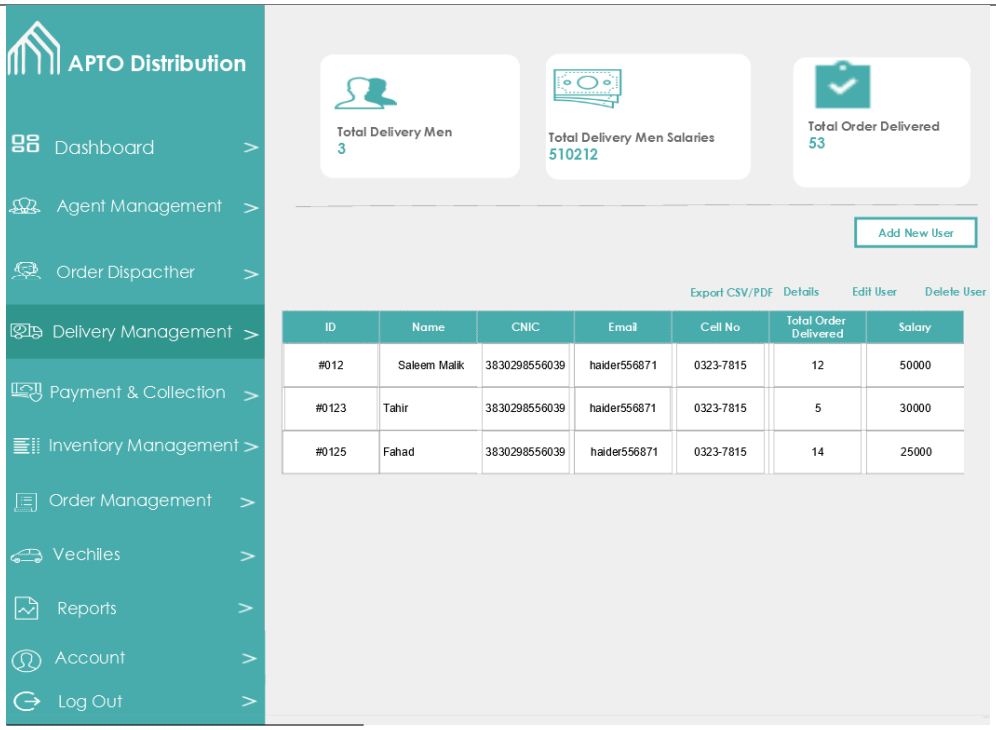
Interface ID	I18
Name	Manager Agent Management Window
Linked Use Case	U06
UI Screen (JustIn-Mind)	
Validators	

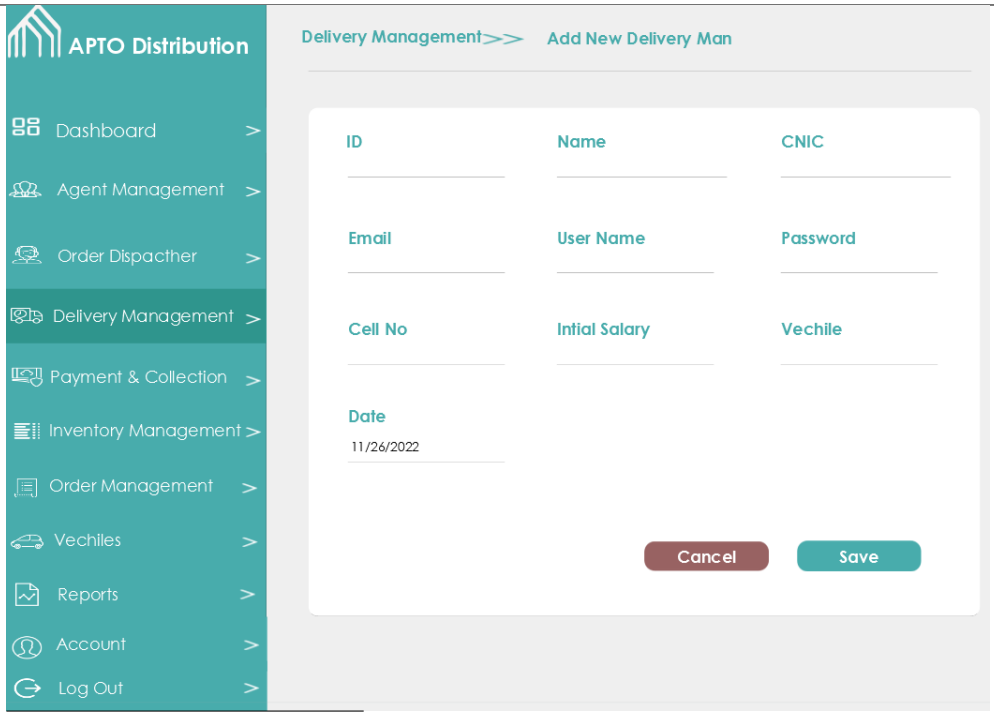
Interface ID	I19
Name	Manager Add Agent Window
Linked Use Case	
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e SA...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers • The vehicle can be selected from only the combo box • Email should be in correct form i.e abc@gmail.com

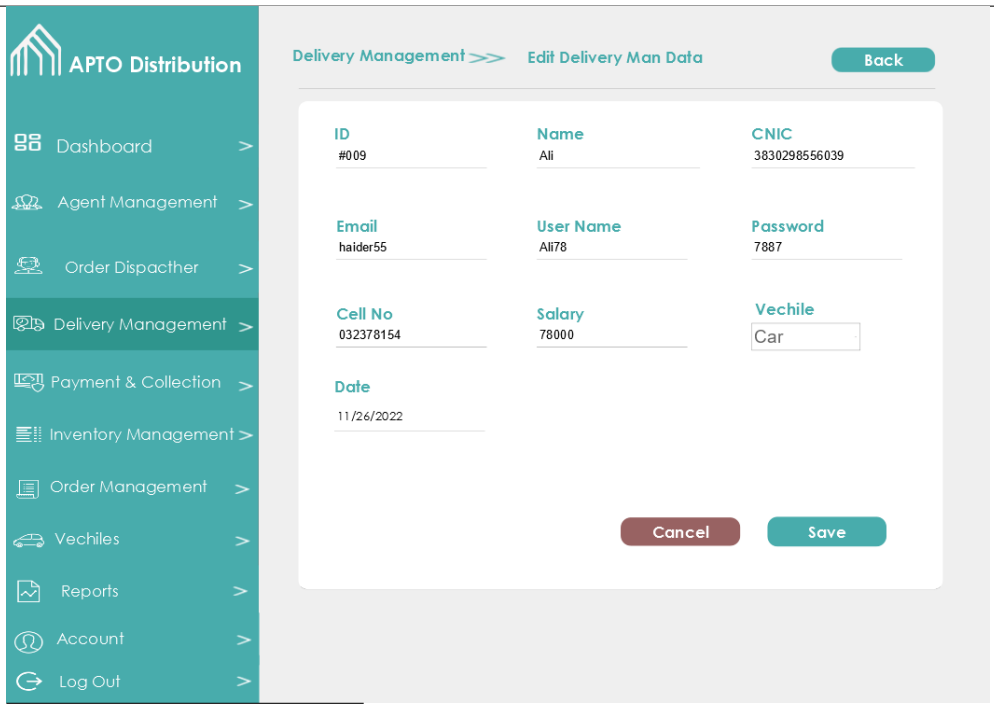
Interface ID	I20
Name	Manager Edit Agent Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e SA...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers • The vehicle can be selected from only the combo box

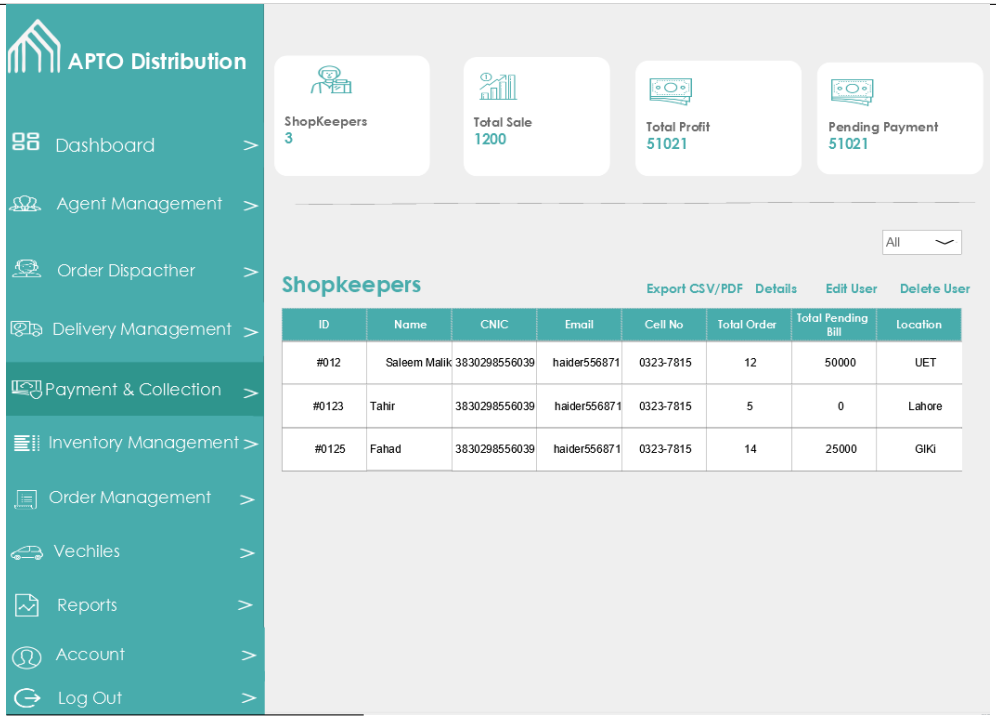
Interface ID	I21
Name	Manager Add Order Dispatchers Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e OD...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers

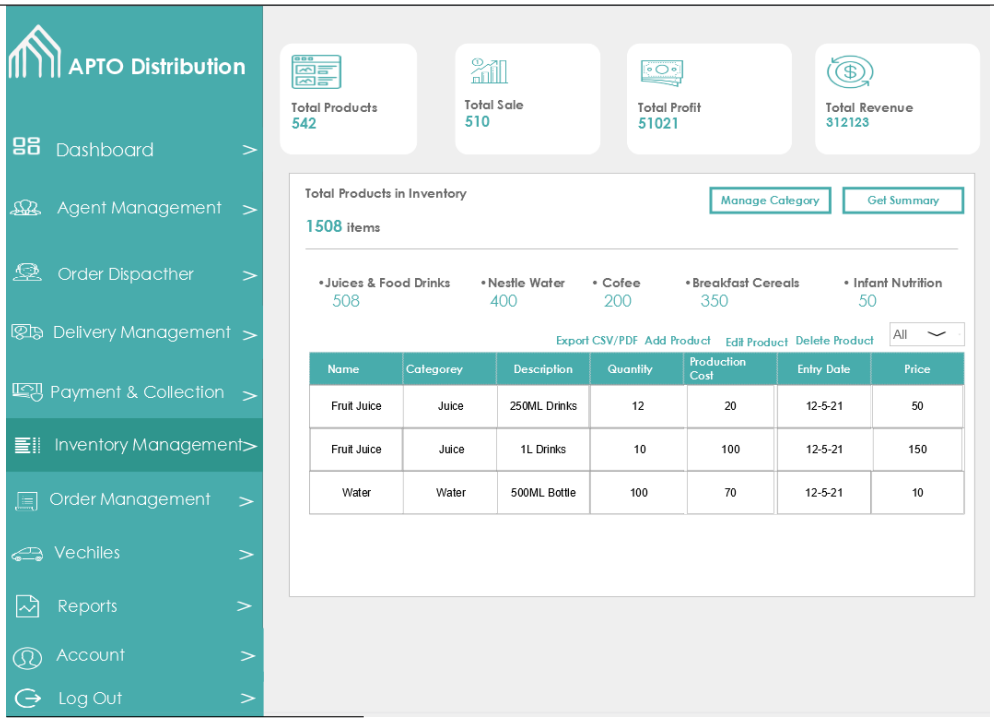
Interface ID	I22
Name	Manager Edit Order Dispatchers Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e OD...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers

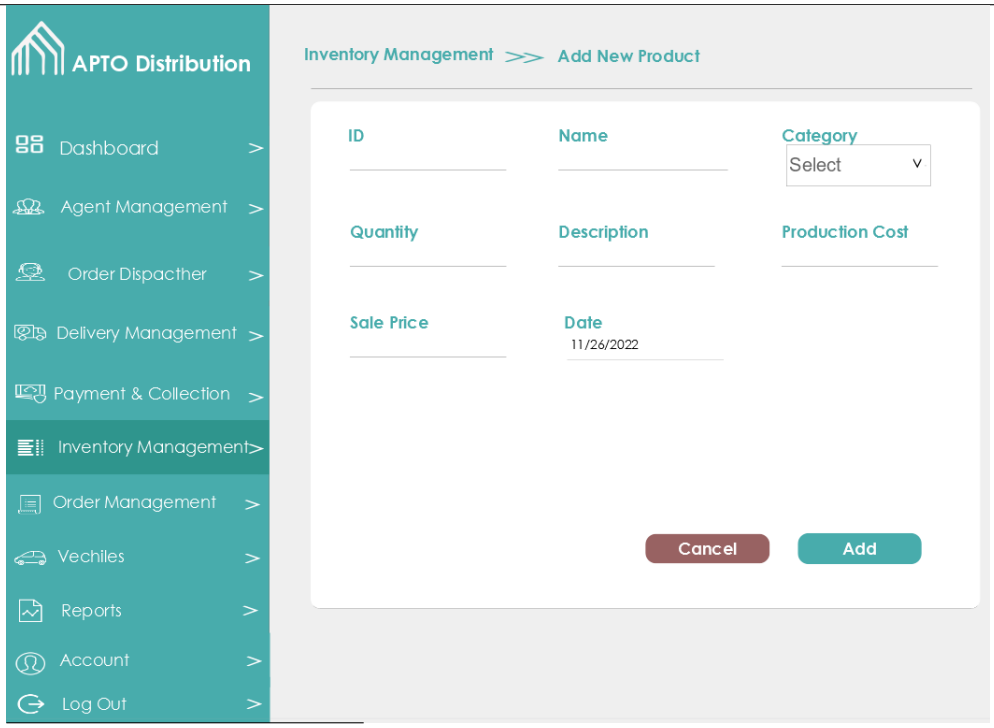
Interface ID	I23
Name	Manager Delivery Man Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

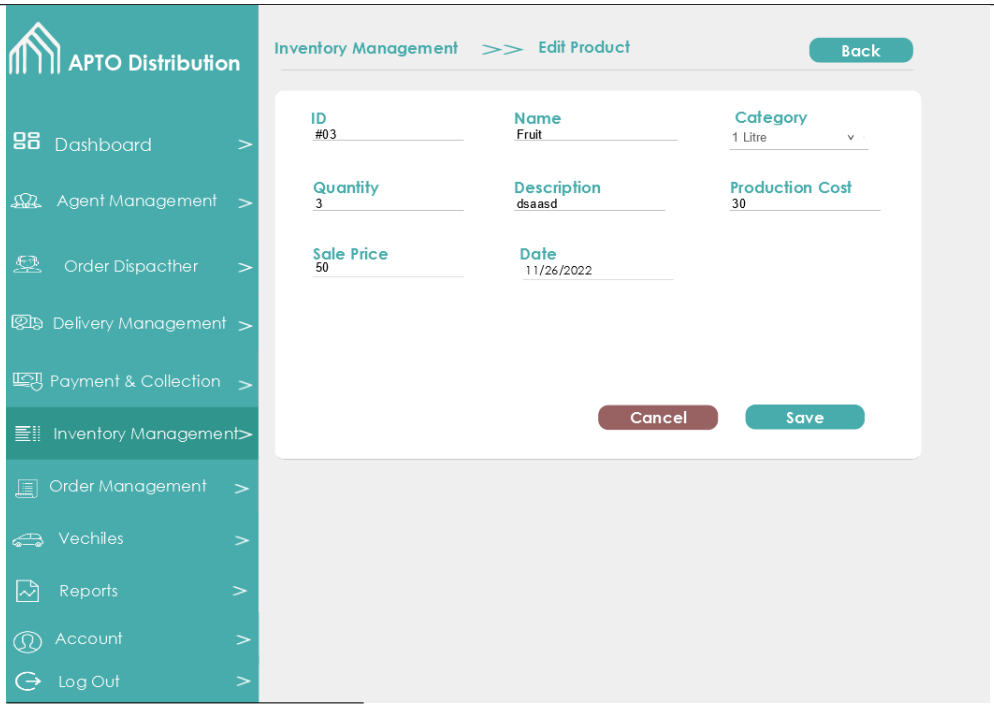
Interface ID	I24
Name	Manager Add Delivery Man Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e SA...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers • The vehicle can be selected from only the combo box • Email should be in correct form i.e abc@gmail.com

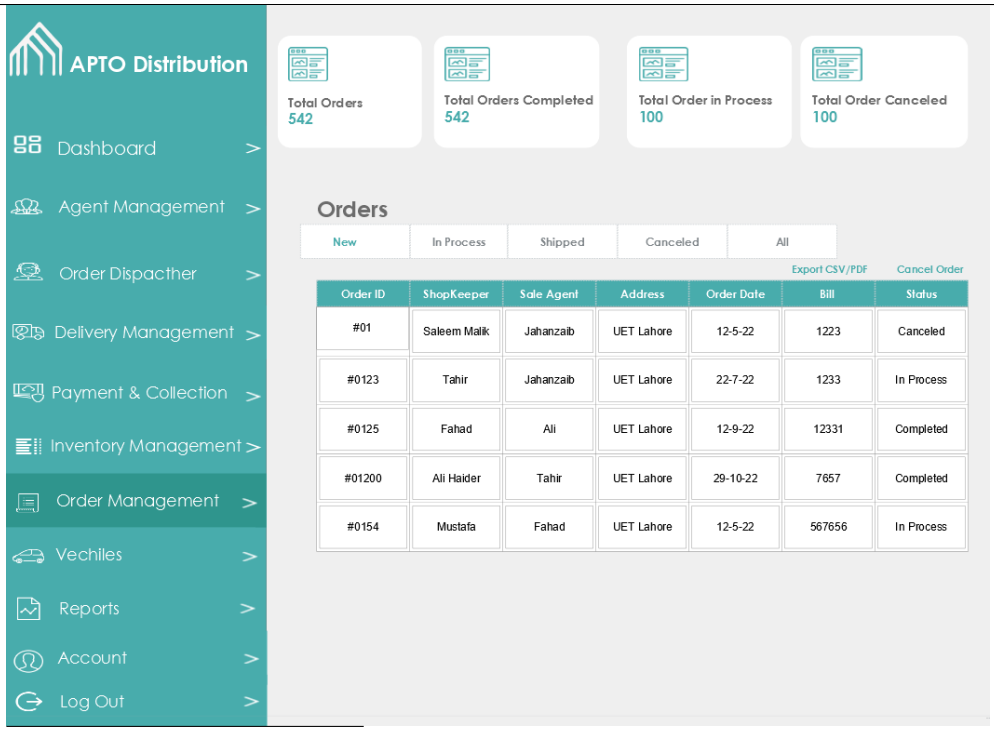
Interface ID	I25
Name	Manager Edit Delivery Man Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e SA...(number) • CNIC should be 13 digits without dashes • Email, UserName must not be already registered • Cell No should be 13 thirteen digits i.e +923237815502 • Salary should be in integers • The vehicle can be selected from only the combo box

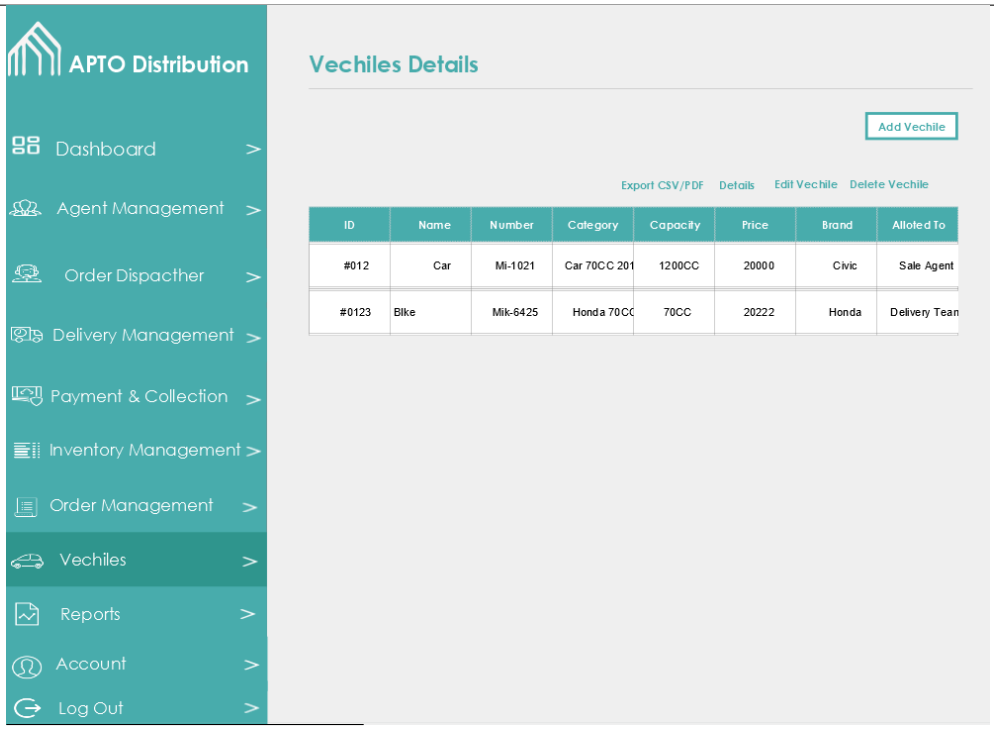
Interface ID	I26
Name	Manager Payment and Collection
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

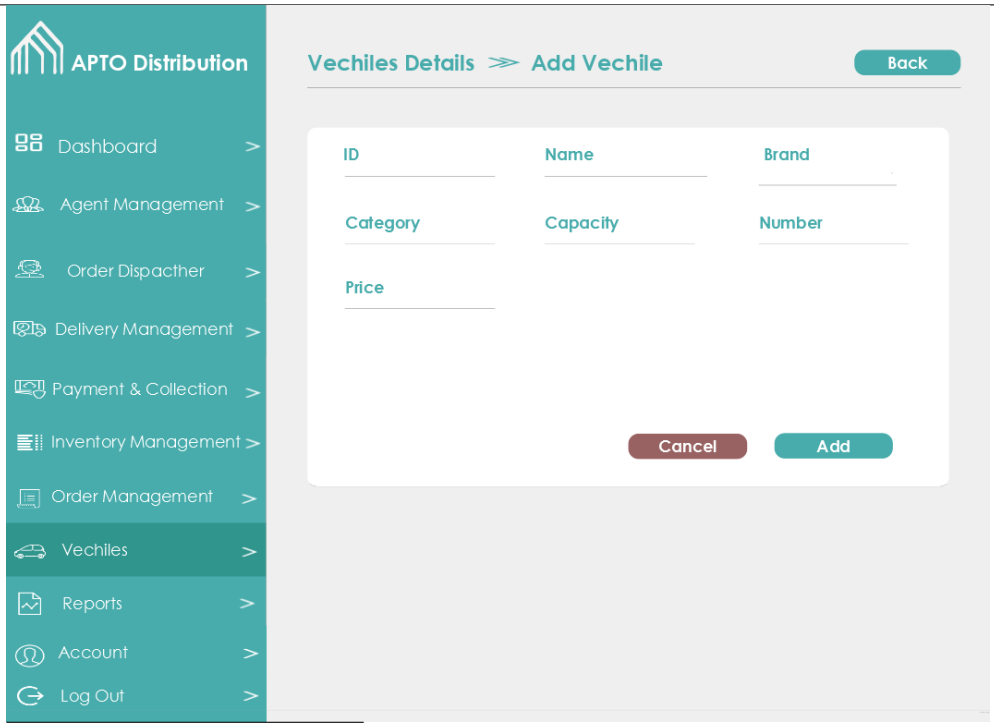
Interface ID	I27
Name	Manager Inventory Management Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

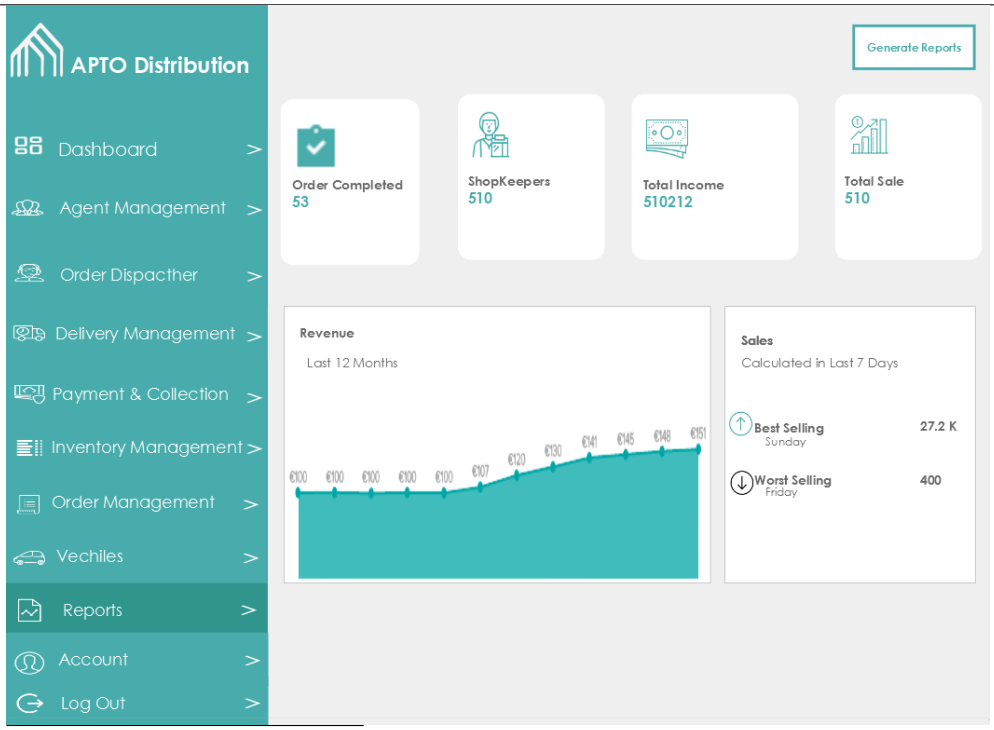
Interface ID	I28
Name	Manager Add Product Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e P...(number) • Quantity, Production Cost and Sale Price should be integers • The category can be selected from only the combo box

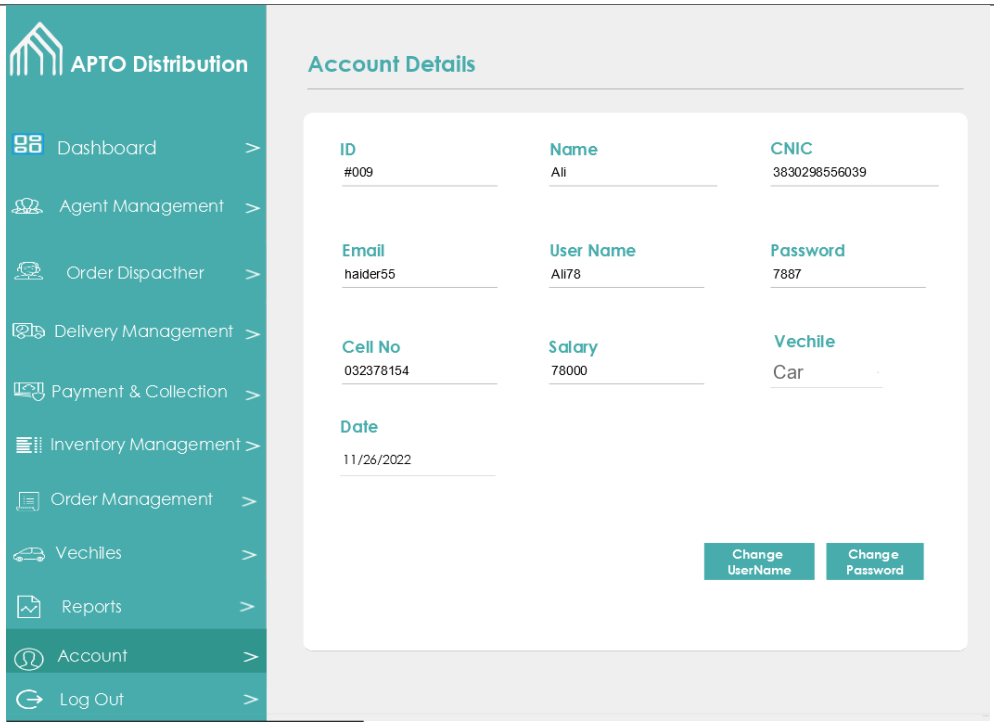
Interface ID	I29
Name	Manager Edit Product Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e P...(number) • Quantity, Production Cost and Sale Price should be integers • The category can be selected from only the combo box

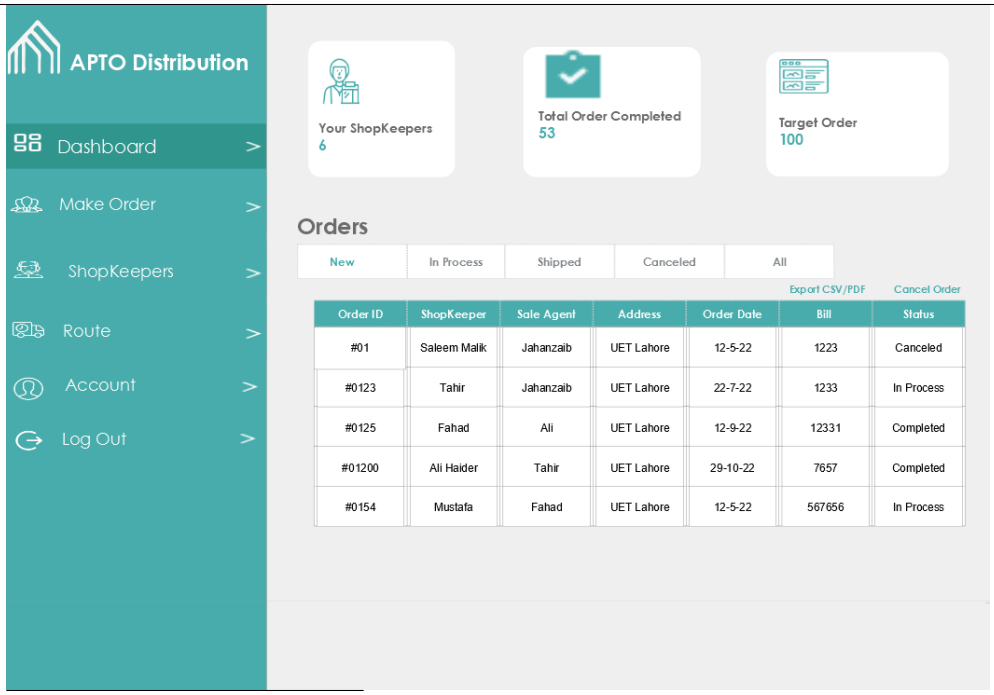
Interface ID	I30
Name	Manager Order Management Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

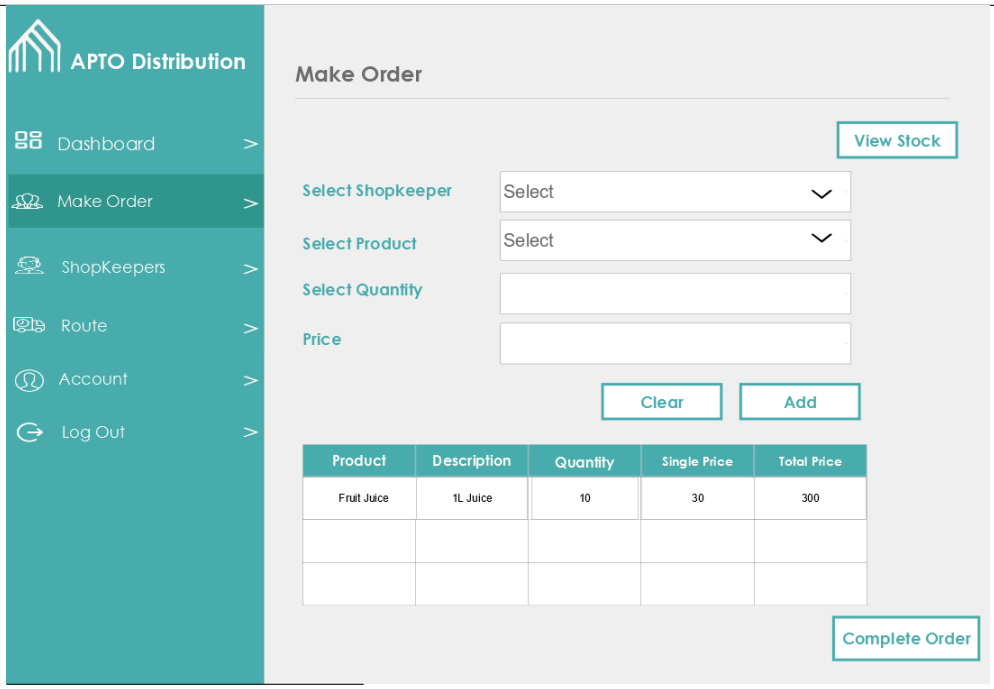
Interface ID	I31
Name	Manager Vehicle Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

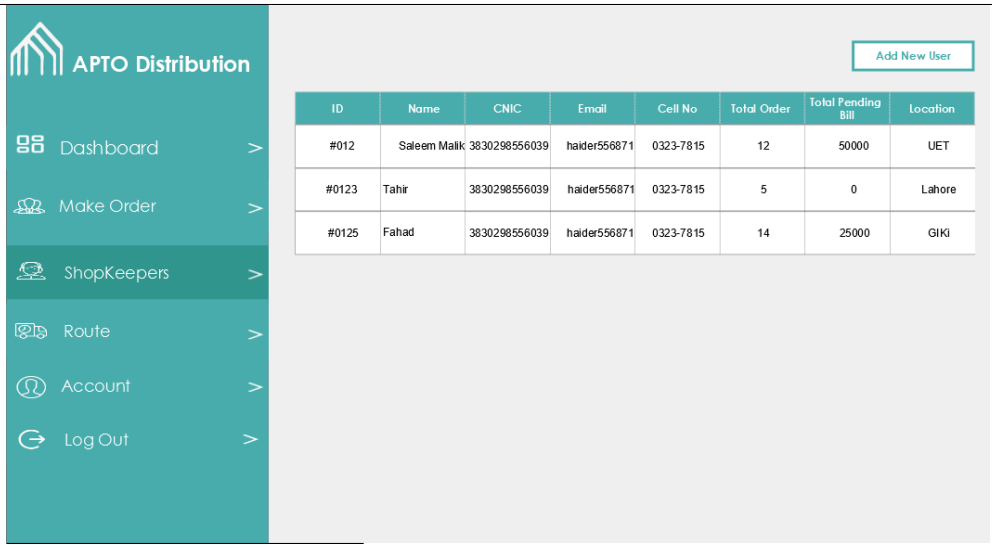
Interface ID	I32
Name	Manager Add Vehicle Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e V...(number) • Number should be like this MIK5425 • Price will be an integer

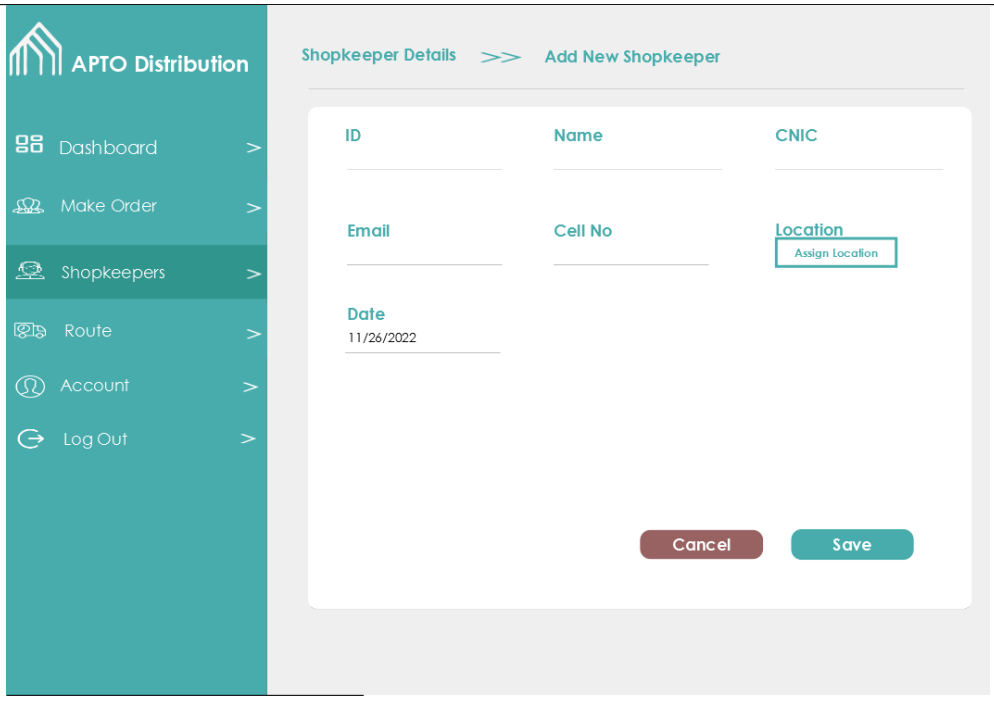
Interface ID	I33
Name	Manager Report Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

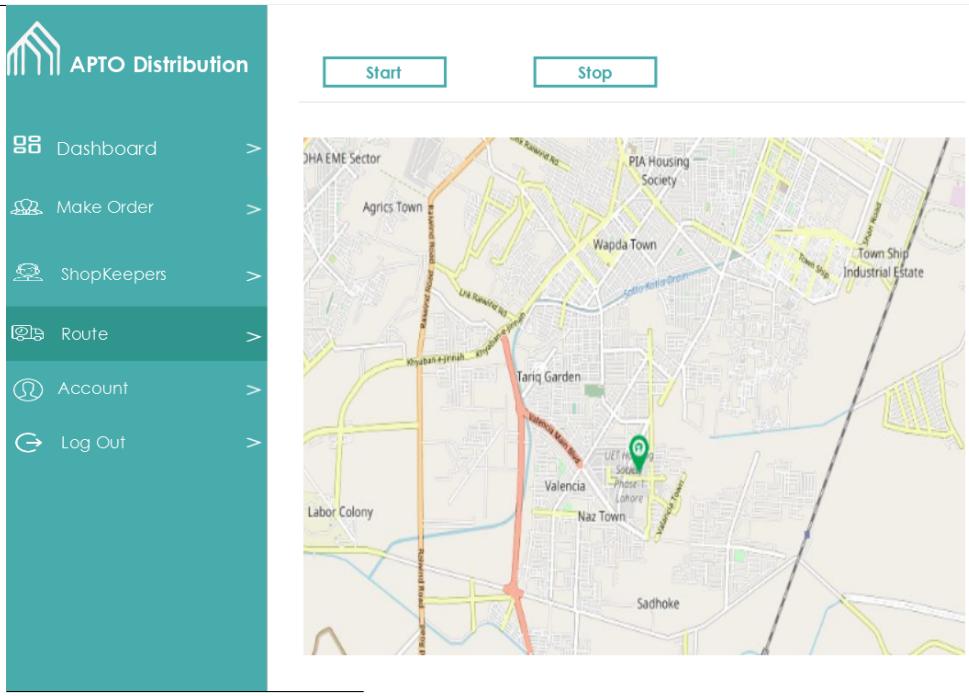
Interface ID	I34
Name	Manager Account Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

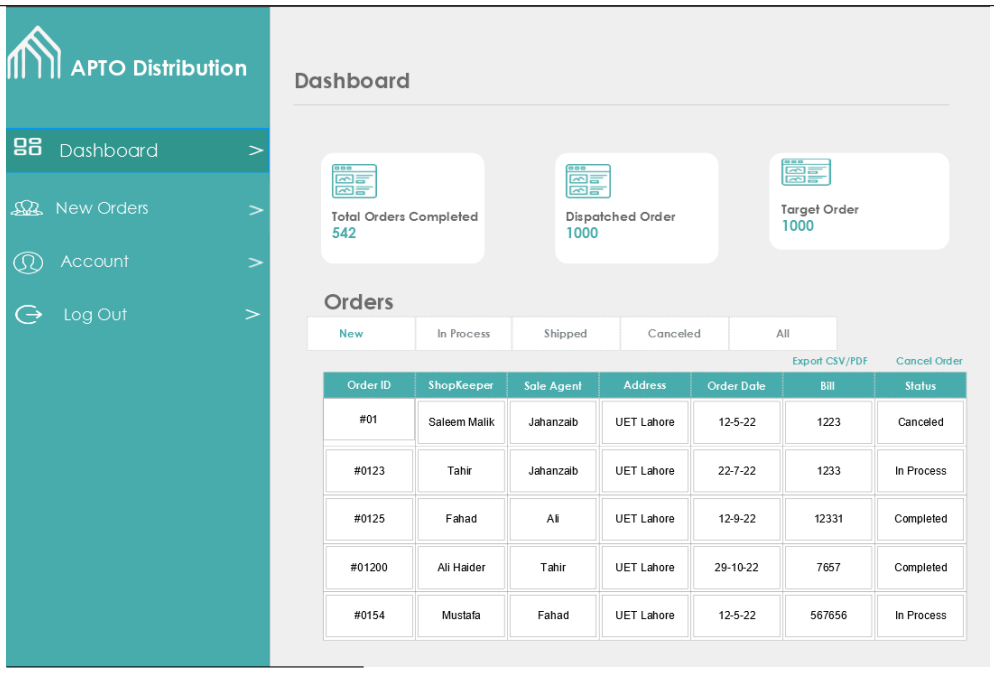
Interface ID	I35
Name	Sale Agent Dashboard
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

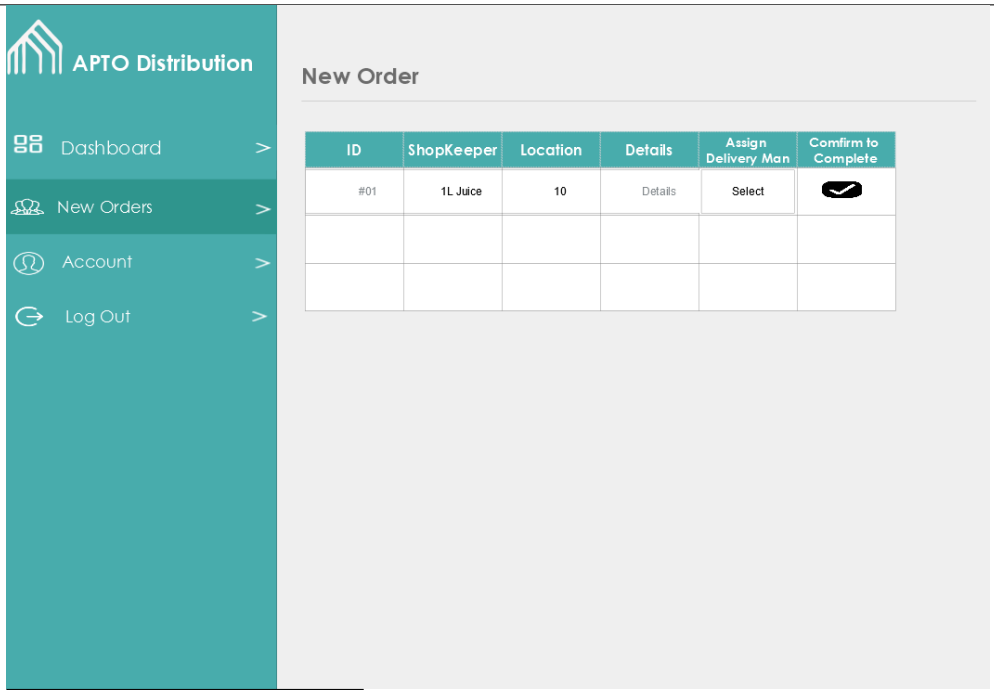
Interface ID	I36
Name	Manager Make Order Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• Quantity should be in integers and should be less than available product quantity

Interface ID	I37
Name	Sale Agent Shopkeepers
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e V...(number) • Number should be like this MIK5425 • Price will be an integer

Interface ID	I38
Name	Sale Agent Add Shopkeeper
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	• ID must be unique and according to format i.e SK...(number) • CNIC should be 13 digits without dashes • Email should be in correct form i.e abc@gmail.com • Cell No should consist of 13 digits i.e +923237815502

Interface ID	I39
Name	Sale Agent Route
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

Interface ID	I4
Name	Order Dispatcher Dashboard Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

Interface ID	I41
Name	Order Dispatcher Order Window
Linked Use Case	U10
UI Screen (JustIn-Mind)	
Validators	NA

7 User Interface Details

Interface ID	TextBox	Drop Down	Password Box	Table	Date Field	Buttons	Auto-Complete	Radio Button	CheckBox	Menu	Text Area	Progress Bar
I01	2	0	1	0	0	1	0	0	0	0	0	0
I02	0	1	0	0	0	5	0	0	0	0	1	0
I03	0	1	0	1	0	13	0	0	0	0	0	0
I04	0	1	0	1	0	10	0	0	0	0	0	0
I05	0	1	0	1	0	9	0	0	0	0	0	0
I06	0	0	0	0	0	6	0	0	0	0	0	0
I07	0	0	0	0	0	0	0	0	0	0	0	0
I08	0	0	0	1	0	5	0	0	0	1	0	0
I09	9	0	0	0	0	3	0	0	0	1	0	0
I10	0	0	0	1	0	5	0	0	0	1	0	0
I11	9	0	0	0	0	2	0	0	0	1	0	0
I12	0	1	0	1	0	5	0	0	0	1	0	0
I13	0	0	0	1	0	8	0	0	0	1	0	0
I14	0	0	0	0	0	1	0	0	0	1	0	0
I15	0	0	0	0	0	0	0	0	0	1	0	0
I16	1	3	0	1	0	4	1	0	0	1	0	0
I17	0	0	0	1	0	1	0	0	0	1	0	0
I18	0	0	0	0	0	2	0	0	0	1	0	0
I19	0	0	0	0	0	0	0	0	0	1	0	0
I20	0	0	0	1	0	0	0	0	1	1	0	0

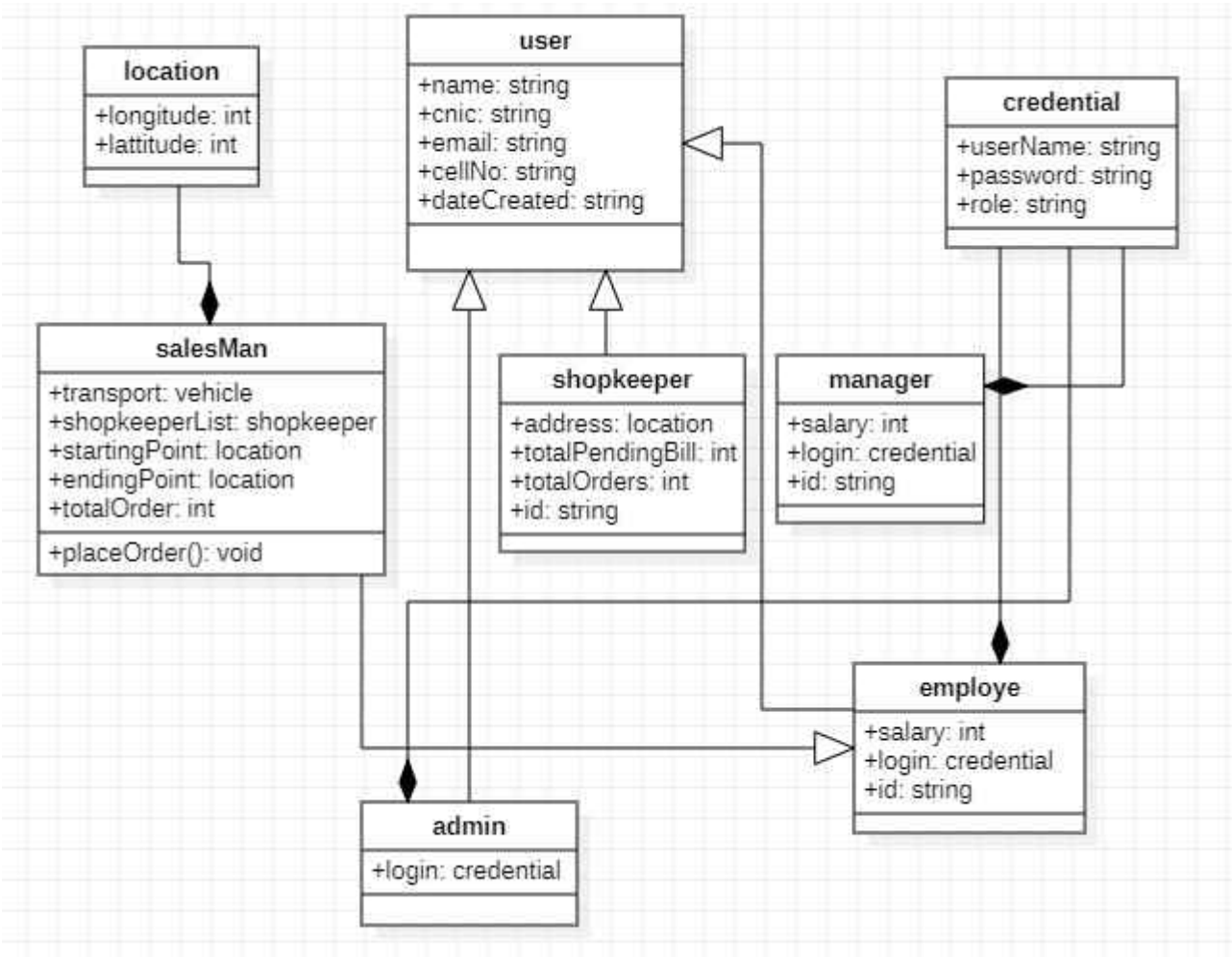
8 Classes:

Class Name	Software/Domain	Is Abstract (Yes/No)	Is Signeleton (Yes/No)	Is the class will has parametrized constructor (Yes/No)
user	Domain	No	No	Yes
admin	Domain	No	Yes	Yes
manager	Domain	No	No	Yes
employe	Domain	No	No	Yes
salesMan	Domain	No	No	Yes
orderDispatcher	Domain	No	No	Yes
delieryMan	Domain	No	No	Yes
shopkeeper	Domain	No	No	Yes
deliveryMan	Domain	No	No	Yes
ISalesMan	Software	Yes	No	No
product	Domain	No	No	Yes
vehicle	Domain	No	No	Yes
vechileDL	Domain	No	No	Yes
shopkeeper	Domain	No	No	Yes
shoopkeeperDL	Domain	No	No	Yes
order	Domain	No	No	Yes
productDL	Software	No	No	No
adminDL	Software	No	No	No
orderDL	Software	No	No	No
salesManDL	Software	No	No	No
managerDL	Software	No	No	No
shopkeeperDL	Software	No	No	No
Stack	Software	No	No	Yes
Queue	Software	No	No	Yes
LinkList	Software	No	No	Yes
Graph	Software	No	No	Yes
BST	Software	No	No	Yes
Spanning Tree	Software	No	No	Yes

9 Object Oriented Features:

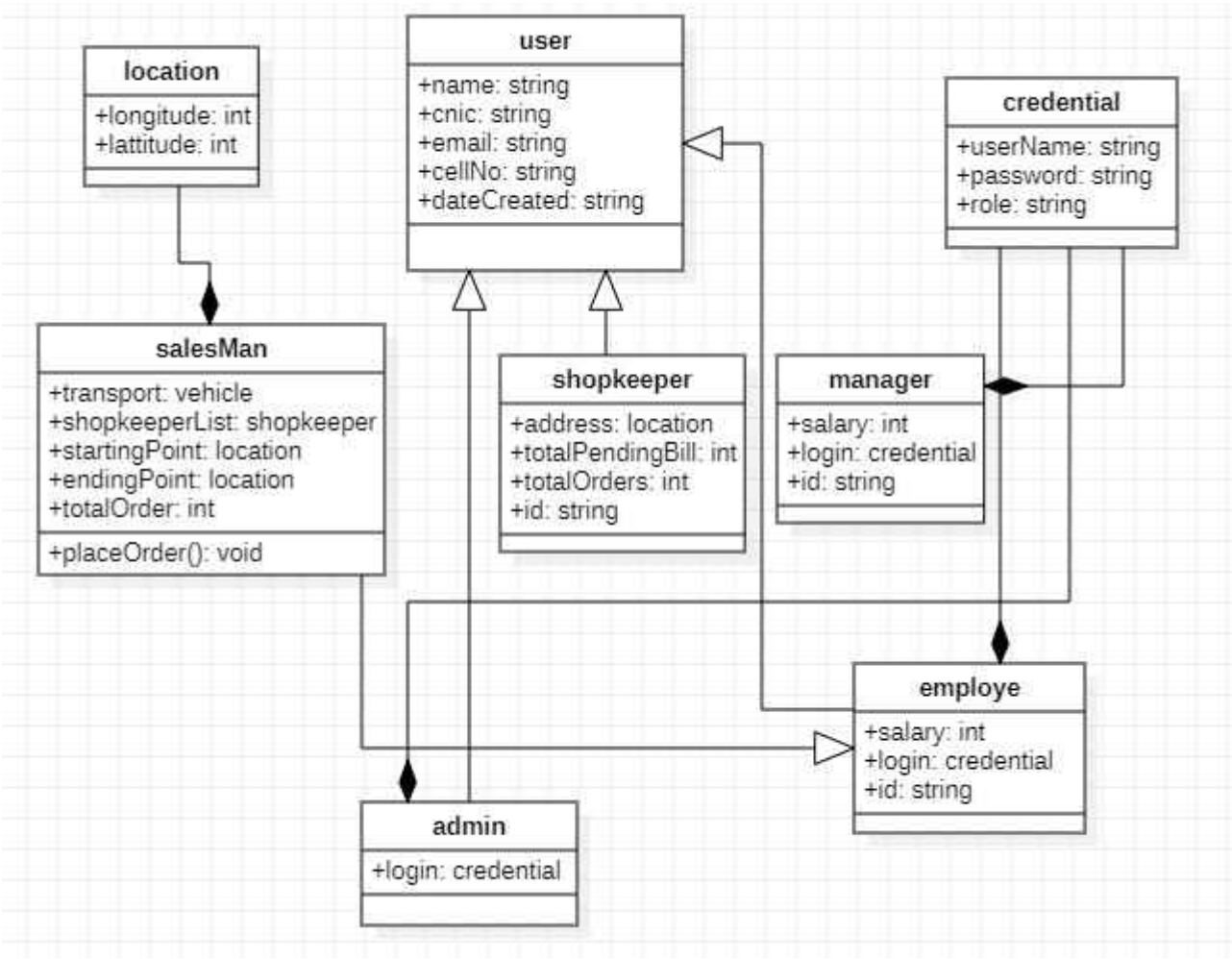
9.1 Composition:

Composition will be in different classes.
For Example: All the users except shopkeeper will be composed of credential class



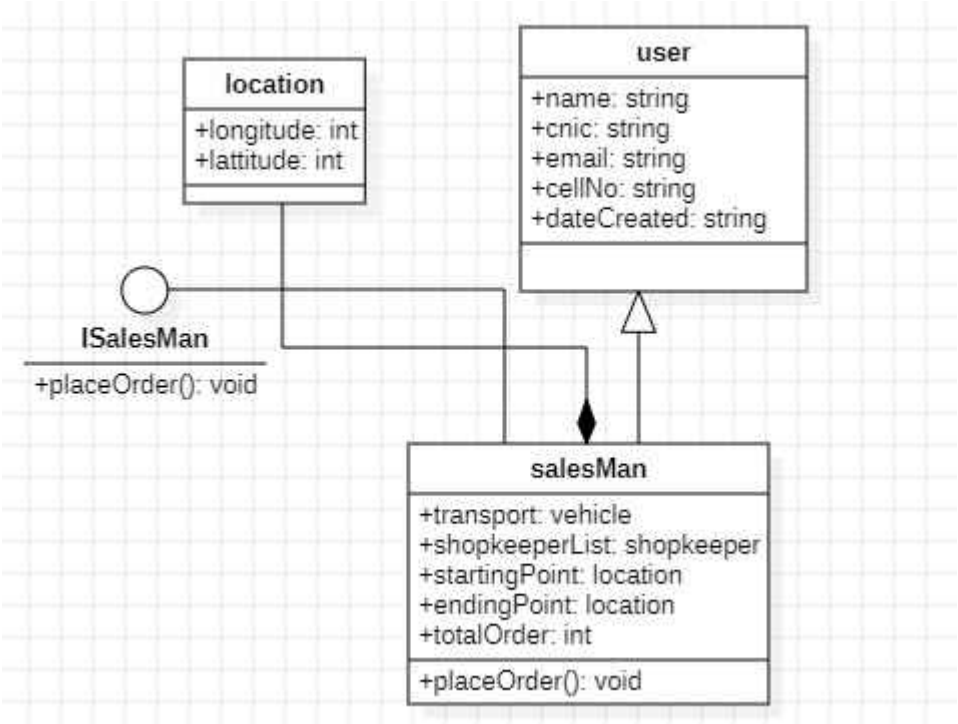
9.2 Inheritance:

User class will inherit admin, mnager, employe and shopkeeper class



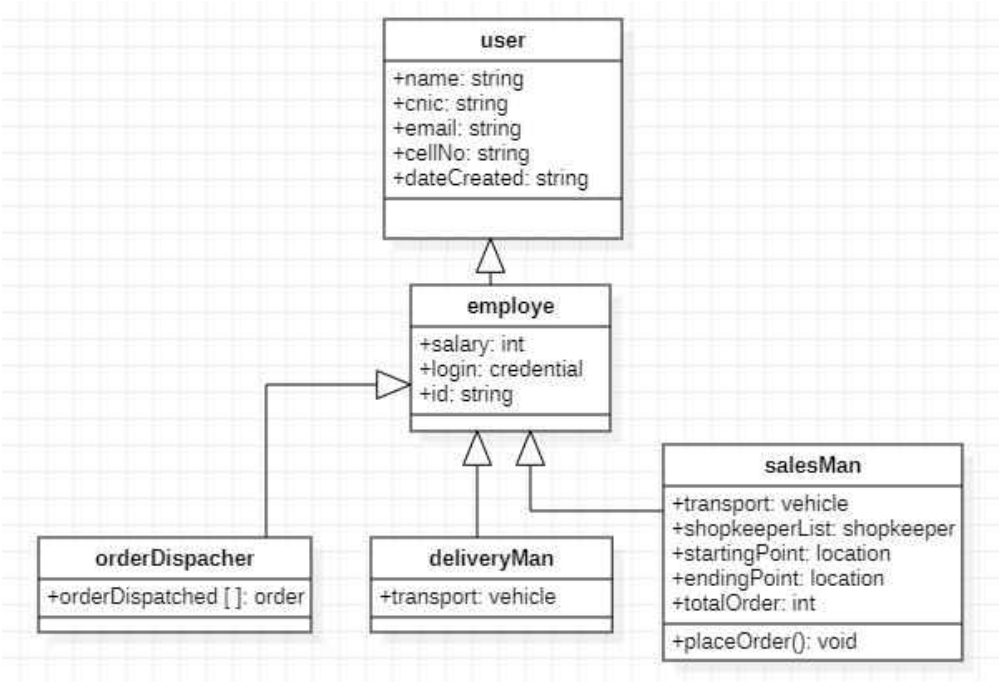
9.3 Multiple Inheritance:

SalesMan class will be child of user class and will extend ISalesMan class also

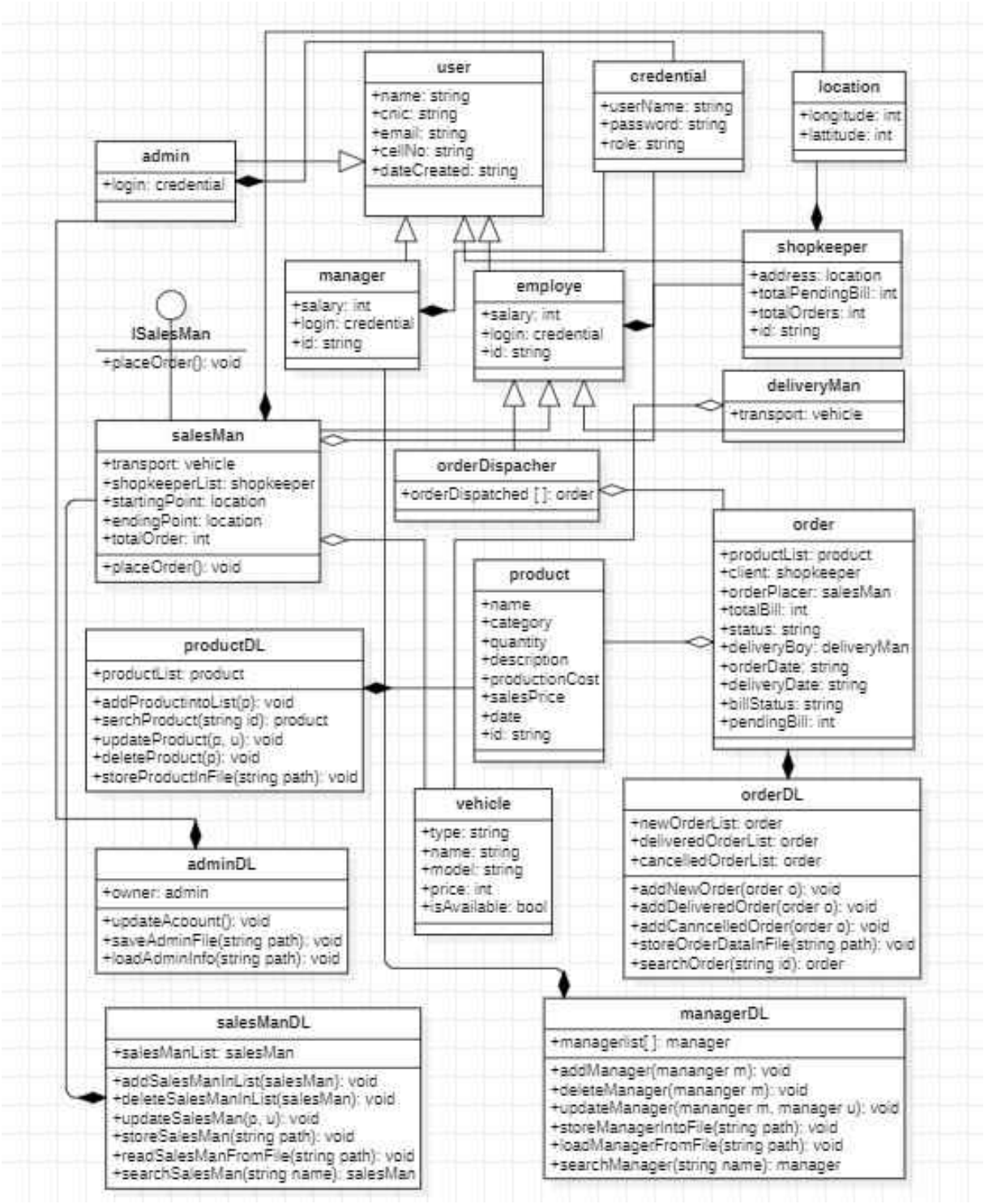


9.4 Multi-Level Inheritance:

User class inherit employe class and employe class will inherit salesMan, orderDispatcher,and deliveryMan class.



10 Detailed Object Oriented Design:



11 Data Structure:

Use Case Id	Data Structures Used	Justification for the usage of data structure
U08	Queue	When order is placed, we will use Queue because queue is first come first out so order placed first will delivered first
U10	Stack	For order delivered, we will use stack as latest delivered order will replaced first
U06	Graph	To find the shortest path, we will use graph
U10	List	We will use list of product in order class because they will always less in number
U12	Double Link List	There will be many products so linked best will be best for memory allocation
U02	Linked List	linked list is preferred because there is no limit of product to be added
U02	Linked List	linked list is preferred because there is no limit of employees to be added

12 Exceptions:

Type of Exception	Why this exception will occur	Use Case Id in which exception could be occurred	How you will handle the exception
Run Time	Invalid or Incomplete Data		Validations

13 Data Storage:

Data of the products, the Users, and orders that are not completed yet.The data of the products, users and orders will be read when application starts and is stored when the application closes. The data of the above mentioned item will be stored when the item is added, updated or deleted.The data of above mentioned will be stored in **CSV** format.

14 Email Sending:

When order is placed,marked as ready, and dispatched, the Sales Team, Delivery Team, and Shopkeeper will get system auto-generated email.This email will show the status of order along with date, and order Tracking ID. When any user click on forget password, the user will get email to change password containing new auto-generated password from the system.

15 Project Plan:

Use Case Id	Use Case Name	Member Name	Estimated Completion Date
U01	Login User	Ali Haider	28-11-2022
U02	Add Users	M Tahir	03-11-2022
U03	Update User	Fahad Karim	03-11-2022
U04	Delete User	Ali Haider	03-11-2022
U05	Retrieve Users	M Tahir	05-12-2022
U06	Assign Route to Delivery Team	Fahad Karim	11-12-2022
U07	View Delivery Team Position	Ali Haider	12-12-2022
U08	Place Order	M Tahir	13-12-2022
U09	Cancel Order	Fahad Karim	13-12-2022
U10	Mark Order as Delivered	Ali Haider	14-12-2022
U11	Dispatch Order	M Tahir	15-12-2022
U12	Add Product	Fahad Karim	16-12-2022
U13	Update Product	Ali Haider	16-12-2022
U14	Retrieve Product	M Tahir	17-12-2022
U15	Delete Product	Fahad Karim	17-12-2022
U16	Delivery Team Position	Ali Haider	17-12-2022

16 Analytical Reports

Admin/Owner and Manager can generate reports of data in tabular form and graph form. They can download file in csv file and in pdf file. Following reports can be downloaded

- All Employees
- All Orders (all, completed, in process, canceled)
- All Products (Category Wise)
- Monthly, Weekly Sales
- Sales by specific Sale Agent
- Most sold product
- Sale Revenue
- Orders per Date
- Most Sales per Day