



The University of Lahore

Department of Computer Science & IT

**“A software product line for the analysis
of the sales and services provided by the
dealership of an automobile
manufacturer”**

Abstract

This project is based on analysis of data for the automobile manufacturer. The manufacturer has their portal by which they get data of customers from the dealership, sending the questionnaire form to the customers. This data is analyzed and help to find the problem and its solution. It is easy way to judge the problems or flaws in automobile. With this project, manufacturer can increase their revenue and reputation. Also they judge their dealers whether they work efficiently or not.

DEDICATION

Every challenge needs selfless efforts as well as guidance of elders, especially those who are very close to our heart. We dedicate it to our parents for their endless love, support and encouragement throughout our life.

Acknowledgement

All praises to Almighty Allah who bestowed upon us his blessing, which enable us to accomplish this documentation objectively and successfully.

We pay our deepest gratitude with deepest sense of respect to our parent whose love and affection kept us steadfast and enable us to attain target and goal of academic life. We are extremely indebted to our loving brothers and sisters whose constant encouragement provided us with the impetus that was necessary for attaining academic initiatives.

We owe sincere gratitude to our supervisor "**Mr. Usama Liaquat**" who extended every possible cooperation, guidance and advice during the completion of this work, without whose cooperation this project can never been materialized.

Thanks are also to our teacher of department for their encouragement and co-operation.

We shall always keep on record the nice company provided to us by our friends and the cherished happy moments spent with them.

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Chapter 1: Introduction to the Problem



Introduction

The automobile industry in the country is one of the key sectors of the economy in terms of the employment opportunities that it offers. The gap between the customers and automobile manufacturers growing day by day and has worried the manufacturers. This state of affairs has triggered a lot of cutthroat competition and consolidation in the industry. Cost reduction initiatives have come to be the in thing in the global industry today.

Now we build the portal for the automobile manufacturer so they get data of customers from the dealership and by sending the questionnaire form, it may be sent by email and customer fill this form and send it directly to manufacturer. Also the manufacturer will directly contact to customer by their phone number and fill the customer form itself by get the customer feedback at customer convenience. This data is analyzed and will help the top management to diagnose the problems, to assist them in strategic decision making process.

Purpose

For any automobile maker, it is quite difficult to evaluate the performance of its dealerships. We propose a customized software product line for the automobile makers to support them in the process of analyzing the quality of sales and services provided by their dealers.

The customers give feedback based on questionnaire regarding their experience with a particular dealership. The automobile manufacturer will perform data analysis using our solution in order to rank its dealers and to enhance their services and increase their revenue and reputation in industry. This data is analyzed and will help the top management to diagnose the problems, to assist them in strategic decision making process.

Objective

The objective of this project is to build a Portal for the Automobile Manufacturer. This Portal has three categories

- Manufacturer
- Dealers
- Customers

Through this portal manufacturer get detail of customer from dealers. Then the manufacturer will send questionnaire form will send directly to the customers by email and the customer will give feedback to manufacturer and the manufacturer analyze their sale and services. This data analysis will help to find the problem in automobile industry.

Existing Solution

To the best of our knowledge and information there exists no such solution in Pakistan.

Proposed Solution

We make a software product line that is used to analyze the data which is generated as the result of sales and services provided by the dealership of an automobile maker. The dealers have to provide the customer leads to the auto-maker. The automaker contacts the customers and give them opportunity to provide feedback either through web based survey or via telephone. There is a check in system which checks whether the form is filled through email by the customer itself or through the telephone by the admin. The automobile manufacturer then process this data using our system. Our system provides the users of this product data analysis capabilities so that they can monitor the performance of their dealerships in order to improve their sales and services. With this, the industry will grow and the company will enhance their revenue, reputation and quality.

Chapter 2: Software Requirement Specification



Introduction

Purpose

For any automobile maker, it is difficult to evaluate the performance of its dealerships. We make customizable software product line for the automobile makers by which they can analyze the sale and services of their dealership. For this we make a portal through which the automobile maker send a questionnaire form directly to their customer and take feedback from their customer about the dealer, product and services. The customers give feedback based on questionnaire regarding their experience with a particular dealership.

The automobile maker perform data analysis based on the customer's feedback in order to check their dealers dealing and enhance their services. By this data analysis, the automobile maker check their dealers performance and also check that whether their dealers perform their duty or not and check what behavior of their dealers is to the customer's.

This data analysis will increase the company's revenue and their reputation in market. By performing this analysis the top management will easily diagnose the problems. In addition, this analysis will help the decision management to make decision regarding their customer's and their dealers.

This analysis will also help the customer's to tell their problem directly to top management regarding any dealer. By this, the customer satisfaction increase and the company increase their number of customer and find out what behavior of their dealers with their customer's. Through this the company also judge the performance of their dealers.

We make our framework customizable so there is no limit to use this software in automobile industry. All automobile industry manufacturer it may be Honda, Toyota or others all of them may use our software for the sales and services provided by the dealership.

We also use customizable framework so we can easily change the front end of the software without changing or building the whole software again. This benefit gives our software a big advantage to change layout of software and update it easily.

Scope

We make a web-based portal is based on software product line for the analysis of sales and services provided by the dealership of an automobile maker. The dealers have to provide the customer data to the automobile maker. The automobile maker contacts the customers and give them opportunity to provide feedback of our product either through portal or via telephone. Our software provides the users of this product data analysis capabilities so that they can monitor the performance of their dealerships in order to improve their sales and services. With this analysis, the industry will grow and the company will enhance their revenue, reputation and quality.

Definitions, acronyms, and abbreviations

- SPL: Software Product Line
- OLAP: Online Analytical Processing Server
- MySQL: My Structured Query Language
- HTML: Hyper Text Markup Language
- CSS: Cascading Style Sheet
- PHP: Hypertext Preprocessor
- CRUD: Create, Read, Update, Delete

References

- Swagbucks.com. (2018). *Put cash back in your wallet with Swagbucks!*. [online] Available at: <http://www.swagbucks.com/> [Accessed 17 Nov. 2018].
- MySurvey. (2018). *Paid Surveys – MySurvey.com – Make Money Online*. [online] Available at: <https://www.mysurvey.com/> [Accessed 15 Nov. 2018].

Overview

The automobile industry is a wide range of companies and organizations involved in the design, development, manufacturing, marketing, and selling of motor vehicles, some of them are called automakers. It is one of the world's largest economic sectors by revenue.

In software product line for the analysis of the sales and services provided by the dealership of an automobile manufacturer. There are Two Types of Functionalities Performed One from user side and other from manufacturer side.

Manufacturer

- Make questionnaire form
- Contact to customer by their phone number
- Analyzed the data
- Diagnose the problems

Dealer

- Send customer detail to manufacturer
- Check their reports

Customer

- Fill questionnaire form and give their feedback regarding to dealer

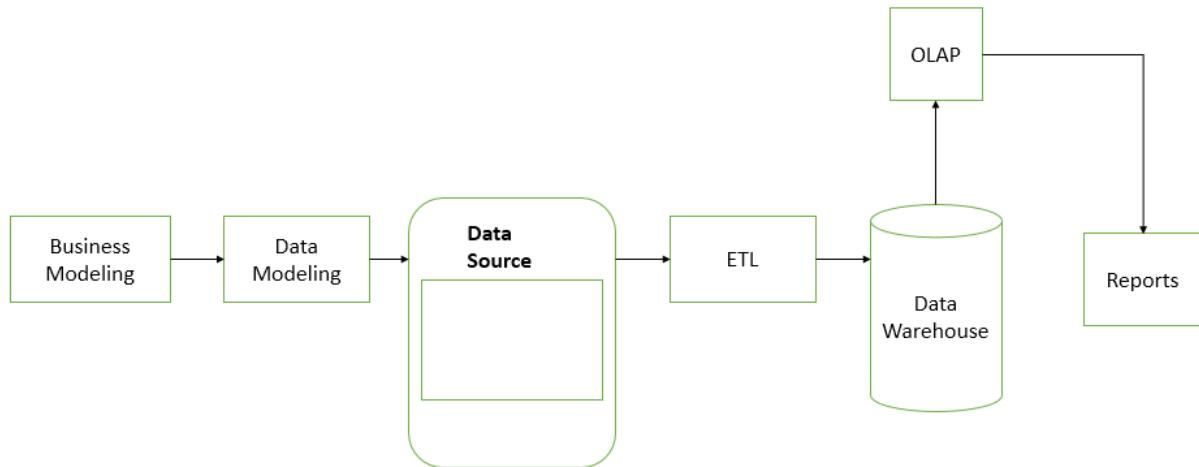


Overall Description

Product Perspective

We make a web-based portal is based on software product line for the analysis of sales and services provided by the dealership of an automobile maker. It will use open source technologies like MySQL, PHP, and Bootstrap.

Block diagram showing the major components of our system



System Interface

Database required for our Software for generating the reports such as benchmark report and ranking report etc. in order to analyze the data.

User Interface

The user interface of our portal is very simple and easily accessible. We aim to design it in such a way that administrator and dealer would be able to use it without any difficulty. Interface consists of all the basic requirements that need to be fulfilled before accessing any system e.g. log in and log out etc.

Hardware Interface

Personal Computer or Laptop with internet connection to run Portal.

Software Interface

Google Chrome, Mozilla Firefox and Safari Browser or any Browser.

Operations

The basic operation of our software is send form to customer according to customer type and customer fill this form and send to company. The major task of our software is after sending form from customer as a feedback then software will generate different reports such as benchmark report and ranking report etc. Then manager will analyze the reports based on the customer's response.

Product Functions

Account Registration Module:

The account registration module includes the following functional requirements:

ID:	FR_01			
Name:	Create Account			
Description:	Input	Output	Requirements	Basic Work Flow
Enter details to create account	First Name Last Name Email CNIC Phone# Area City Username Password	Account created	Internet connectivity required	Enter the correct information and click submit button in order to save the record in database

ID:	FR_02			
Name:	Delete Account			
Description:	Input	Output	Requirements	Basic Work Flow
Enter email/id to delete an account	Email/ID	Account deleted	Internet connectivity required	Login into admin account and search the account which you want to delete and click the delete button and the account is successfully deleted

ID:	FR_03			
Name:	Update Account			
Description:	Input	Output	Requirements	Basic Work Flow



Enter new details to update account	First Name Last Name Email CNIC Phone# Area City Username Password	Account updated	Internet connectivity required	Enter the correct information and click update button in order to update the record in database
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ID:	FR_04			
Name:	Login Account			
Description:	Input	Output	Requirements	Basic Work Flow
Login into account	Username/Email, password	Account logged in	Internet connectivity required	Enter registered email in email field and password in password field to successfully login

ID:	FR_05			
Name:	Logout Account			
Description:	Input	Output	Requirements	Basic Work Flow
Logout account	Null	Account logged out	Internet connectivity required	Press logout button to log out your account

Form Creation Module:

The form creation module includes the following functional requirements

ID:	FR_06			
Name:	View Form			
Description:	Input	Output	Requirements	Basic Work Flow



View Form	Click on Form type	View form	Internet connectivity required	Click on form type to view form
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ID:	FR_07			
Name:	Update Form			
Description:	Input	Output	Requirements	Basic Work Flow
Update according to new information	Questions, Choices	Form updated	Internet connectivity required	Enter the new information based on the customer to update the form

ID:	FR_08			
Name:	Send Form			
Description:	Input	Output	Requirements	Basic Work Flow
Sending a form to a customer	Type	Send form successfully	Internet connectivity required	Sending a form to a customer according to their type by pressing the send button

Generating Reports Module:

The generating reports module includes the following functional requirements:

ID:	FR_09			
Name:	Generating Reports			
Description:	Input	Output	Requirements	Basic Work Flow
Generating reports	Customer's Response	Reports	Internet connectivity required	According to data present in the user form the system will generate reports

				and manager can analyze the data
--	--	--	--	----------------------------------

Analyze Module:

The data analyze module includes the following functional requirements:

ID:	FR_10			
Name:	Drill down Analyze			
Description:	Input	Output	Requirements	Basic Work Flow
Analyze the data	Select City/Select Area	Selected reports show	Internet connectivity required	Manager can select the specific region see the specific reports and even if he/she don't apply any filter then the whole country reports will show

ID:	FR_11			
Name:	Roll up Analyze			
Description:	Input	Output	Requirements	Basic Work Flow
Analyze the data	Select Area>Select City	Selected reports show	Internet connectivity required	Manager can select the specific city to see the specific reports and even if he/she don't apply any filter then the whole country reports will show

ID:	FR_12
Name:	Date Wise Analyze



Description:	Input	Output	Requirements	Basic Work Flow
Analyze the data	Select month	Selected reports show	Internet connectivity required	Manager can select the month to see the specific report

ID:	FR_13			
Name:	Date Wise Analyze			
Description:	Input	Output	Requirements	Basic Work Flow
Analyze the data	Select year	Selected reports show	Internet connectivity required	Manager can select the year to see the specific report

ID:	FR_14			
Name:	Dealer Wise Analyze			
Description:	Input	Output	Requirements	Basic Work Flow
Analyze the data	Select dealer	Selected reports show	Internet connectivity required	Manager can select the dealer to see the specific report

User Characteristics

Educational level

Customer: The customer must know the English in order to fill out the survey and know how to fill the online survey.

Dealer: The dealer must know a little knowledge of computer in order to read and send the email.

Company: The Company should have knowledge to use the software.

Admin: The admin is the person from company and he/she know how to use computer and must have database knowledge in order to perform operations.

Experience level

Dealer: The dealer should know how to send and read the emails.



Admin: Admin must have an experience in order to perform operations.

Technical expertise

Admin: The admin should have knowledge to perform crud operations.

Constraints

- Manage functions
- Reliability Requirement

Specific Requirements

The software will perform the following functional and non-functional requirements.

Functional Requirements

The functional requirements are following:

Customizable framework

We make our framework customizable so there is no limit to use this software in automobile industry. All automobile industry manufacturer it may be Honda, Toyota or others all of them use our software for the sales and services provided by the dealership.

We also use customizable framework so we can easily change the front end of the software easily without changing or building the whole software again. This benefit gives our software a big advantage to change layout of software and update it easily.

Questionnaires send on the basis of sales and services

Questionnaires are making on the basis of sales and services of the dealers it means that all questionnaires are not same for all of our customers. Manufacturer first observed the sales and services of the dealers and make questionnaires form on the basis of that sales and services. Different questionnaires are sent to different dealers on the basis of sales and services which they provide.

Check the correctness of data

The system will also check the correctness of the customer's data. The system will not accept the customer's data if there is any incorrect information filled by the customer in the form. So if the user input any wrong information in the form, an error message will be generated and the system will not accept the customer's form until the customer corrects the form. The system will check the customer's response by checking their ID to verify the valid customer. If there is any duplication data then the system put it in the log error.

Questionnaire update

We also update the questionnaires on every season so if there is ambiguity in previous form and if manufacturer make new product then the questionnaire form will be updated and new questionnaire form will be sent to the customers.

Send the questionnaire form to the customer by email

After making the questionnaire form it will be sent to the customers directly by email.

Fill the questionnaire form of the customer by call

If any of the customer will not fill this form then manufacturer also contact to this customer by phone number to fill the form.

Customer Feedback Analysis

This is the main goal of project when manufacturer get the feedback from the customers then the system will generate reports and the manager will analyze the data. That reports will be generate on the basis of the customer's feedback.

Overall Feedback Analysis of Customer's

After analyze the data for every single customer then it will be merged with all customers of same types and then analyses the overall feedback of the customers which will be taken from questionnaire form. Software will show the performance and issues related to dealer and products which is our main goal to achieve.

System will give the rating to dealers

When all the data is analyses by the software then it will give the rating to the dealers according to the feedback which will give customers to the manufacturer. The rating is given in the form of a report

Non-Functional Requirements

- Response Time
- Data Integrity

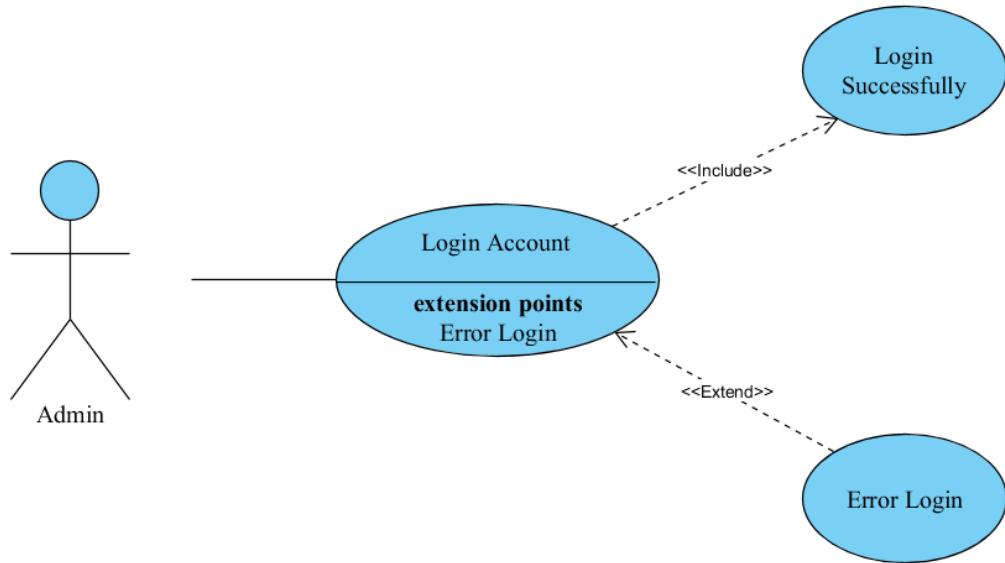


Chapter 3: Use Case Analysis



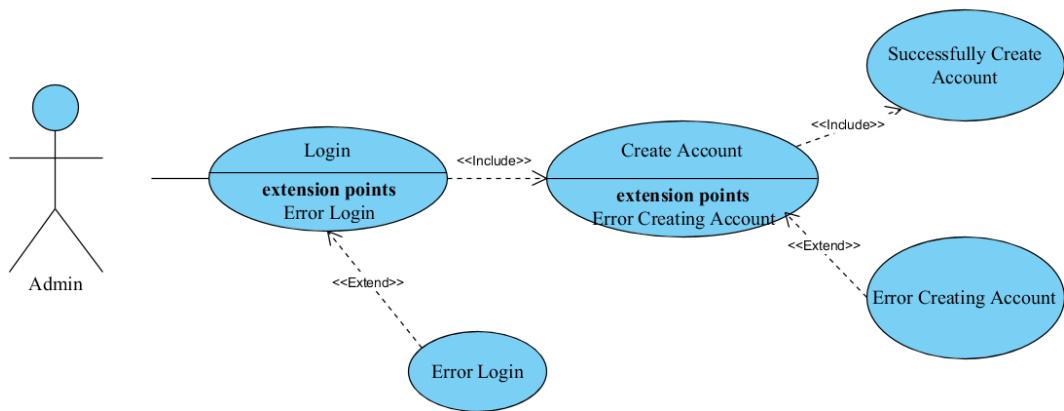
Use Cases for Admin Module

Use case diagram for login admin account



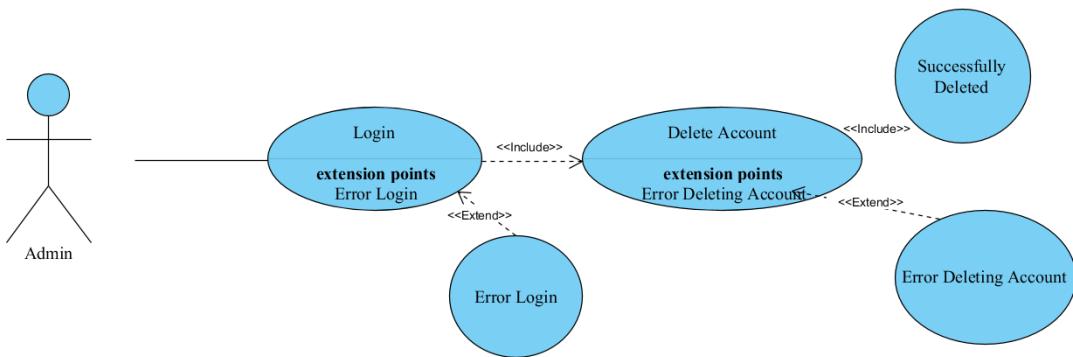
Use Case ID	UC_01	
Use Case Name	Login Admin Account	
Description	Enter the admin login details	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Email Password	
Post-Condition	Admin account logged in	
Basic Flow	Actor Action	System Action
	Enter the details	Login Account
Alternate Flow		

Use case diagram for create account



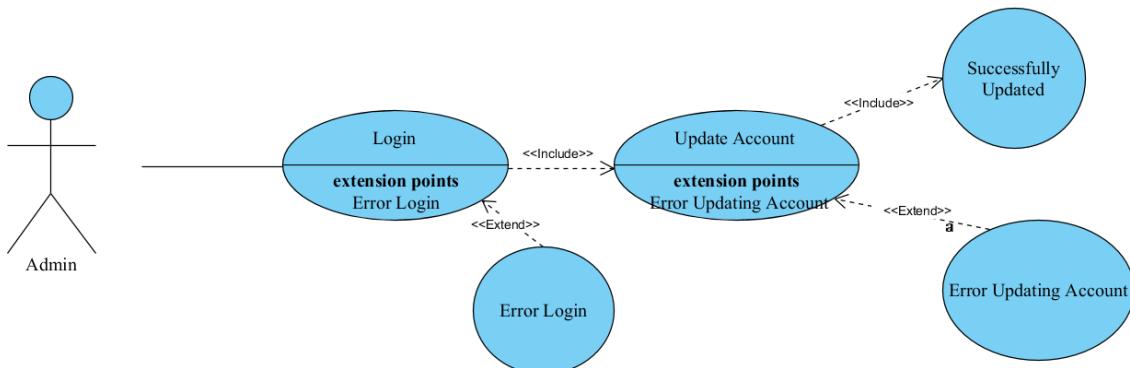
Use Case ID	UC_02	
Use Case Name	Create Account	
Description	Enter the details to create an account	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	First Name Last Name Email CNIC Phone# Area City Username Password	
Post-Condition	Account created	
Basic Flow	Actor Action	System Action
	Enter the details	
Alternate Flow		

Use case diagram for delete account



Use Case ID	UC_03	
Use Case Name	Delete Account	
Description	Login into account to delete it	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Email (Admin) Name (Admin)	
Post-Condition	Account deleted	
Basic Flow	Actor Action	System Action
	Click on Delete Button	delete it
Alternate Flow		

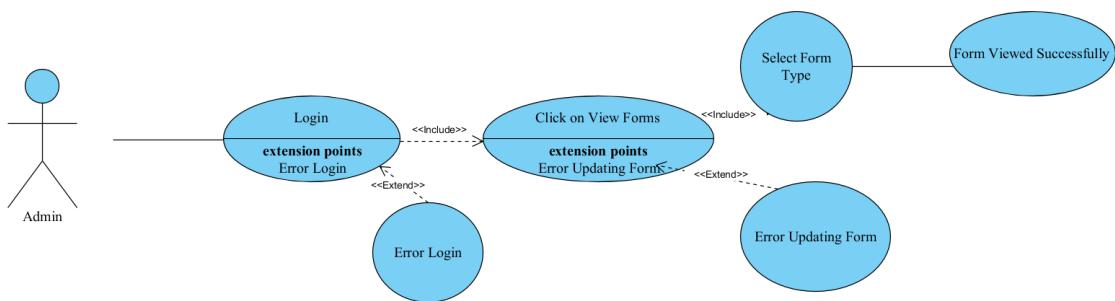
Use case diagram for update account



Use Case ID	UC_04	
Use Case Name	Update Account	
Description	Login into account to update it	

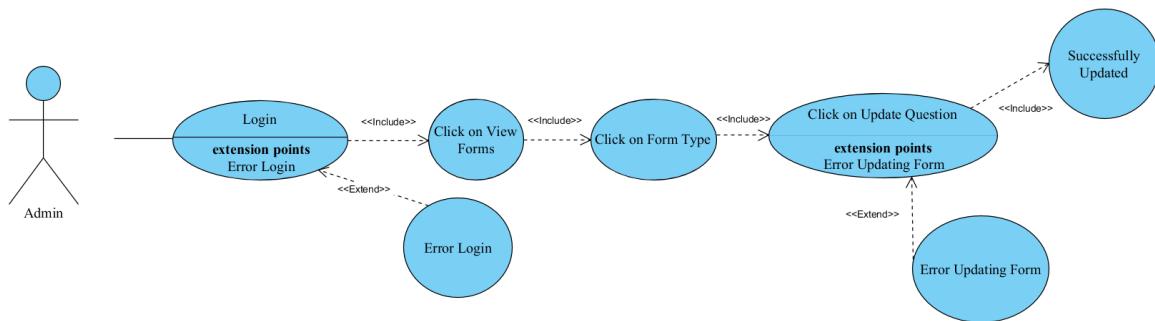
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	First Name Last Name Email CNIC Phone# Area City Username Password	
Post-Condition	Account updated	
Basic Flow	Actor Action	System Action
	Enter the details	update it
Alternate Flow		

Use case diagram for view form



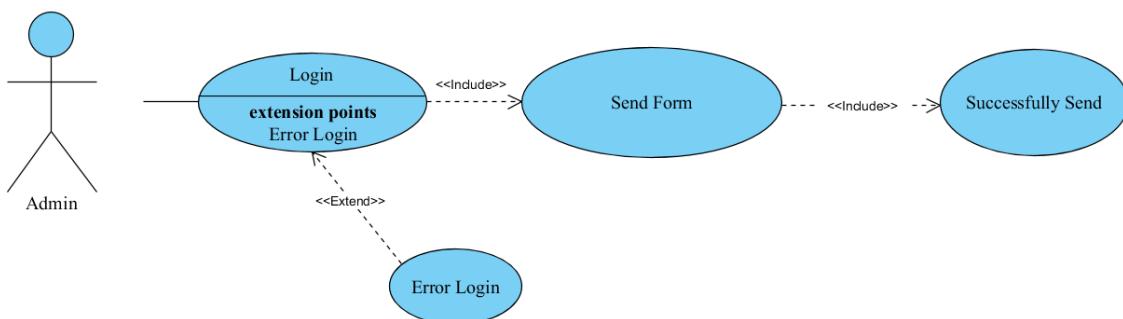
Use Case ID	UC_05	
Use Case Name	View Form	
Description	View form according to form type	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Click on view form button	
Post-Condition	Form viewed	
Basic Flow	Actor Action	System Action
	Form View	Display form page
Alternate Flow		

Use case diagram for update form



Use Case ID	UC_06	
Use Case Name	Update Form	
Description	Update Form according to new information	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Questions, Choices	
Post-Condition	Form updated	
Basic Flow	Actor Action	System Action
	Enter and edit new questions	Form updated
Alternate Flow		

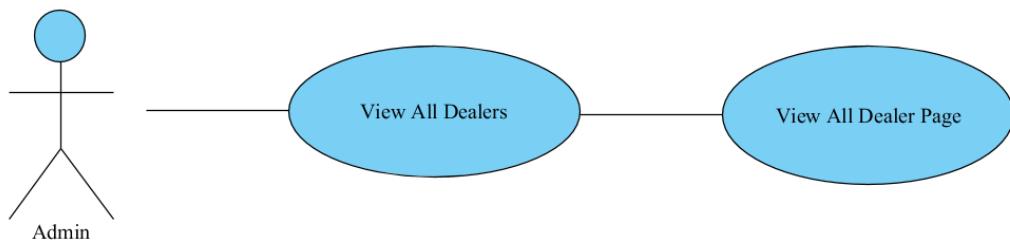
Use case diagram for send form



Use Case ID	UC_07	
Use Case Name	Send Form	
Description	Sending form to customer	
Primary Actor	Admin	

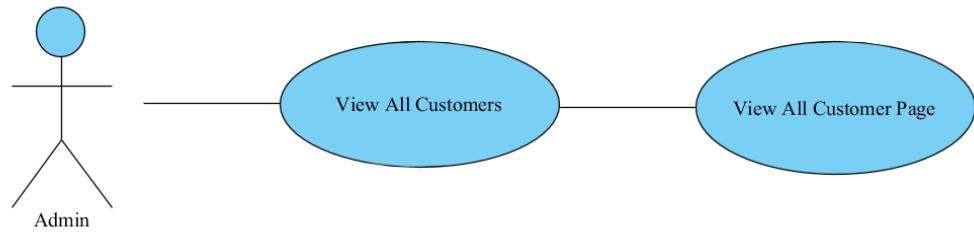
Secondary Actor		
Pre-Condition	Successfully login, Have Form	
Post-Condition	Form is sent to user	
Basic Flow	Actor Action	System Action
	Click on send button	Form is sent to user
Alternate Flow		

Use case diagram for view all dealers



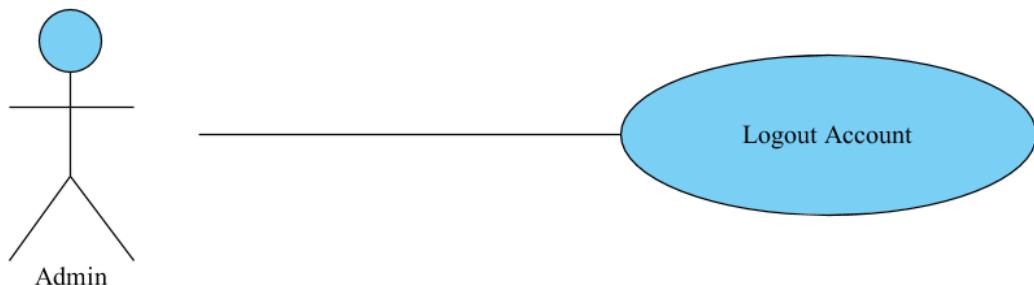
Use Case ID	UC_08	
Use Case Name	View All Dealer	
Description	View all dealer page	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Successfully login, In Dashboard Page	
Post-Condition	View dealer page	
Basic Flow	Actor Action	System Action
	Click on view all dealers button	Display view all dealer page
Alternate Flow		

Use case diagram for view all customers



Use Case ID	UC_09	
Use Case Name	View All Customer	
Description	View all customer page	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Successfully login, In Dashboard Page	
Post-Condition	View customer page	
Basic Flow	Actor Action	System Action
	Click on view all customers button	Display view all customer page
Alternate Flow		

Use case diagram for logout admin account



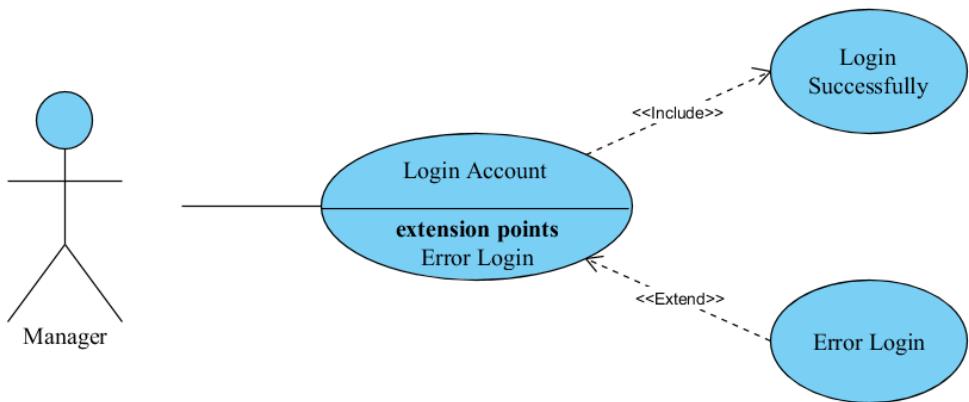
Use Case ID	UC_10
Use Case Name	Logout Account



Description	Logout Account	
Primary Actor	Admin	
Secondary Actor		
Pre-Condition	Logged in previously	
Post-Condition	Admin account logged out	
Basic Flow	Actor Action	System Action
	Click on Logout button	Account logged out
Alternate Flow		

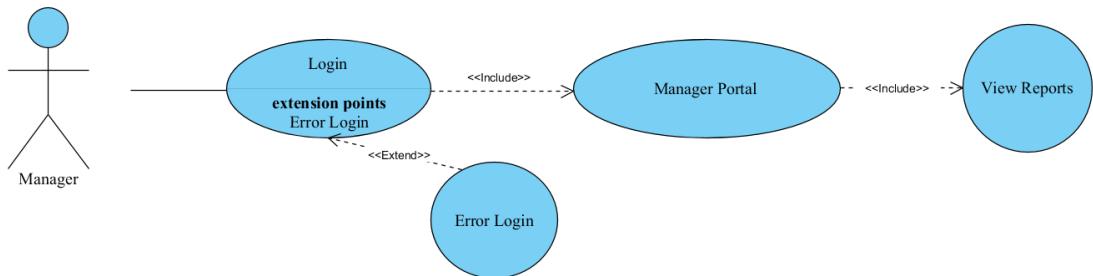
Use Cases for Manager Module

Use case diagram for login manager account



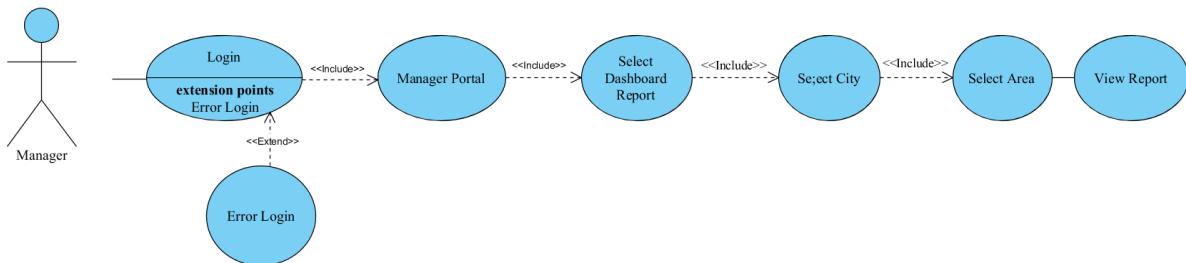
Use Case ID	UC_11	
Use Case Name	Login Manager Account	
Description	Enter the manager login details	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Email Password	
Post-Condition	Manager account logged in	
Basic Flow	Actor Action	System Action
	Enter the details	Login Account
Alternate Flow		

Use case diagram for view reports



Use Case ID	UC_12	
Use Case Name	View Report	
Description	Select report and view	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Login and select report	
Post-Condition	Display Report	
Basic Flow	Actor Action	System Action
	Select report and Click on view report	Display report
Alternate Flow		

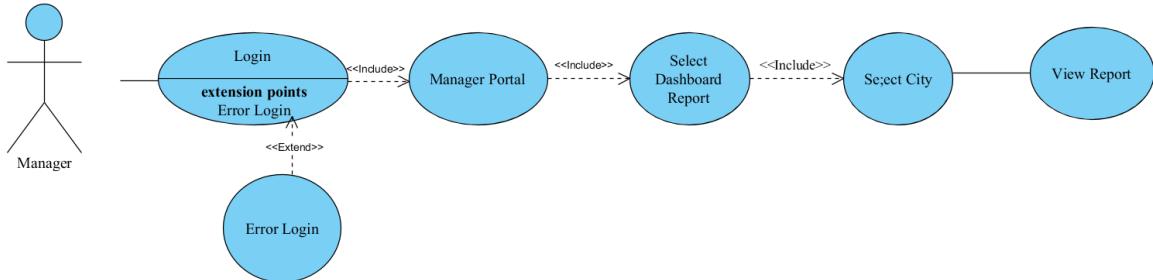
Use case diagram for area wise view reports



Use Case ID	UC_13	
Use Case Name	Area wise analyze	
Description	Analyze report by region wise	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Select report	
Post-Condition	Report is displayed	
Basic Flow	Actor Action	System Action

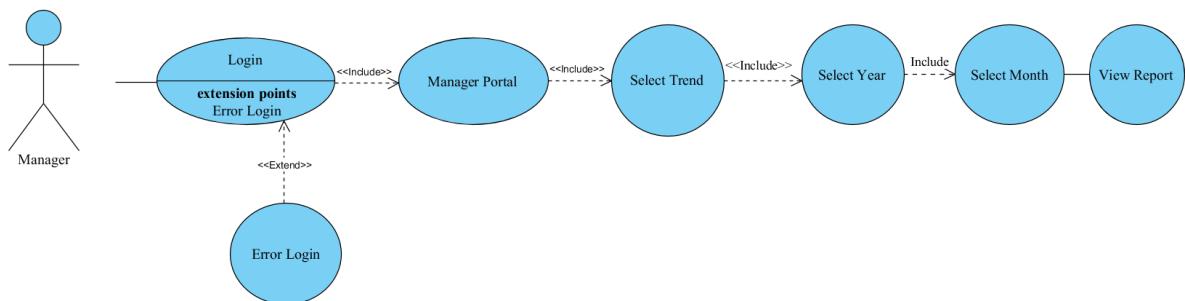
	Click on select report button	Report is displayed
Alternate Flow		

Use case diagram for city wise view reports



Use Case ID	UC_14	
Use Case Name	City wise analyze	
Description	Analyze report by city wise	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Select report	
Post-Condition	Report is displayed	
Basic Flow	Actor Action	System Action
	Click on select report button	Report is displayed
Alternate Flow		

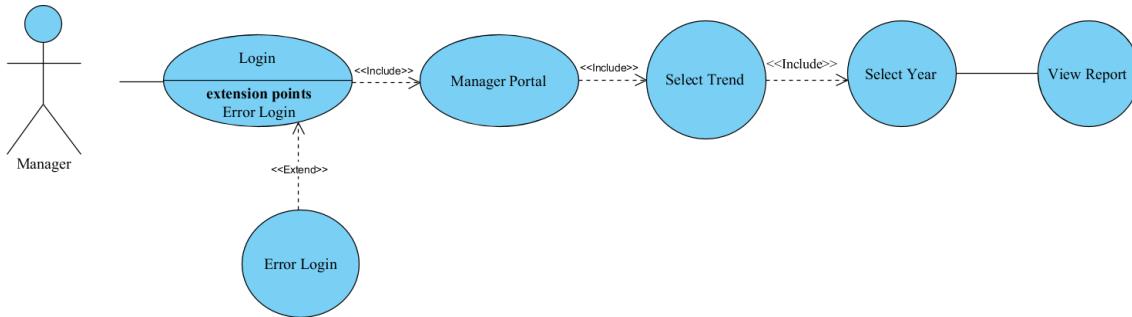
Use case diagram for month wise view reports



Use Case ID	UC_15	
Use Case Name	Month wise analyze	
Description	Analyze report by month wise	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Select report	

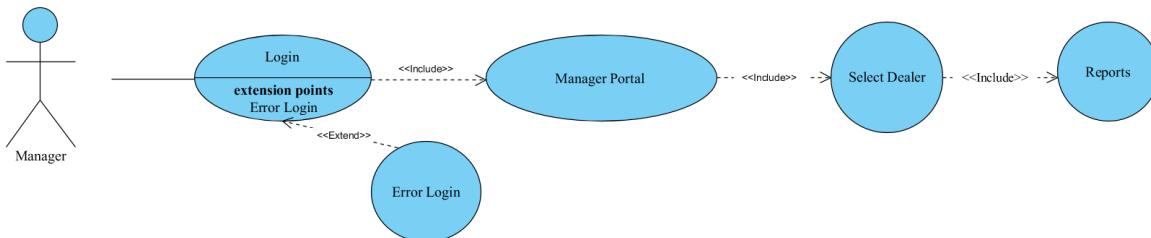
Post-Condition	Report is displayed	
Basic Flow	Actor Action	System Action
	Click on select report button	Report is displayed
Alternate Flow		

Use case diagram for year wise view reports



Use Case ID	UC_16	
Use Case Name	Year wise analyze	
Description	Analyze report by Year wise	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Select report	
Post-Condition	Report is displayed	
Basic Flow	Actor Action	System Action
	Click on select report button	Report is displayed
Alternate Flow		

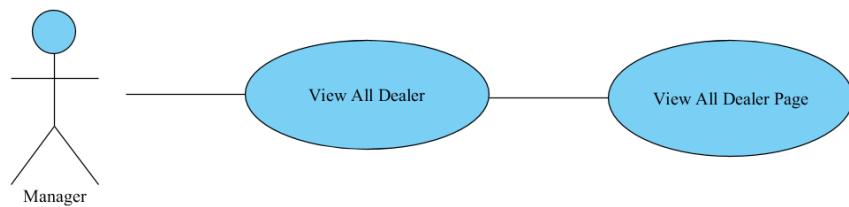
Use case diagram for dealer wise view reports



Use Case ID	UC_17	
Use Case Name	Dealer wise analyze	

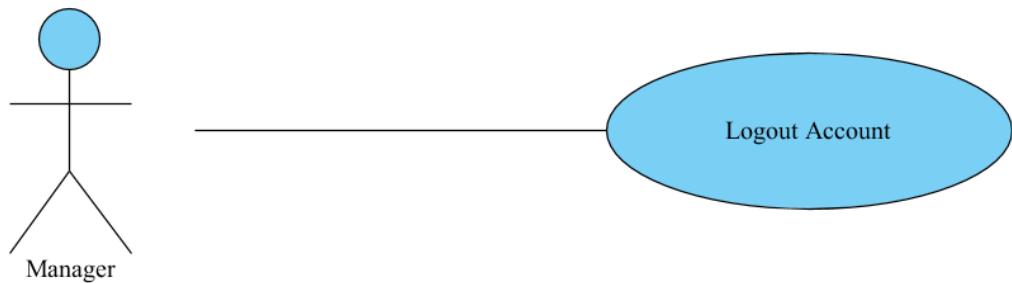
Description	Analyze report by dealer wise	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Select report	
Post-Condition	Report is displayed	
Basic Flow	Actor Action	System Action
	Click on select report button	Report is displayed
Alternate Flow		

Use case diagram for manager view all dealer page



Use Case ID	UC_18	
Use Case Name	View All Dealer Page	
Description	View all dealer to view its ranking report	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	View all dealer	
Post-Condition	Page is displayed	
Basic Flow	Actor Action	System Action
	Click on view all dealer button	Page is displayed
Alternate Flow		

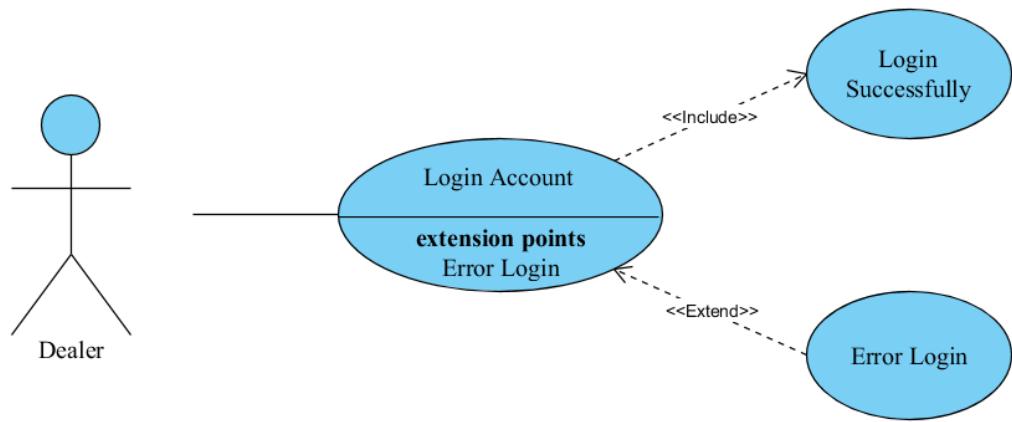
Use case diagram for manager logout account



Use Case ID	UC_19	
Use Case Name	Logout Account	
Description	Logout Account	
Primary Actor	Manager	
Secondary Actor		
Pre-Condition	Logged in previously	
Post-Condition	Manager account logged out	
Basic Flow	Actor Action	System Action
	Click on Logout button	Account logged out
Alternate Flow		

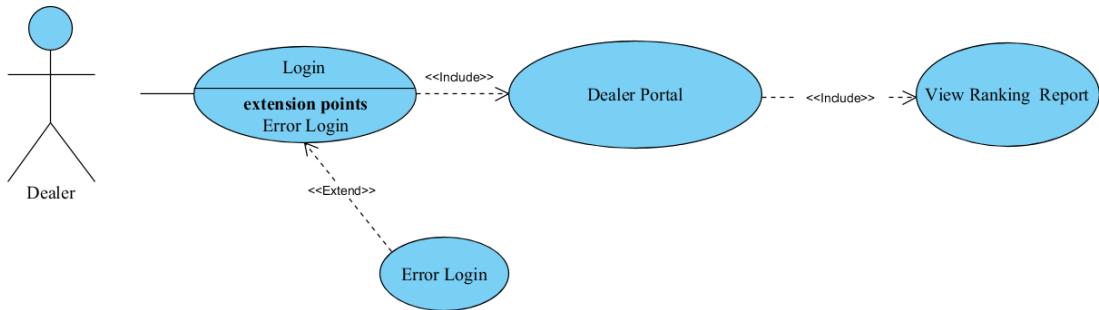
Use Cases for Dealer Module

Use case diagram for login dealer account



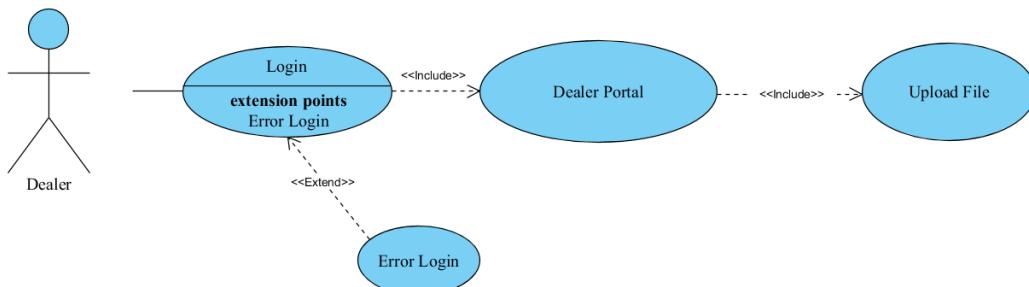
Use Case ID	UC_20	
Use Case Name	Login Dealer Account	
Description	Enter the dealer login details	
Primary Actor	Dealer	
Secondary Actor		
Pre-Condition	Email Password	
Post-Condition	Dealer account logged in	
Basic Flow	Actor Action	System Action
	Enter the details	Login Account
Alternate Flow		

Use case diagram for dealer view report



Use Case ID	UC_21	
Use Case Name	Dealer View Report	
Description	View Ranking report	
Primary Actor	Dealer	
Secondary Actor		
Pre-Condition	Successfully login, Click display report	
Post-Condition	Report is displayed	
Basic Flow	Actor Action	System Action
	Click on view report button	Display report
Alternate Flow		

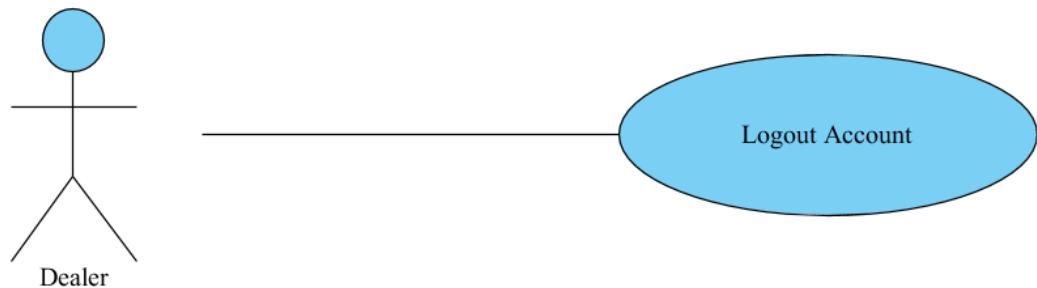
Use case diagram for upload file



Use Case ID	UC_22	
Use Case Name	Upload File	
Description	Upload File of customer data	
Primary Actor	Dealer	
Secondary Actor		

Pre-Condition	Successfully login	
Post-Condition	File is uploader	
Basic Flow	Actor Action	System Action
	Click on upload button	File is uploaded
Alternate Flow		

Use case diagram for dealer logout account

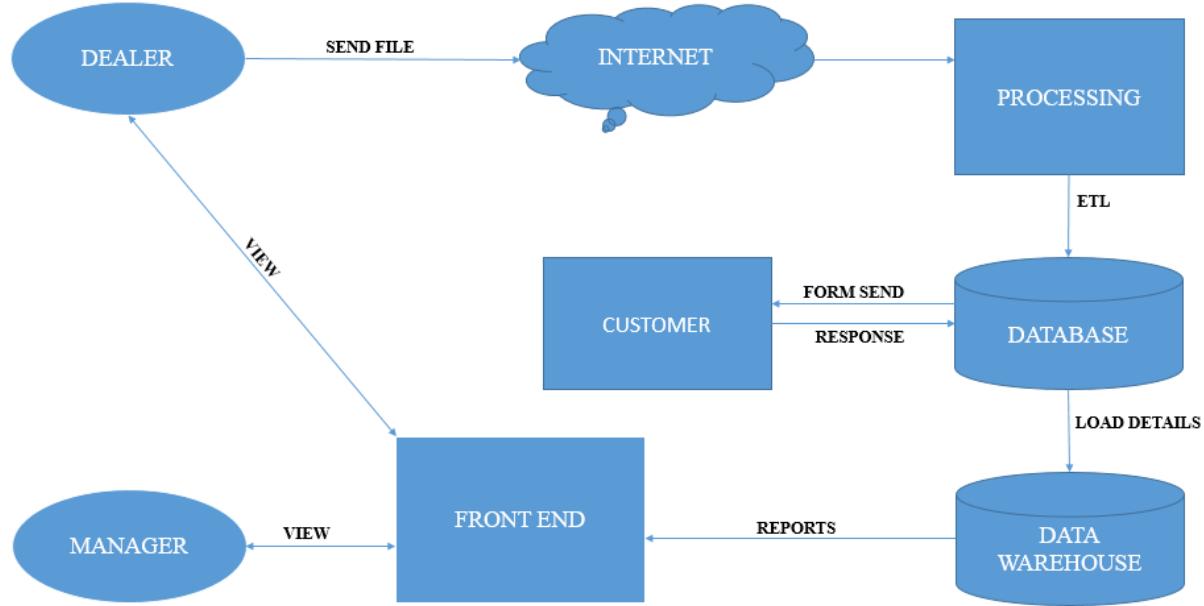


Use Case ID	UC_23	
Use Case Name	Logout Account	
Description	Logout Account	
Primary Actor	Dealer	
Secondary Actor		
Pre-Condition	Logged in previously	
Post-Condition	Dealer account logged out	
Basic Flow	Actor Action	System Action
	Click on Logout button	Account logged out
Alternate Flow		

Chapter 4: Design



Architecture Diagram



Dimensional Model

Dimensions

Customer	Dealer	Sale Response	Service Response
<u>Id</u>	<u>Id</u>	<u>Id</u>	<u>Id</u>
Dealer_Id	First_Name	Customer_Id	Customer_Id
Dealer_Name	Last_Name	Question	Answer1
Name	Phone	answer	Answer2
Phone	CNIC		Answer3
City	City		Answer4
Address	Area		Answer5
Email	Username		Answer6
Type	Email		Answer7
Arriving_Date	Password		Answer8
Arriving_Day			Answer9
Arriving_Month			Answer10
Arriving_Year			
Flag			

Dimension Table

Customer

<u>Id</u>
Dealer_Id
Dealer_Name
Name
Phone
City
Address
Email
Type
Arriving_Date
Arriving_Day
Arriving_Month
Arriving_Year
Flag

Dealer

<u>Id</u>
First_Name
Last_Name
Phone
CNIC
City
Area
Username
Email
Password

Sale Response

<u>Id</u>
Customer_Id
Question
answer

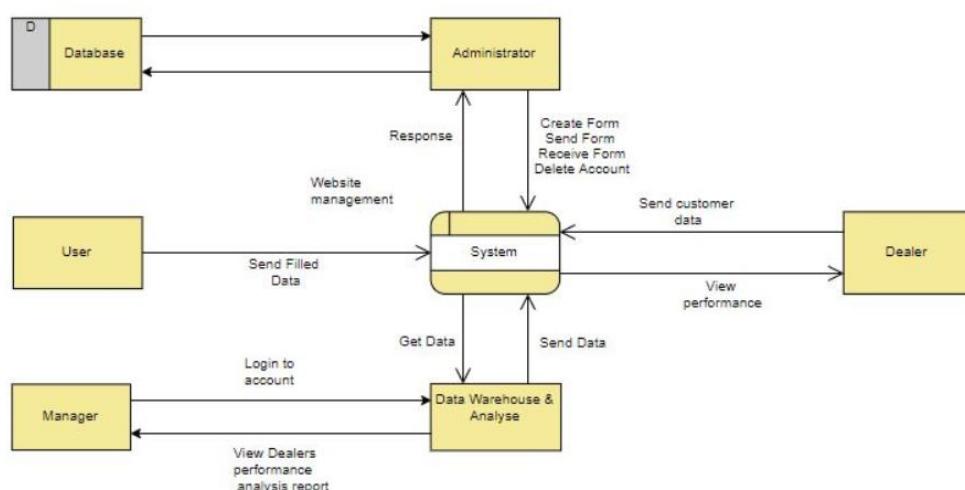


Service Response

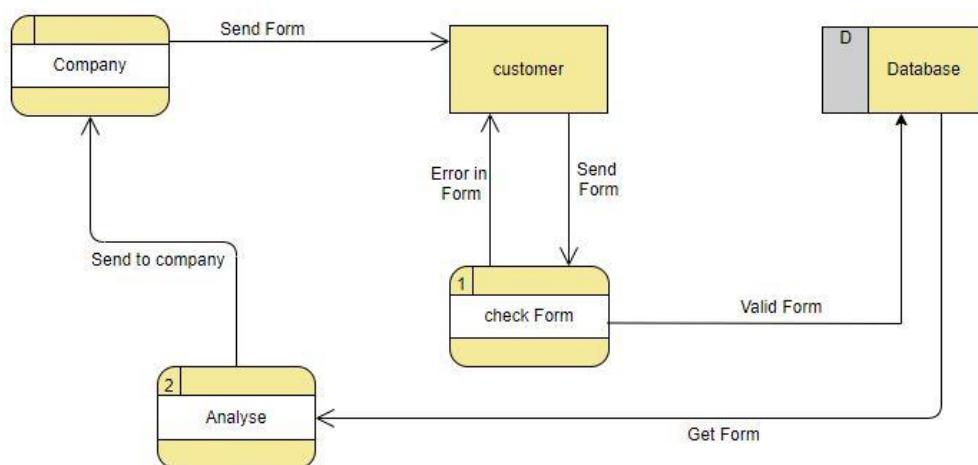
<u>Id</u>
Customer_Id
Answer1
Answer2
Answer3
Answer4
Answer5
Answer6
Answer7
Answer8
Answer9
Answer10

Data Flow Diagram

The Level 0



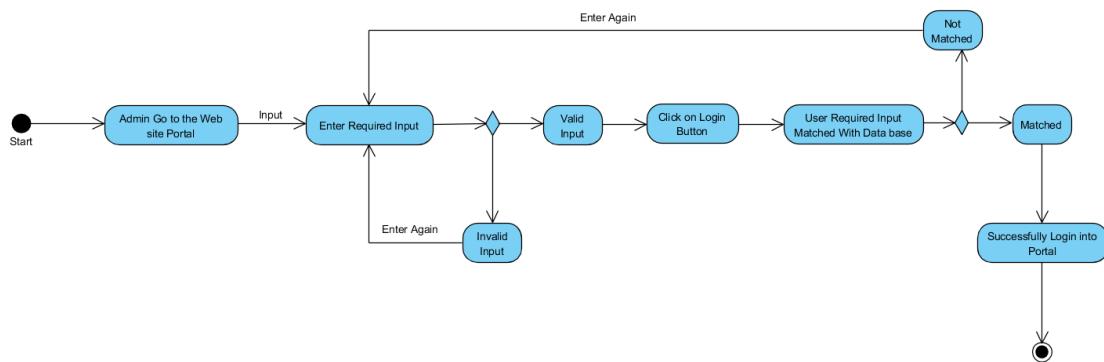
The Level 1



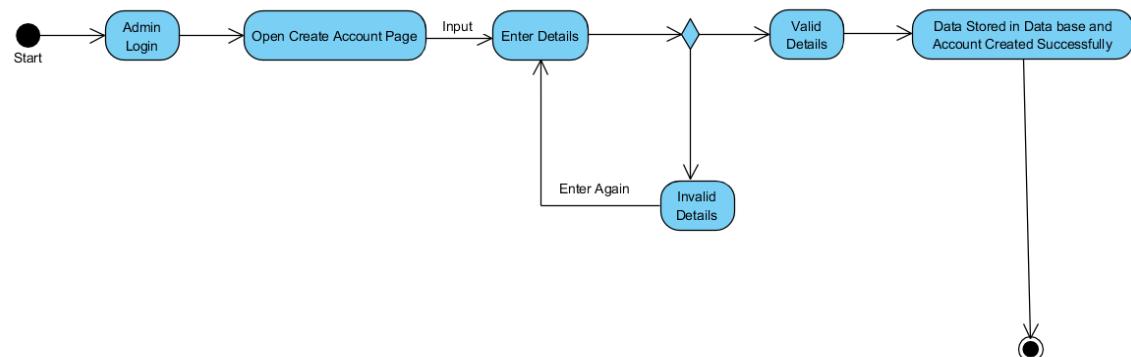
Activity Diagram

Activity for Admin

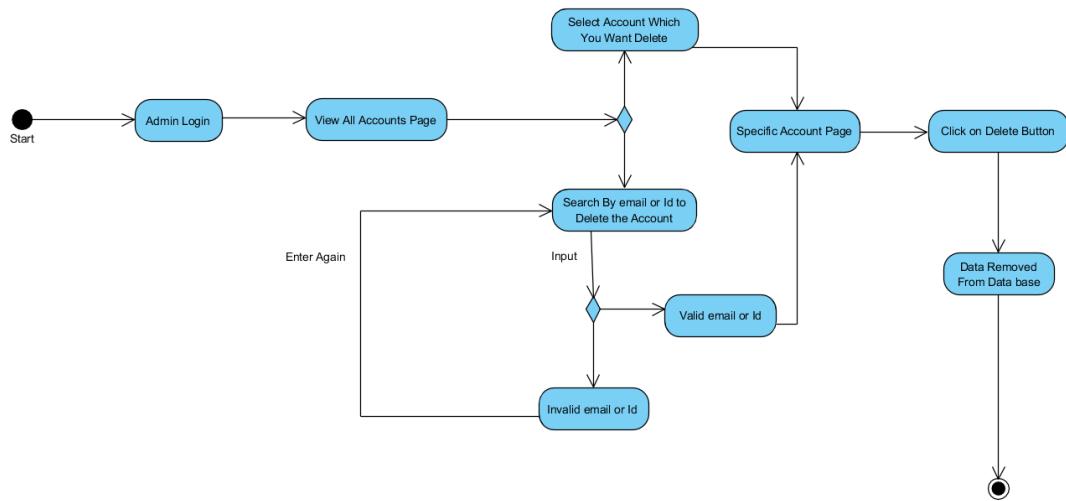
Admin Login Account:



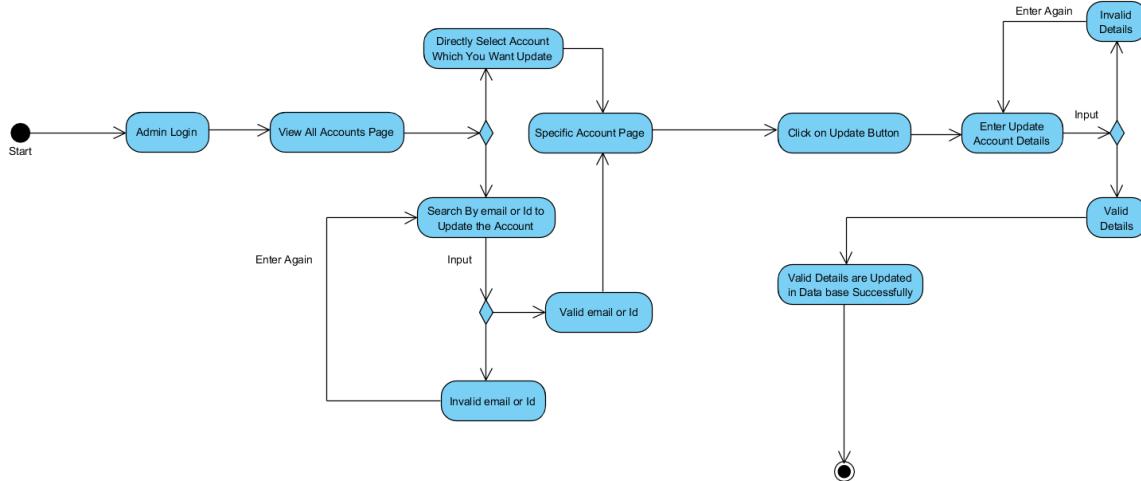
Create Account:



Delete Account:



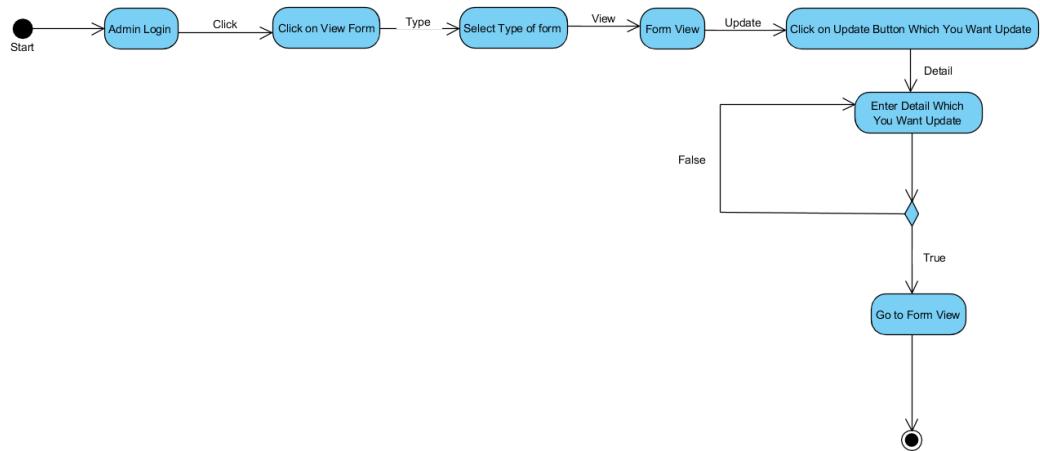
Update Account:



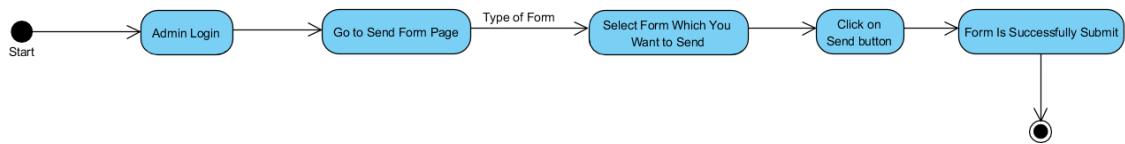
View Form:



Update Form



Send Form:



View All Dealers:



View All Customers:

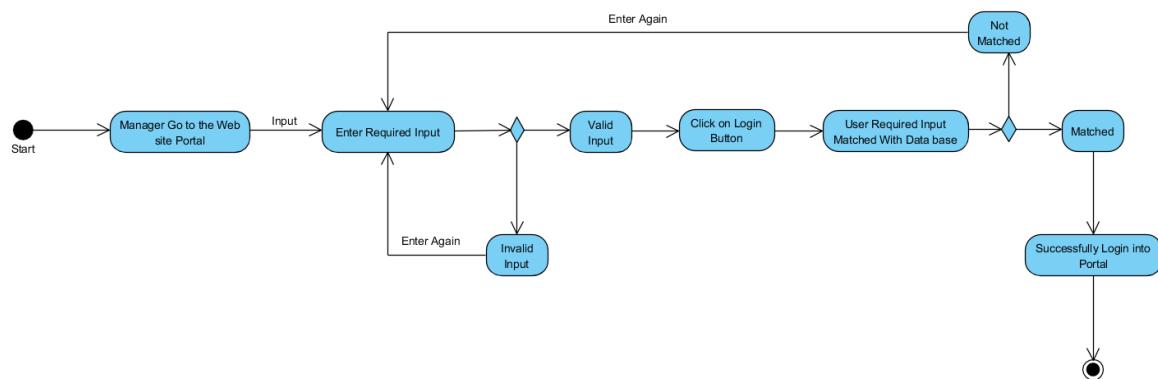


Admin Logout Account:

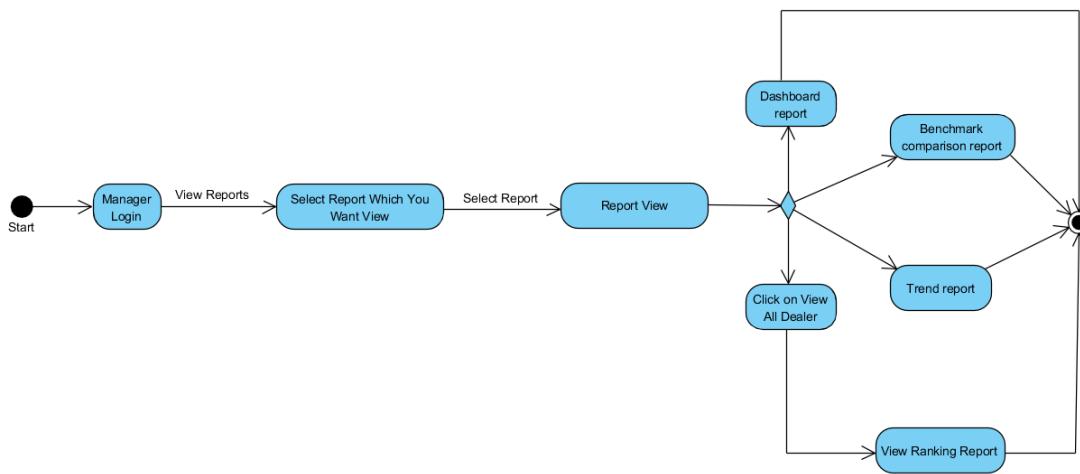


Activity for Manager

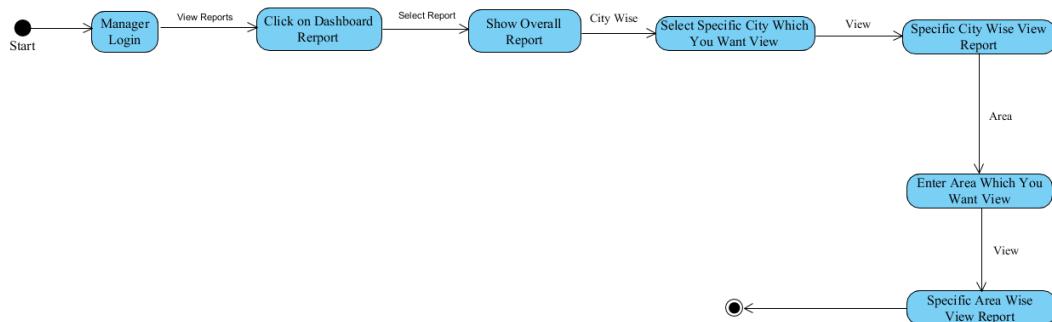
Manager Login Account:



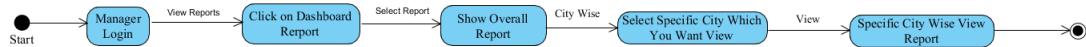
View Reports:



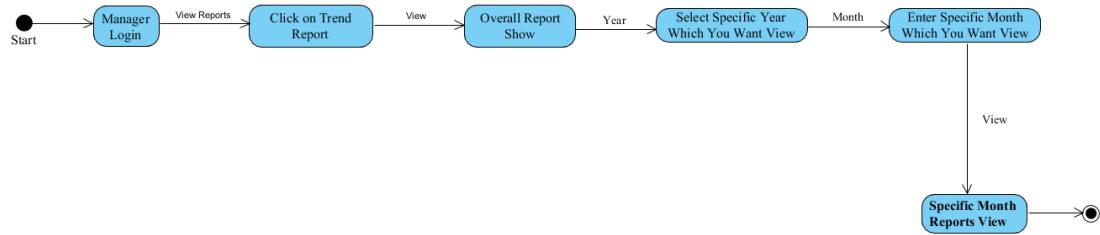
Area Wise Reports View:



City Wise Reports View:



Month Wise Reports View:



Year Wise Reports View:



Dealer Wise Reports View:



View All Dealers:

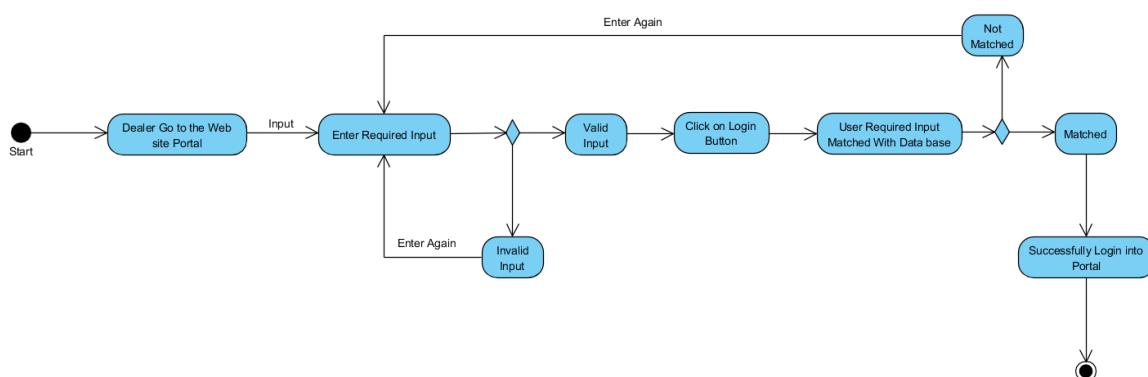


Manager Logout Account:



Activity for Dealer

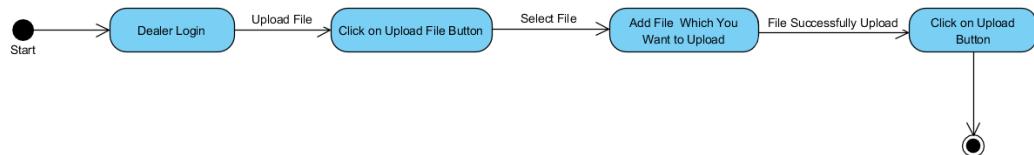
Dealer Login Account:



Dealer View Reports:



Upload File:



Dealer Logout Account:

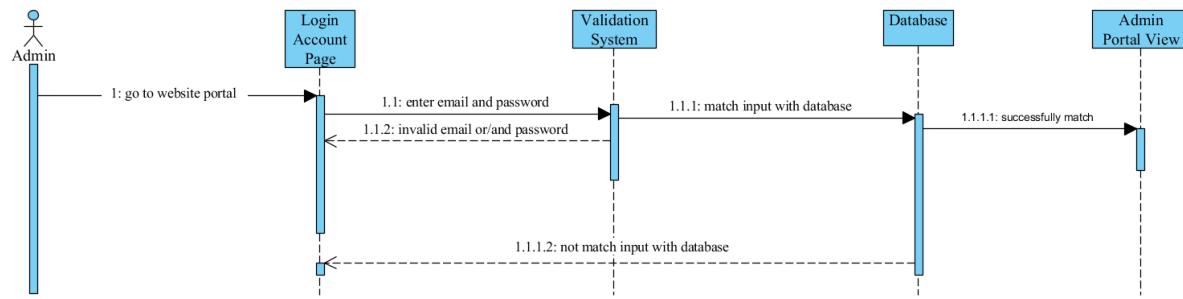


Sequence Diagram

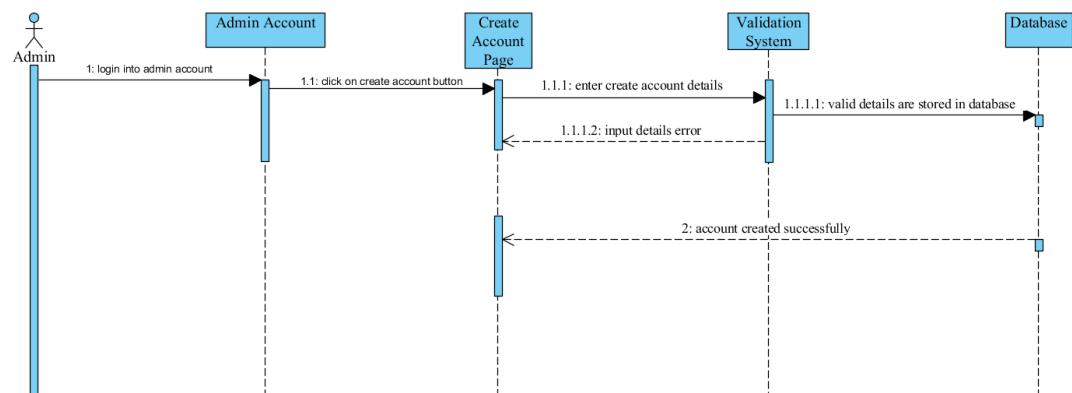
Sequence for Admin



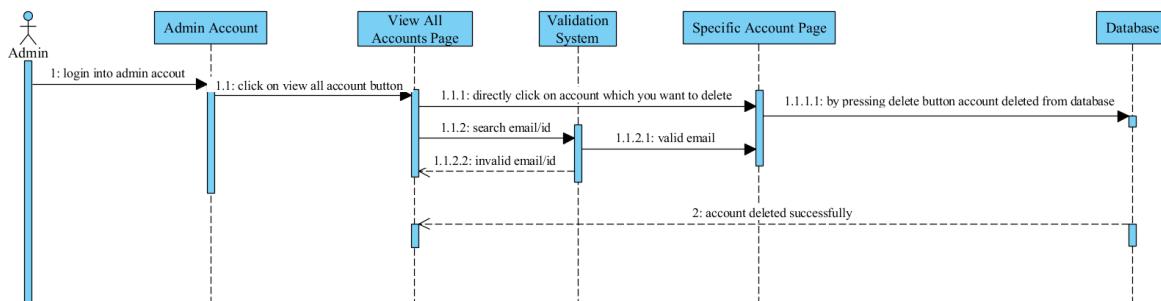
Login Admin Account:



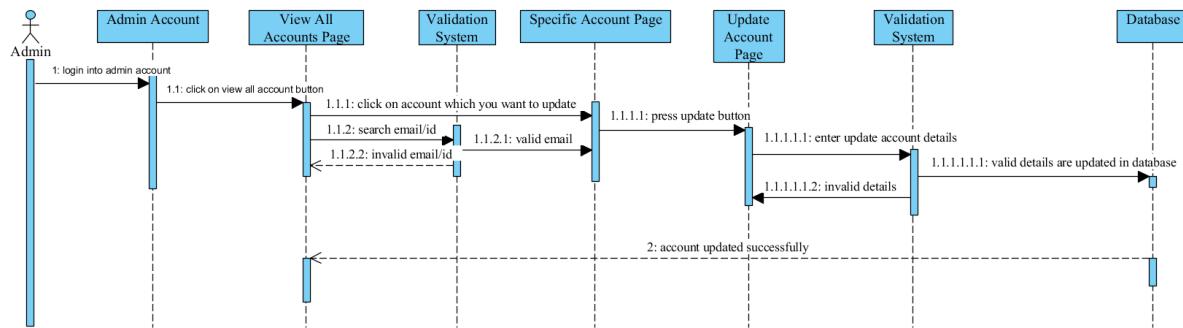
Create Account:



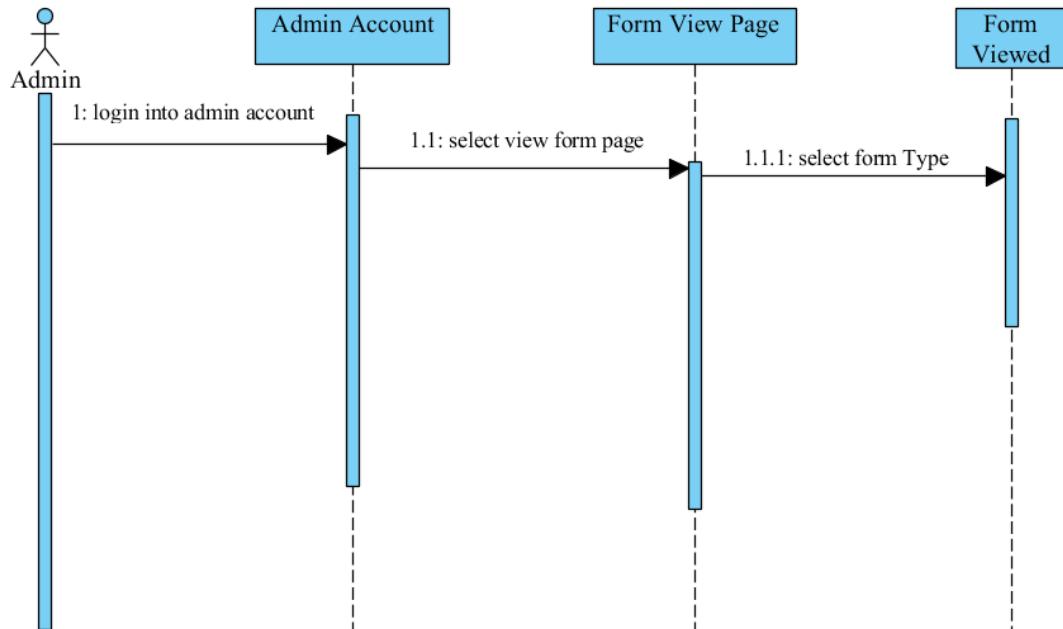
Delete Account:



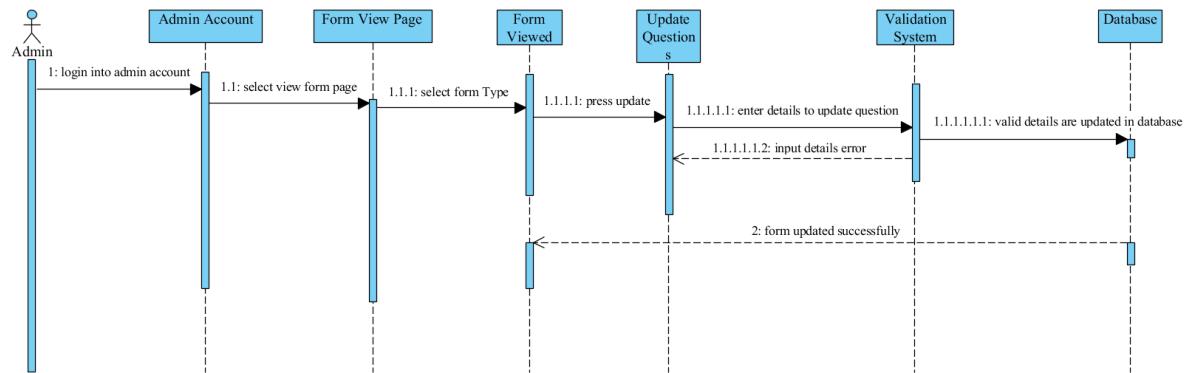
Update Account:



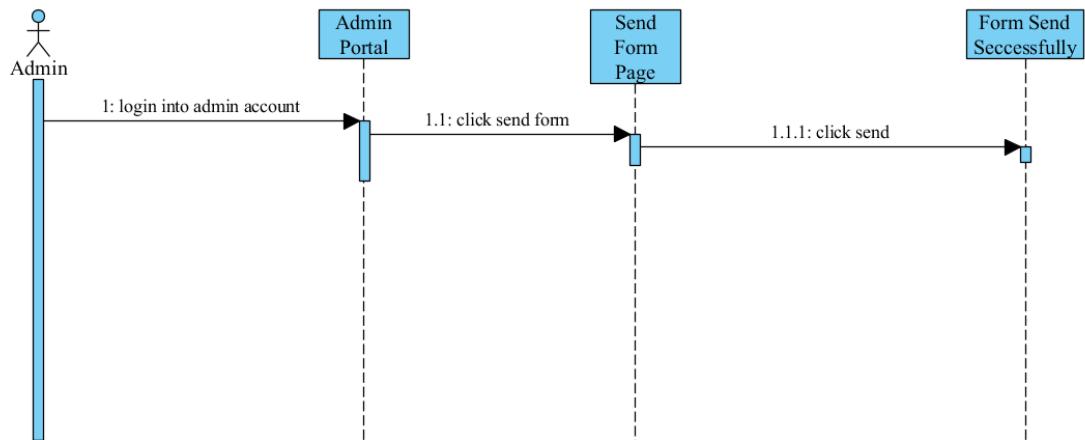
View Form:

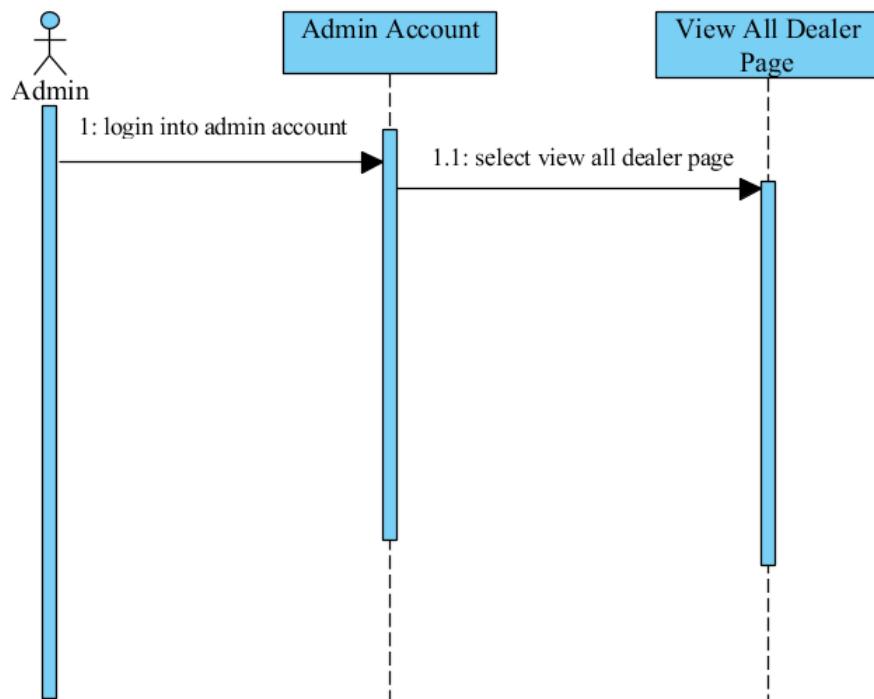


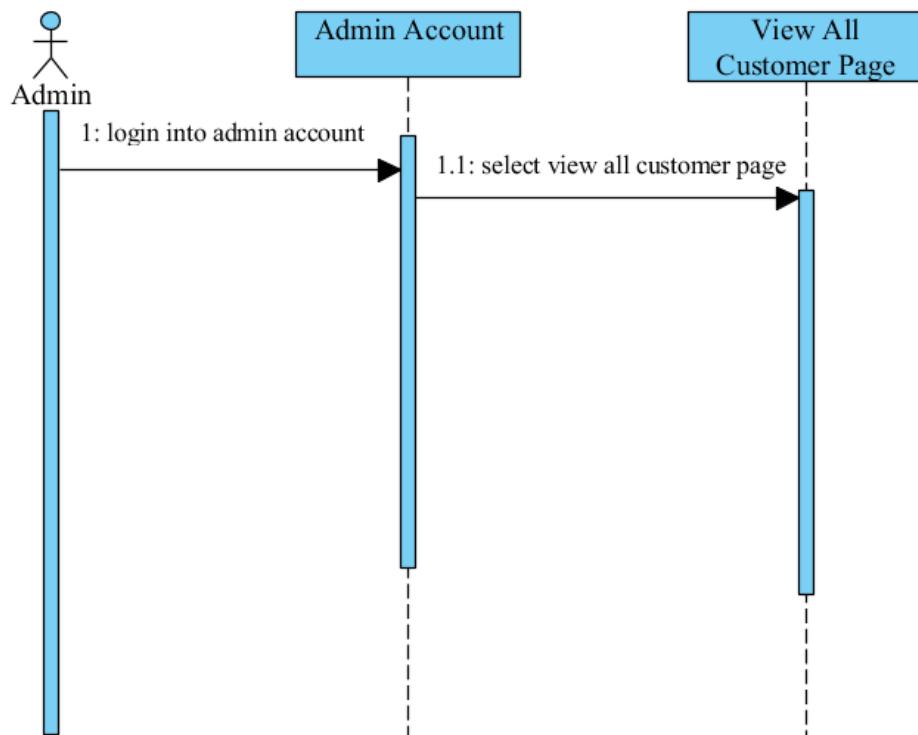
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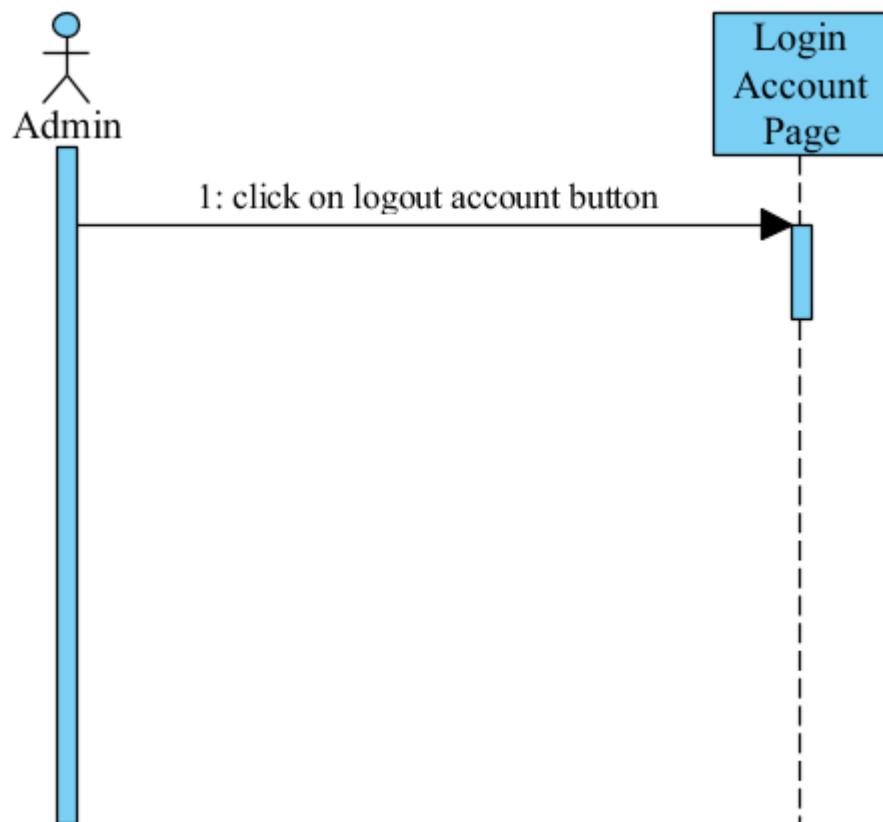
Send Form:



View All Dealers:

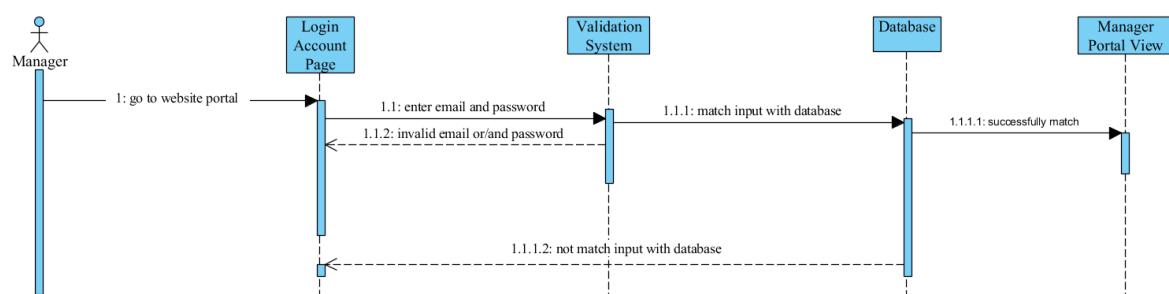
View All Customers:

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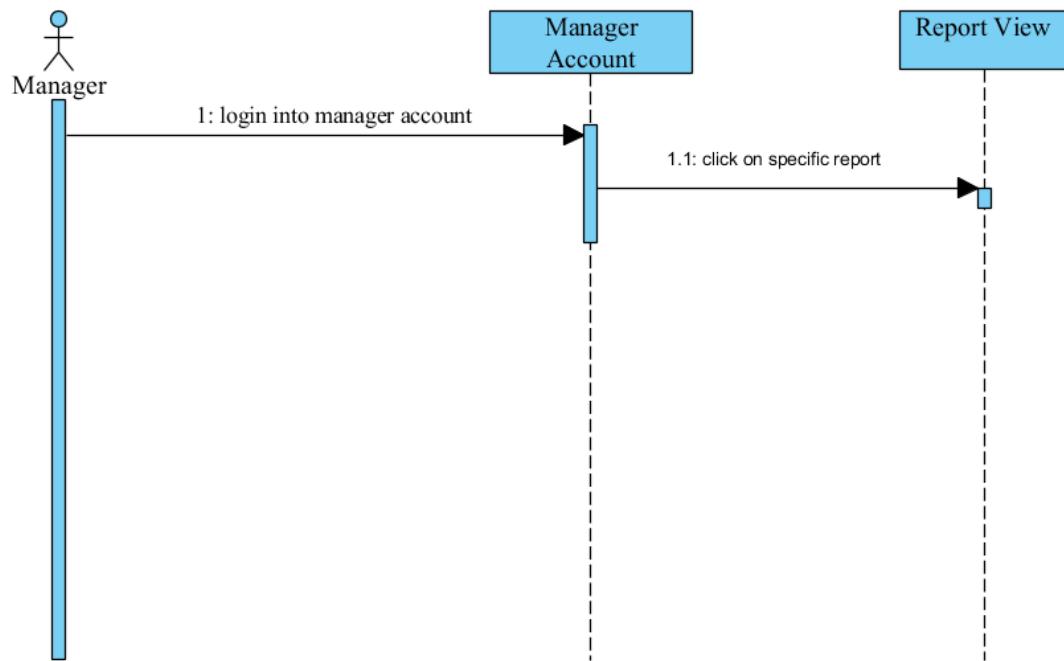


Sequence for Manager

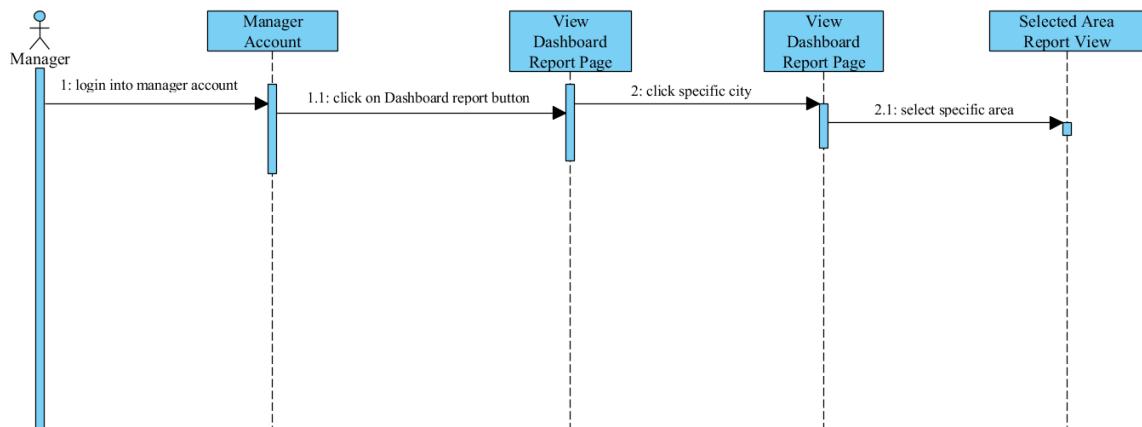
Login Manager Account:



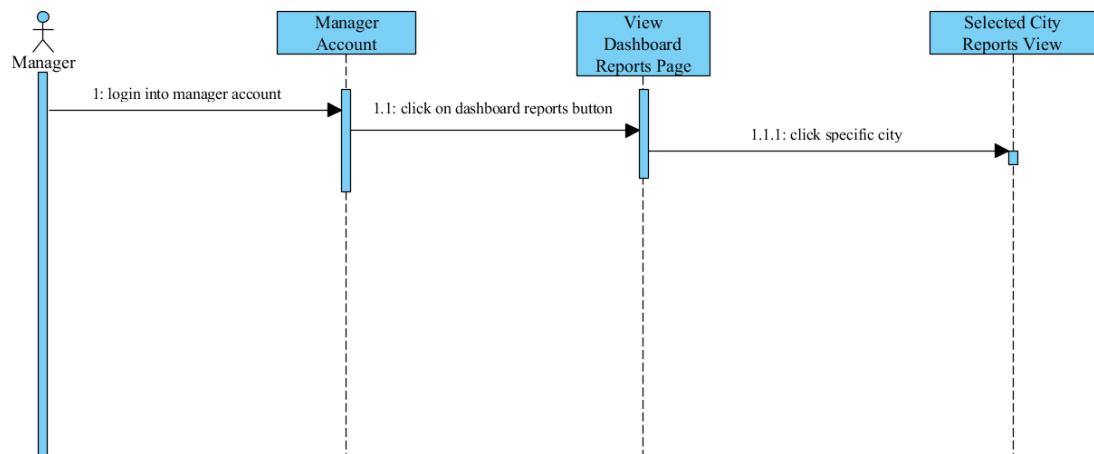
View Reports:



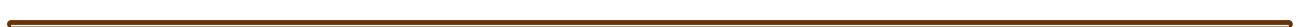
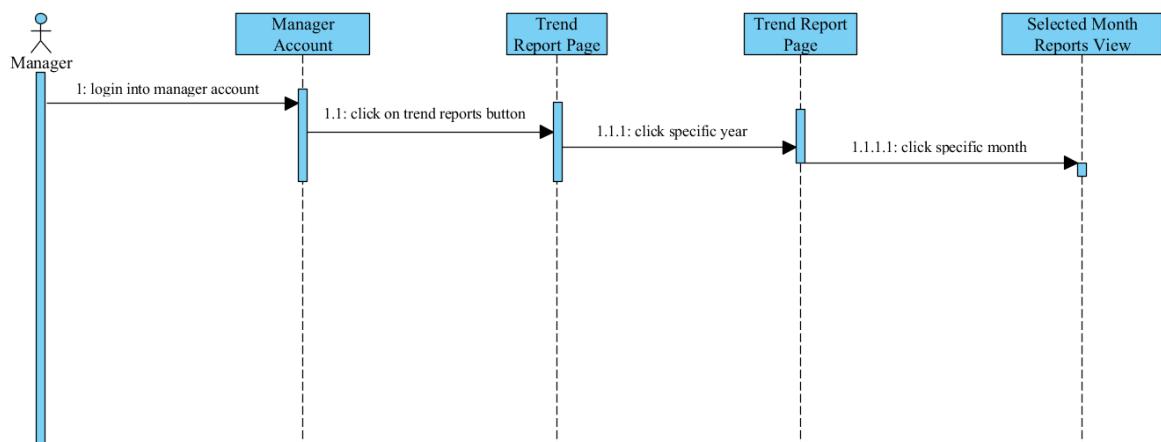
View Area Reports:



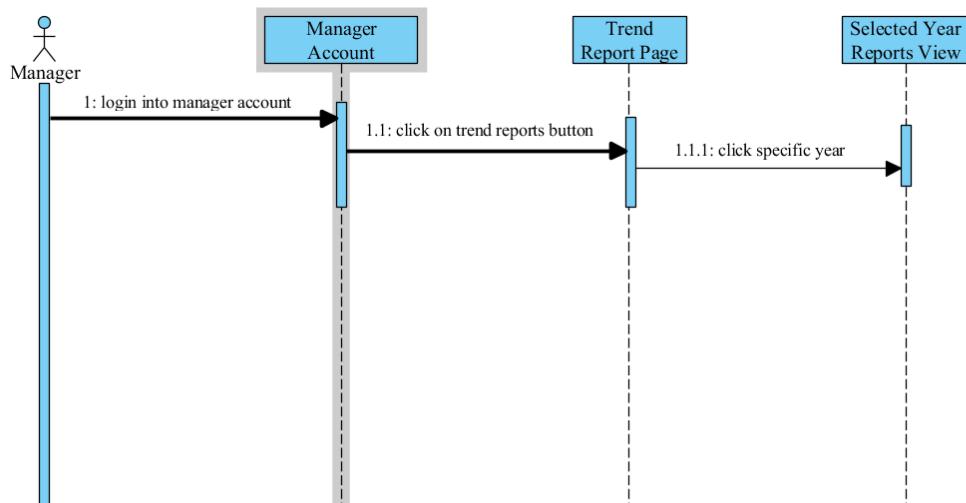
View City Reports:



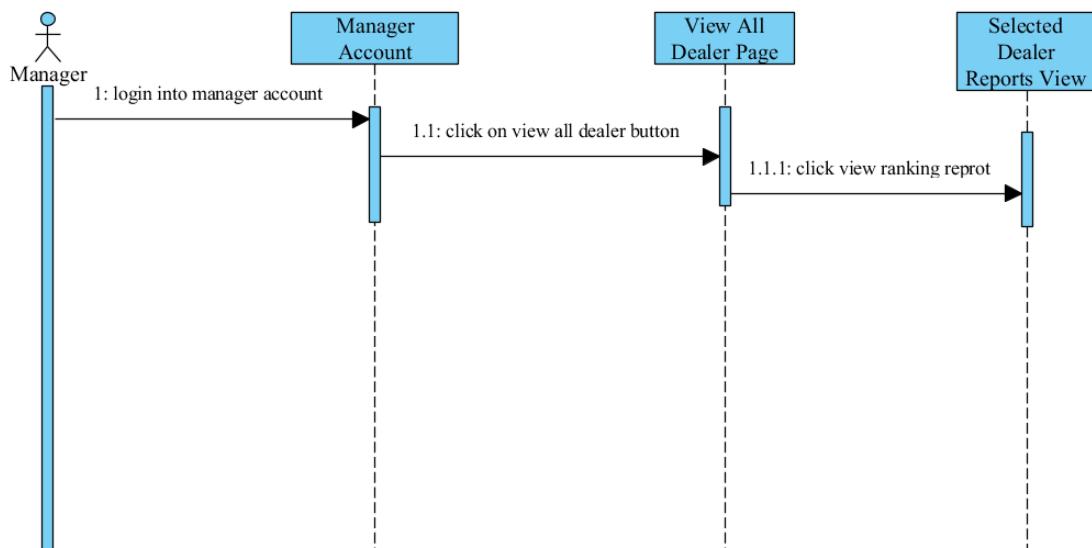
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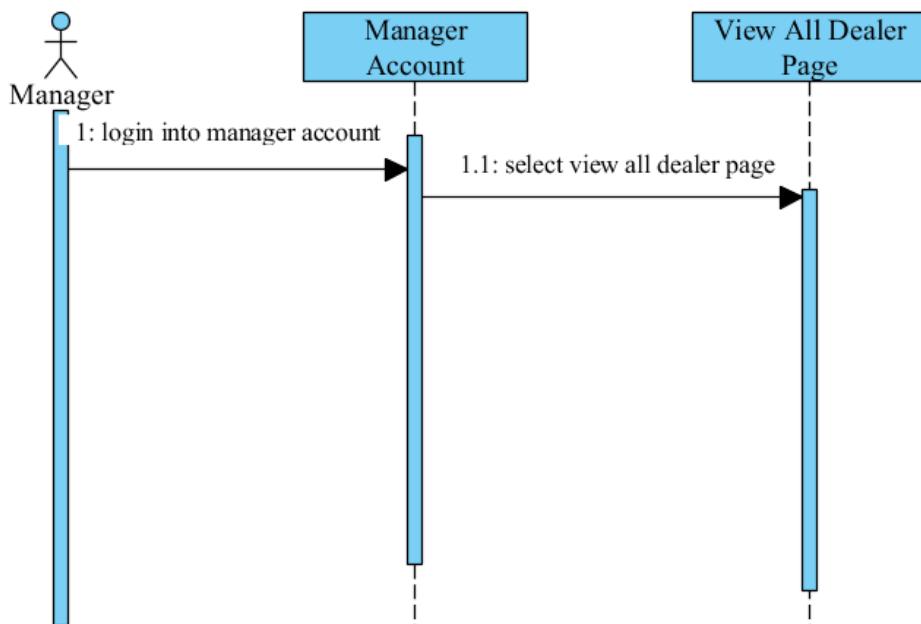


View Specific Year Reports:

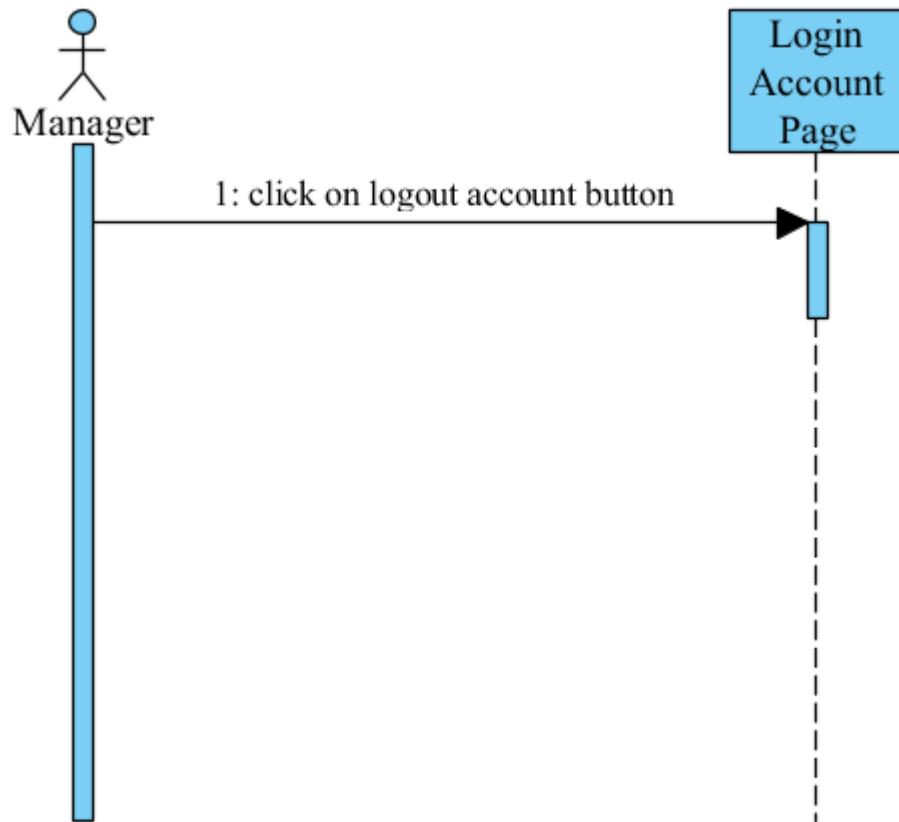


View Specific Dealer Report:



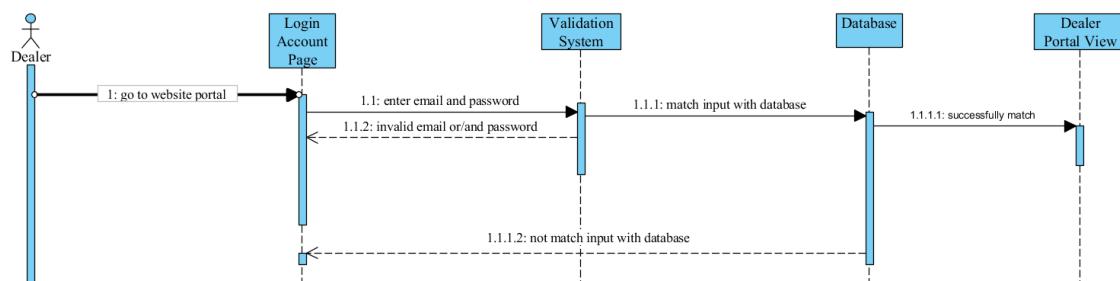
View All Dealers:

Logout Manager Account:

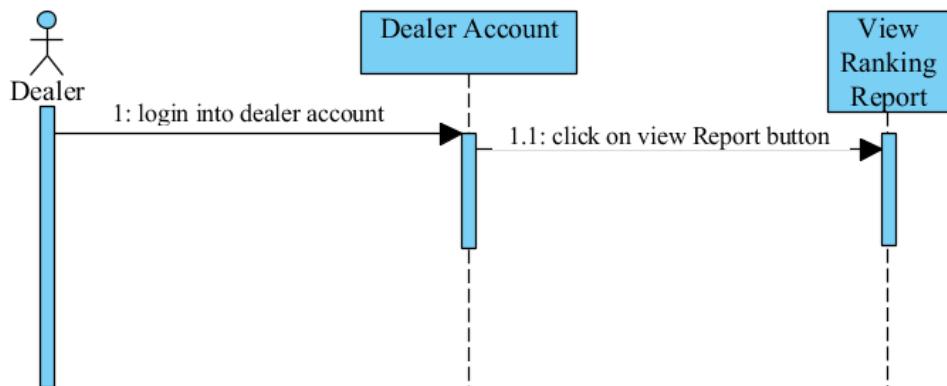


Sequence for Dealer

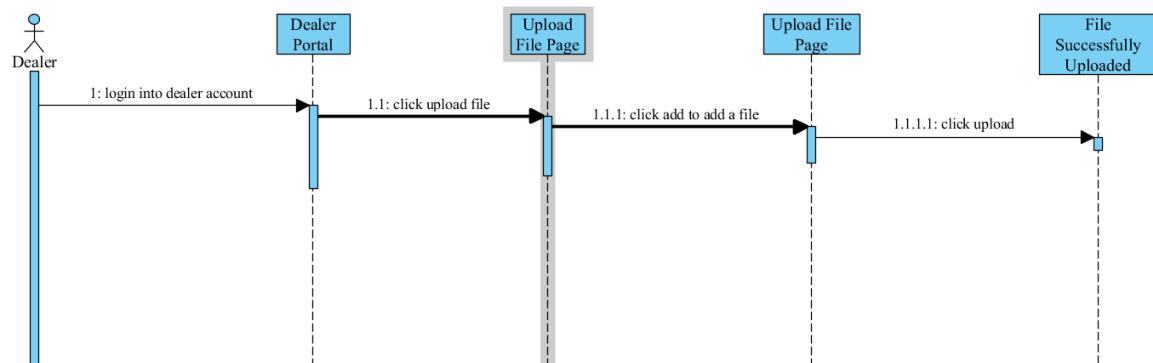
Login Dealer Account:

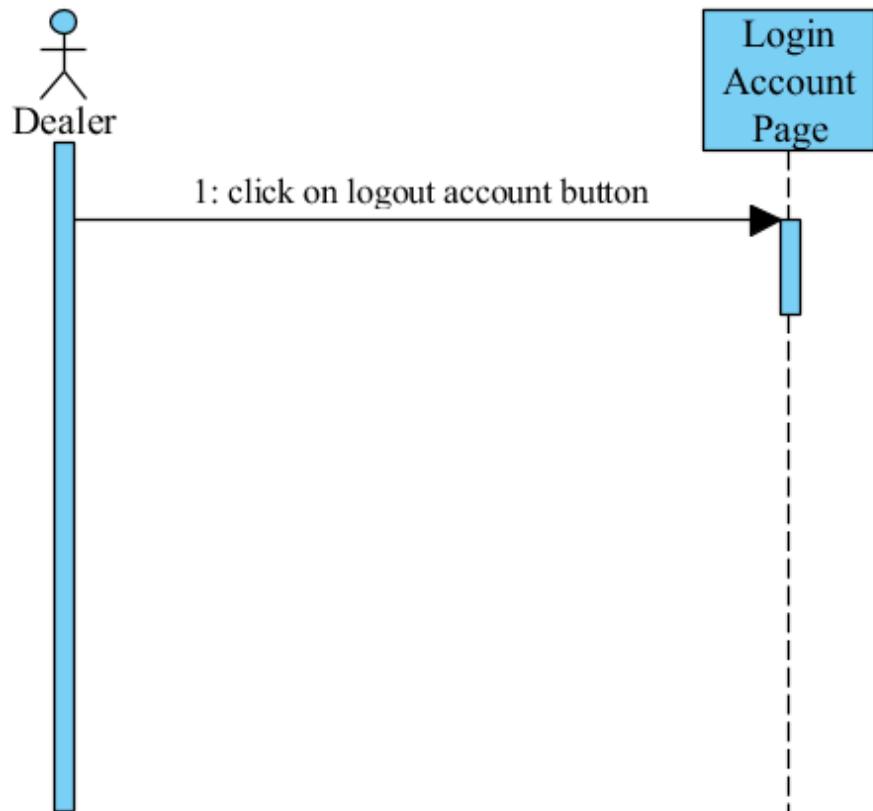


Dealer View Report:



Upload File:

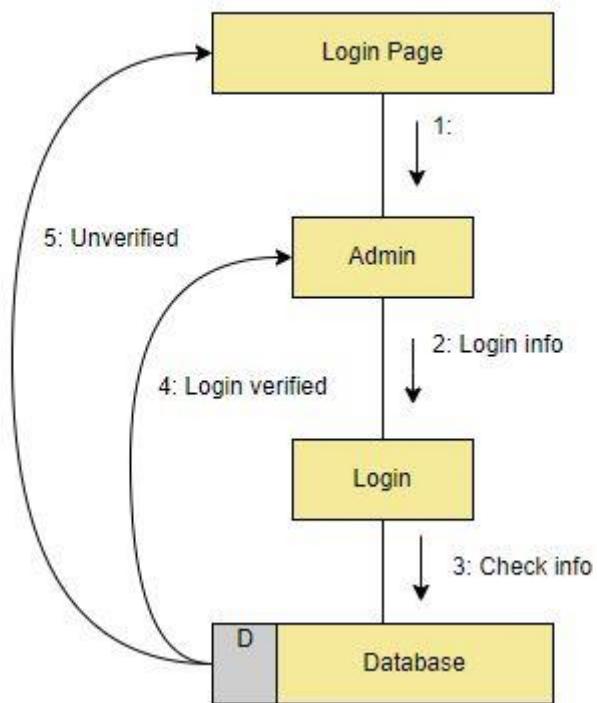


Logout Dealer Account:

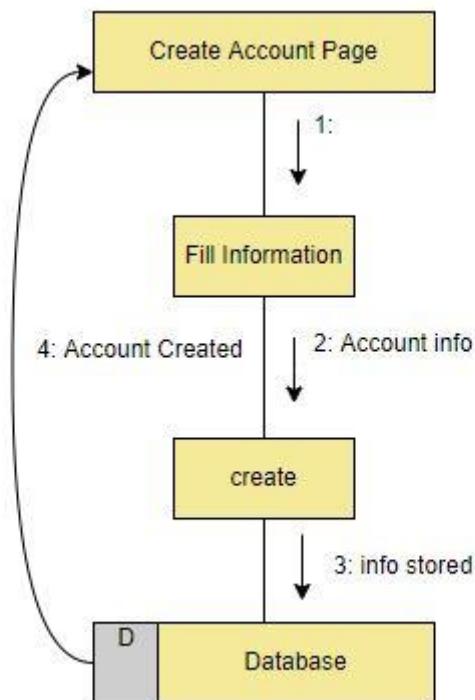
Collaboration Diagram

Collaboration for Admin

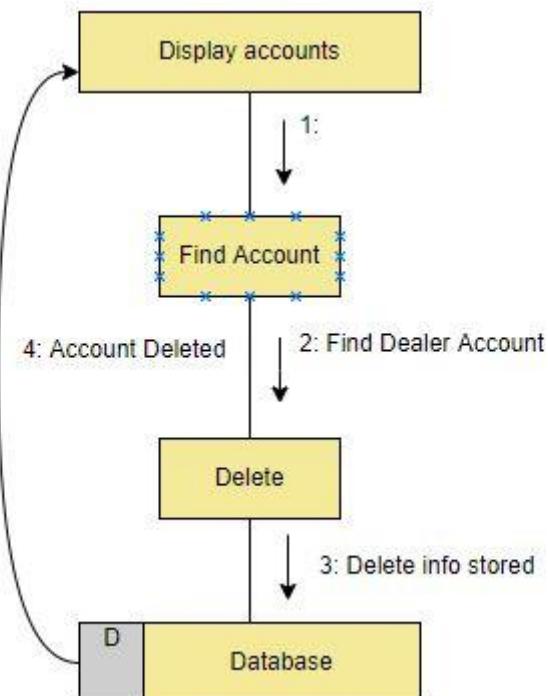
Login Admin Account



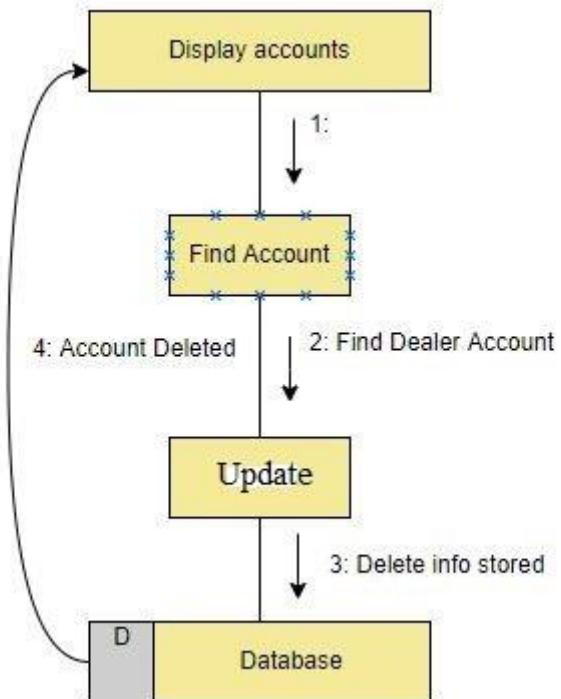
Create Account



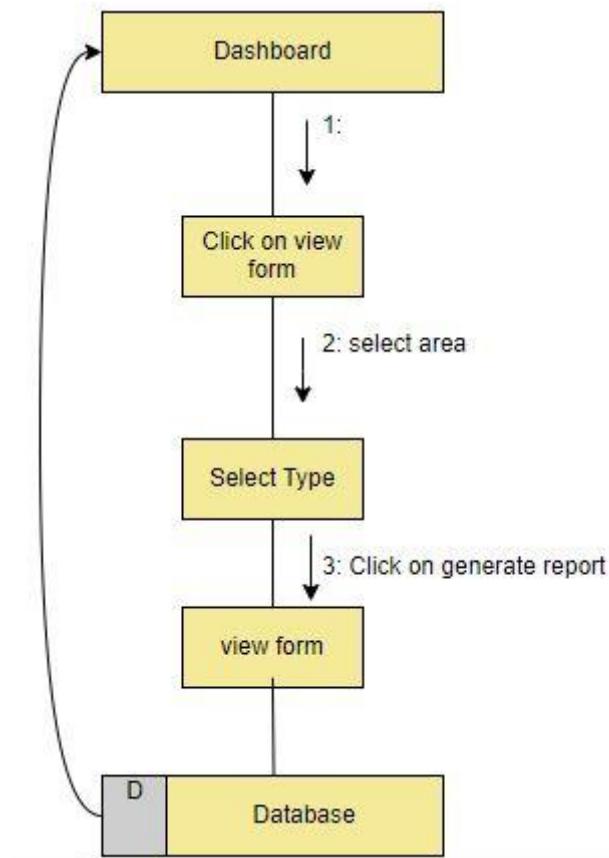
Delete Account



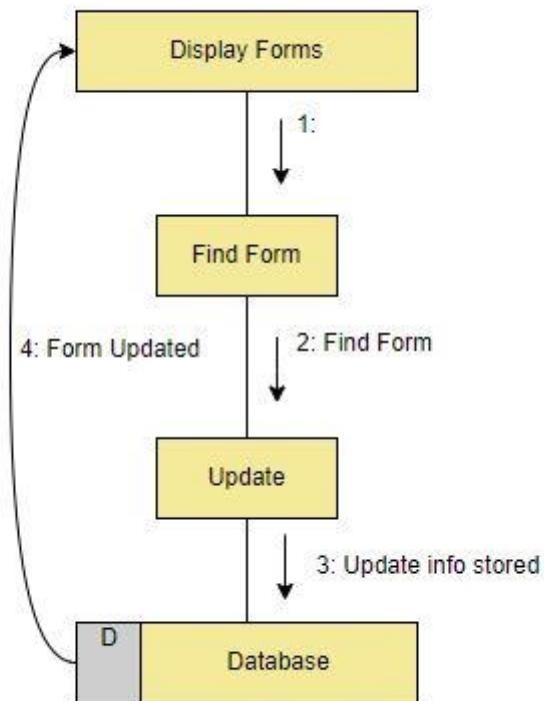
Update Account



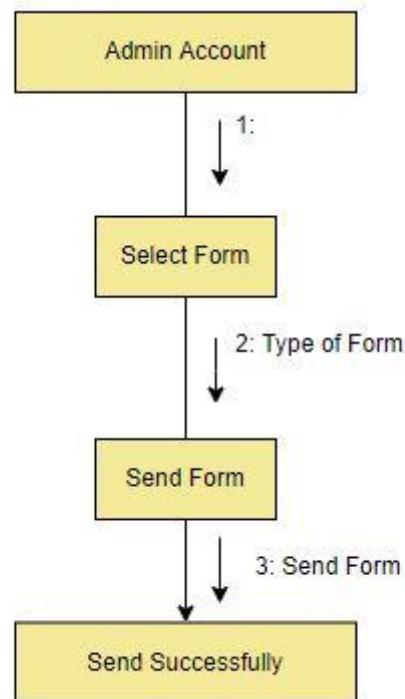
View Form



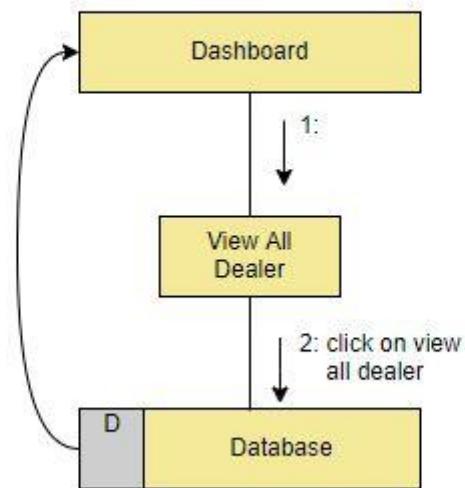
Update Form



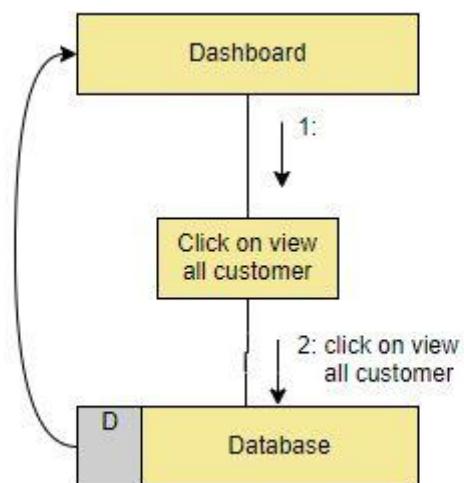
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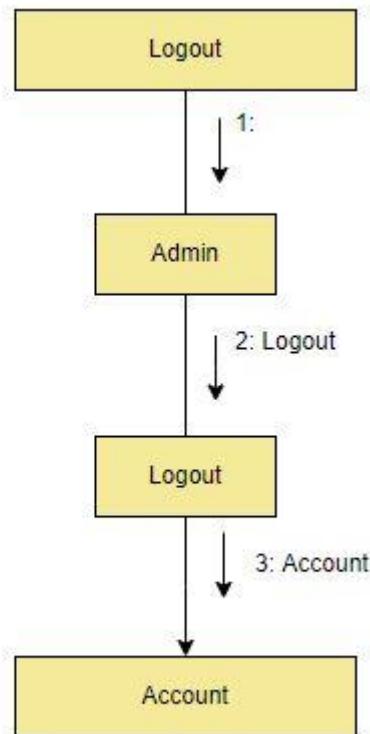
View All Dealers



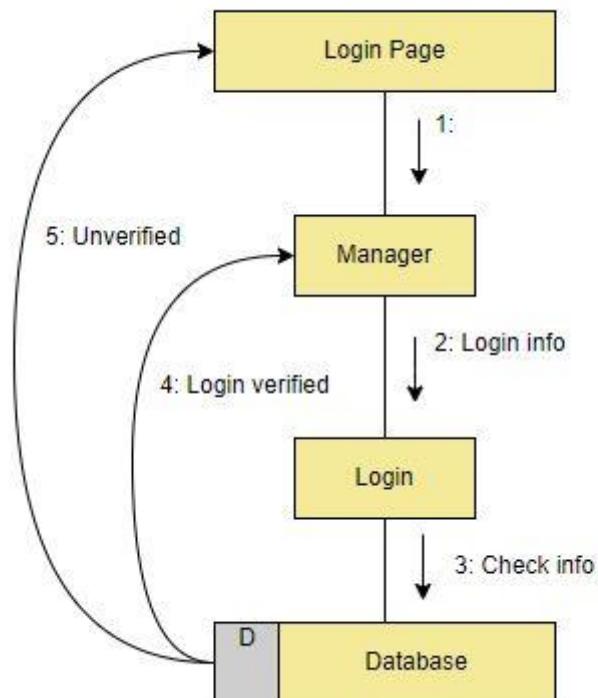
View All Customers



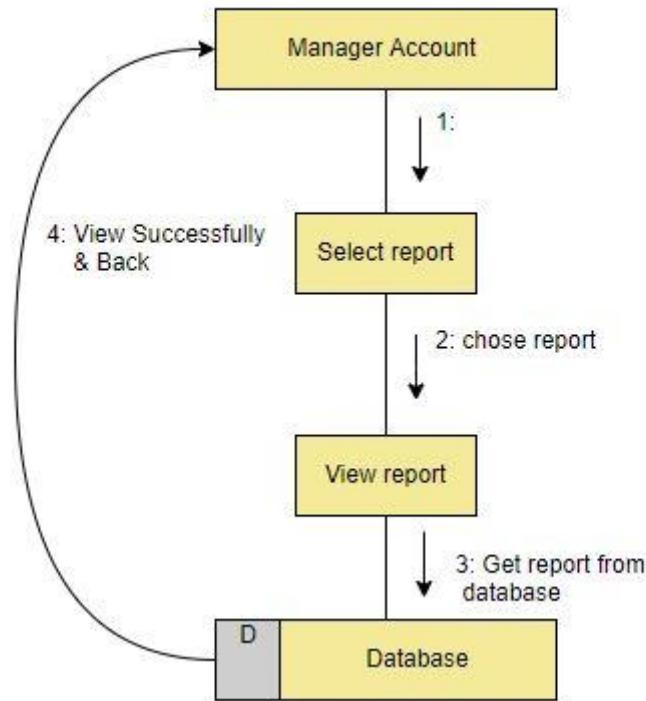
Logout Admin Account



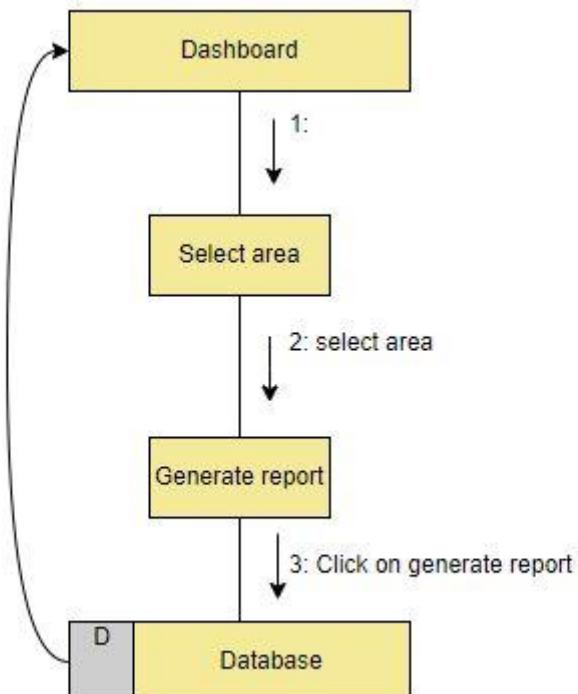
Collaboration for Manager Login Manager Account



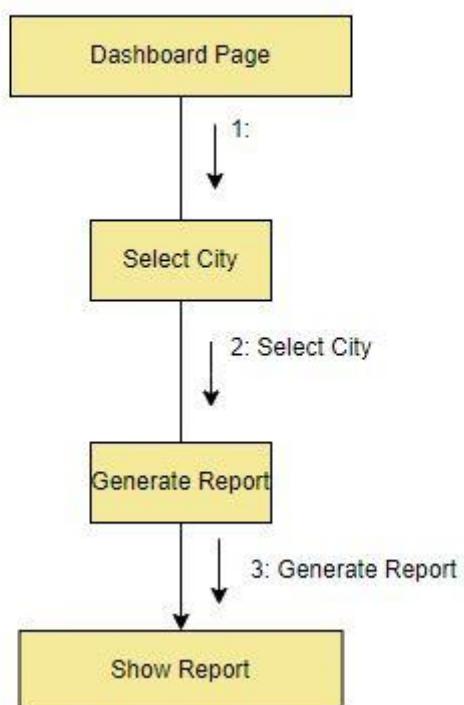
View Reports



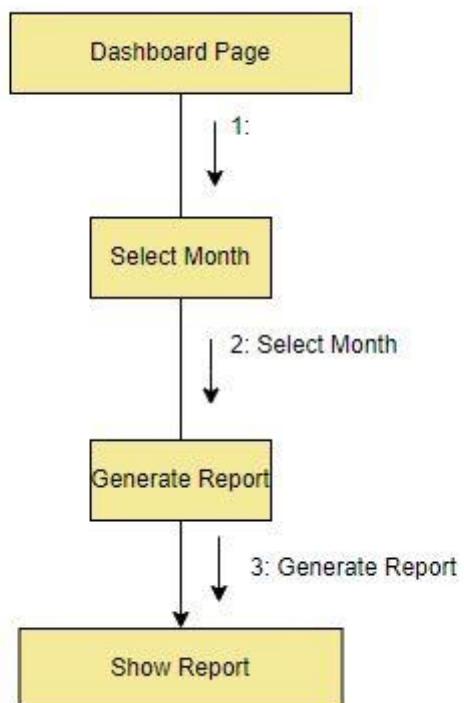
Area Wise Reports View



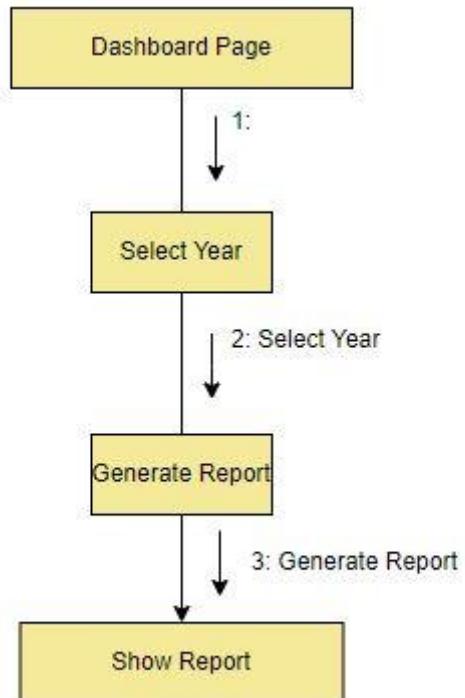
City Wise Reports View



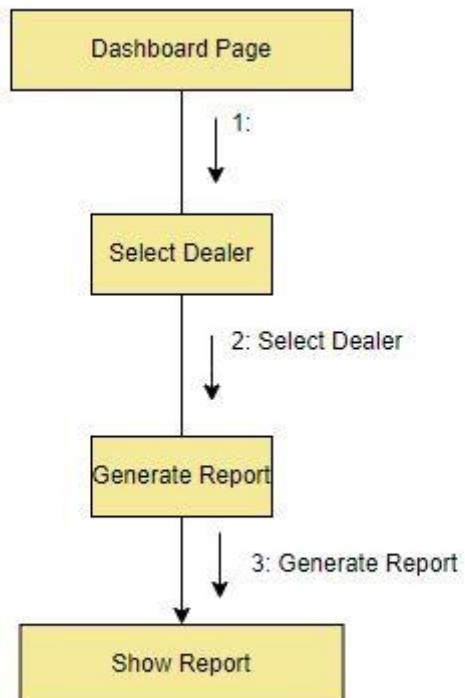
Month Wise Reports View



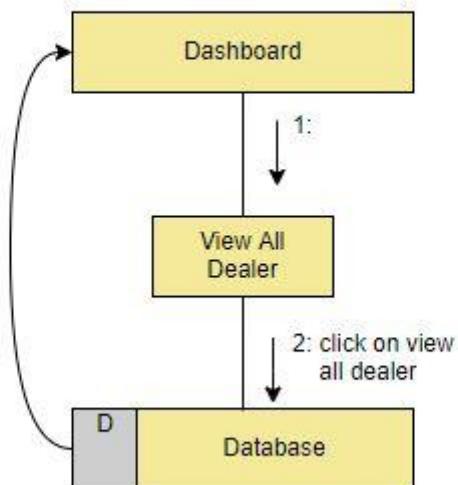
Year Wise Reports View



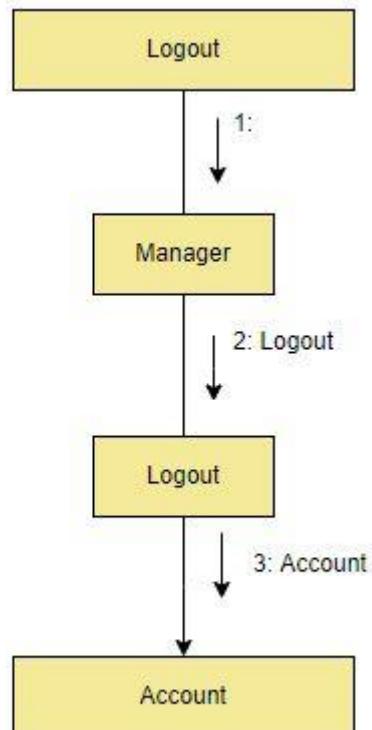
Dealer Wise Reports View



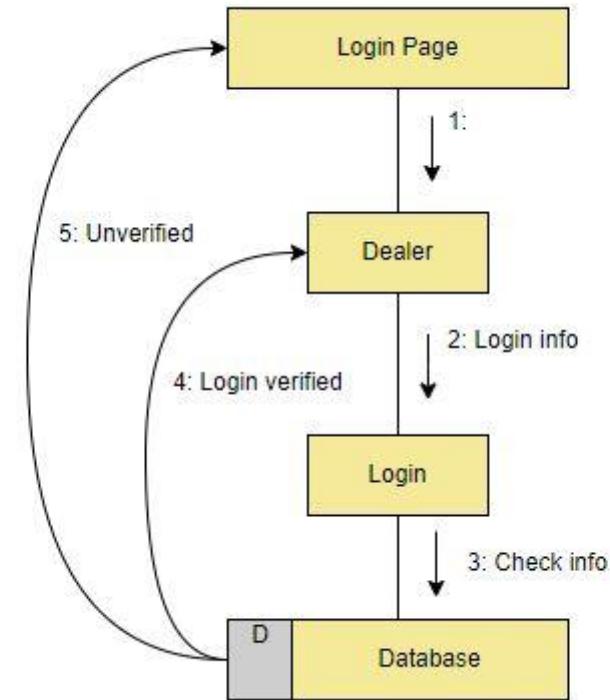
View All Dealers



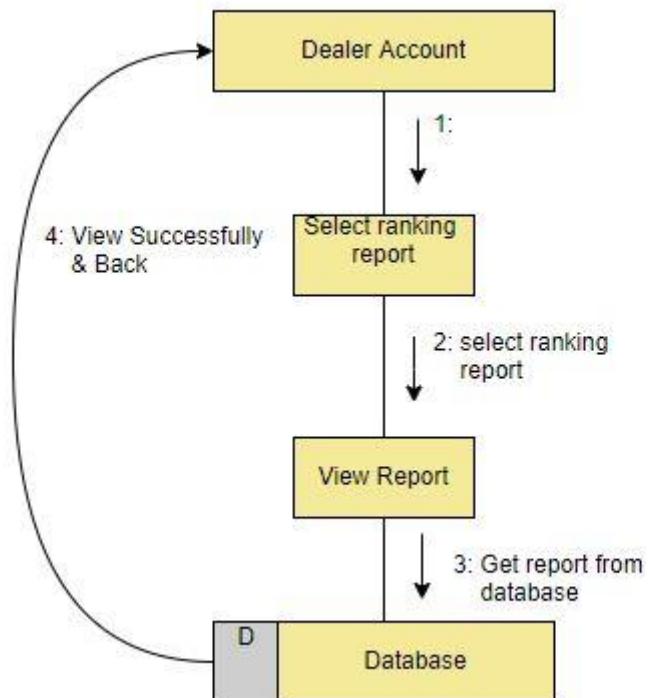
Logout Manager Account



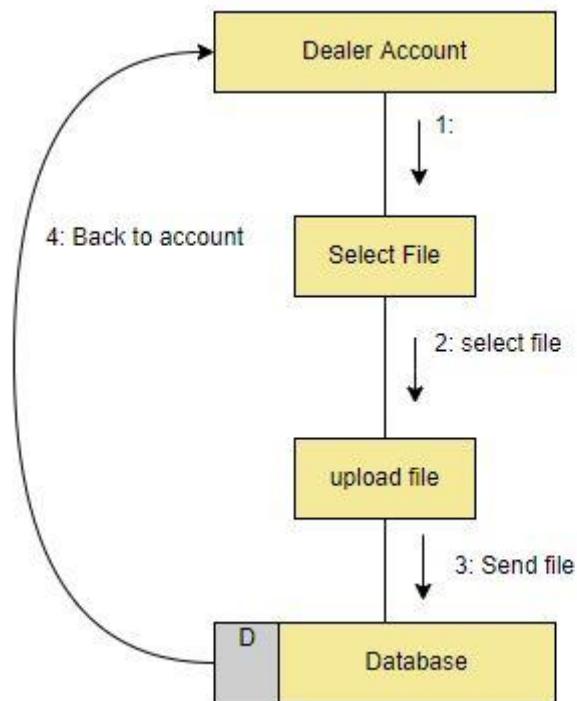
Collaboration for Dealer Login Dealer Account



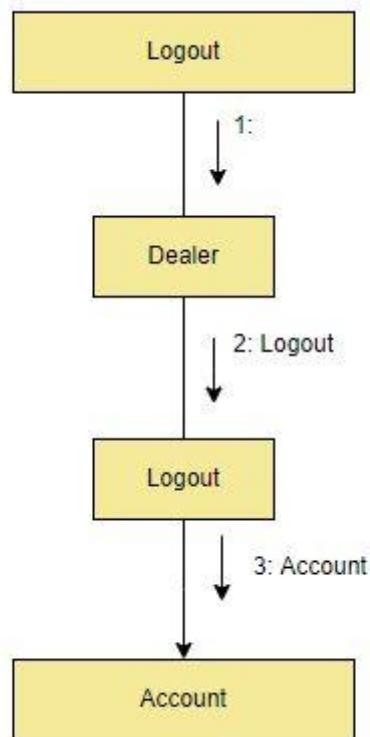
Dealer View Reports



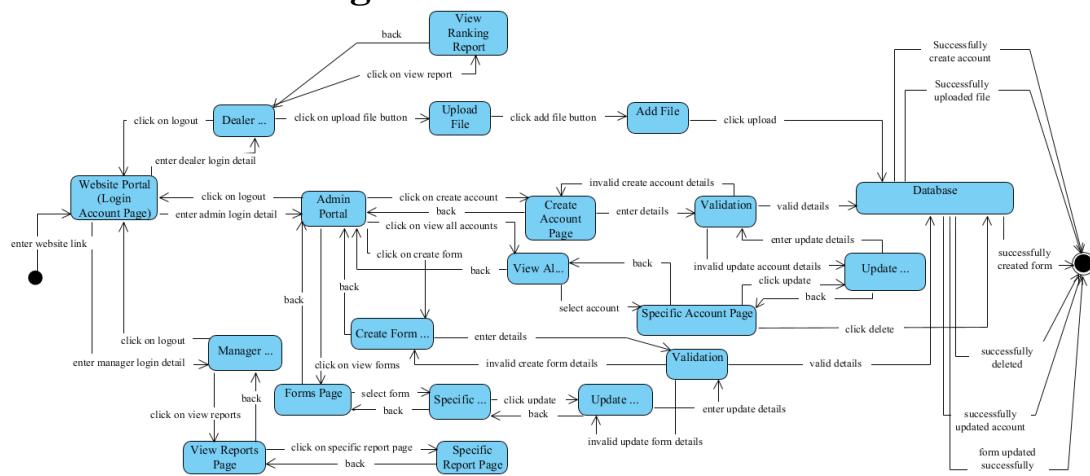
Upload File



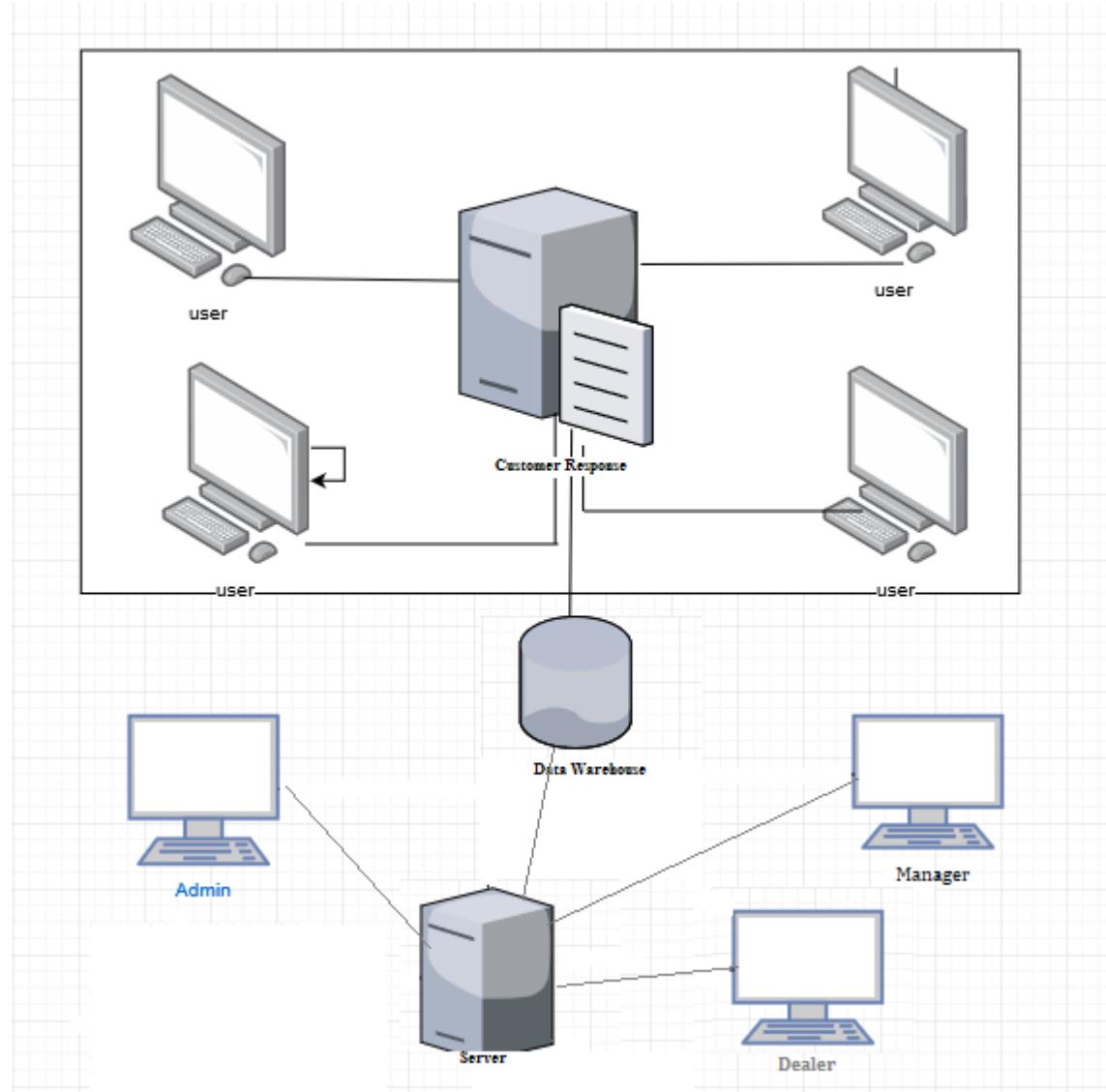
Logout Dealer Account



State Transition Diagram



Deployment Diagram



Chapter 5: Testing



Test Case Specification

Test Case for Login Account of Admin

Positive Test Case	
ID	TC01
Priority	High
Description	To verify admin authentication from system
Reference	Functional Requirement
Users	Administrator
Pre-requisites	<p>System is online.</p> <p>Admin must have active login credentials provided by system administrator.</p> <p>Admin has internet access.</p> <p>Admin Need to submit credential.</p>
Steps	<p>Open the web link to system.</p> <p>Enter Username.</p> <p>Enter Password.</p> <p>Press Login.</p>
Input	Username and password
Expected result	Successfully enters to system and admin home page opens.
Status	Tested, passed.

Negative Test Case	
ID	TC_01
Priority	High
Description	To verify admin authentication from system
Reference	Functional Requirement
Users	Administrator
Pre-requisites	<p>System is online.</p> <p>Admin must have active login credentials provided by system administrator</p> <p>Admin has internet access.</p> <p>Admin Need to submit credential.</p>
Steps	<p>Open the web link to system.</p> <p>Enter Username.</p> <p>Enter Password.</p> <p>Press Login.</p>
Input	Incorrect Username or password or deactivated credentials.
Expected result	Does not allows access to system features and notify the error.
Status	Tested, passed.

Test Case for logout of admin

Positive Test Case	
ID	TC02
Priority	High
Description	To logout admin account to system and go to login page
Reference	Functional Requirement reference
Users	Administrator
Pre-requisites	System is online. Admin must logged in previously. Admin has internet access. Admin Need to click logout button.
Steps	Go to header Click on logout button
Input	Click on logout button
Expected result	Successfully logout the system and go to the login page.
Status	Tested, passed.

Negative Test Case	
ID	TC_02
Priority	High
Description	To logout admin account from system and go to login page
Reference	Functional Requirement reference
Users	Administrator
Pre-requisites	System is online. Admin must logged in previously. Admin has internet access. Admin Need to click logout button.
Steps	Go to header Click on logout button
Input	Not Click on logout button
Expected result	Not Successfully logout the system.
Status	Tested, passed.

Test Case for Create Account

Positive Test Case	
ID	TC03
Priority	Medium
Description	To Create Dealer Account
Reference	Functional Requirement Reference
Users	Administrator
Pre-requisites	System is Online. Admin must Logged in. Admin has Internet Access.
Steps	Go to Create Account Page Enter all Required Information of Dealer Press Create Button
Input	Enter Required Dealer Data
Expected result	Account Created Successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_03
Priority	Medium
Description	To Create Dealer Account
Reference	Functional Requirement reference
Users	Administrator
Pre-requisites	System is Online. Admin must Logged in. Admin has Internet Access
Steps	Go to Create Account Page Enter all Required Information of Dealer Press Create Button
Input	Not Fill Required Dealer Data
Expected result	Account Not Created Successfully or Notifies Error
Status	Tested, Passed.

Test Case for update Account

Positive Test Case	
ID	TC04
Priority	Medium
Description	To Update Dealer Account
Reference	Functional Requirement Reference
Users	Administrator
Pre-requisites	System is Online Admin Must Logged in Previously Admin has Internet Access
Input	Enter Which you want Update the Dealer Detail
Expected result	Account Update Successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_04
Priority	Medium
Description	To Update Dealer Account
Reference	Functional Requirement Reference
Users	Administrator
Pre-requisites	System is Online Admin Must Logged in Previously Admin has Internet Access
Steps	Go to View All Dealer Page Search Dealer and Click on View Detail Button Press Update Button Update Page open and Enter Detail which you want Update
Input	Dealer Detail Enter Incorrectly.
Expected result	Notifies Error
Status	Tested, Passed.

Test Case for Delete Account

Positive Test Case	
ID	TC05
Priority	Medium
Description	To Delete Dealer Account
Reference	Functional Requirement Reference

Users	Administrator
Pre-requisites	System is online. Admin must logged in previously. Admin has internet access.
Steps	Go to View All Dealer Page Search Dealer and Click on View Detail Button Press Delete Button and Account Deleted Successfully
Input	Click on Delete Button
Expected result	Account Deleted Successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_05
Priority	Medium
Description	To Delete Dealer Account
Reference	Functional Requirement Reference
Users	Administrator
Pre-requisites	System is online. Admin must logged in previously. Admin has internet access.
Steps	Go to View All Dealer Page Search Dealer and Click on View Detail Button Press Delete Button and Account Deleted Successfully
Input	Not Click on Delete Button
Expected result	Account not Deleted or Error
Status	Tested, Passed

Test Case for Update Form

Positive Test Case	
ID	TC06
Priority	Medium
Description	To update questionnaire form
Reference	Functional Requirement reference

Users	Administrator
Pre-requisites	System is online. Admin must logged in Admin has internet access.
Steps	Go to view form page Chose type sale or service Select Question Which you want Update Click on Update Button
Input	Enter Question or Multiple Choices
Expected result	Successfully Update and go to Form Page
Status	Tested, Passed

Negative Test Case	
ID	TC_06
Priority	Medium
Description	To Update Questionnaire Form
Reference	Functional Requirement Reference
Users	Administrator
Pre-requisites	System is Online. Admin must Logged in Admin has Internet Access.
Steps	Go to View Form Page Choose Type Sale or Service Select Question Which you want Update Click on Update Button
Input	Blank Question field or Choices
Expected result	Notifies Error
Status	Tested, Passed.

Test Case for Send Sale Form

Positive Test Case	
ID	TC07
Priority	Medium
Description	To Send Sale Questionnaire Form to Customer's
Reference	Functional Requirement Reference

Users	Administrator
Pre-requisites	System is online Admin must logged in Admin has internet access
Steps	Click on Send Sale Form
Input	Click on Send Sale Form Button
Expected result	Send Successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_07
Priority	Medium
Description	To Send Questionnaire Form to Customer's
Reference	Functional Requirement Reference
Users	Administrator
Pre-requisites	System is online. Admin must logged in previously. Admin has internet access.
Steps	Click on send sale form
Input	Not Click on Send Sale Form Button
Expected result	Not Send
Status	Tested, Passed.

Test Case for Send Service Form

Positive Test Case	
ID	TC08
Priority	Medium
Description	To Send Service Questionnaire Form to Customer's
Reference	Functional Requirement Reference

Users	Administrator
Pre-requisites	System is Online. Admin must Logged in Admin has Internet Access.
Steps	Click on Send Service Form Button
Input	Click on Send Service Form Button
Expected result	Send Successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_08
Priority	Medium
Description	To Send Questionnaire Form to Customer's
Reference	Functional Requirement reference
Users	Administrator
Pre-requisites	System is online. Admin must logged in Admin has internet access.
Steps	Click on send service form
Input	Not Click on Send Service Form Button
Expected result	Not Send
Status	Tested, Passed.

Test Case for Login Account of Manager

Positive Test Case	
ID	TC09
Priority	High
Description	To Verify Manager Authentication from System
Reference	Functional Requirement Reference

Users	Manager
Pre-requisites	System is online. Manager must have active login credentials provided by system Manager has internet access. Manager Need to submit credential.
Steps	Open the web link to system. Enter Username Enter Password Click on Login Button
Input	Enter Username or password
Expected result	Successfully Login and Manager Home Page Open
Status	Tested, Passed

Negative Test Case	
ID	TC_09
Priority	High
Description	To Verify Manager Authentication to System
Reference	Functional Requirement Reference
Users	Manager
Pre-requisites	System is online Manager Must have Active Login Credentials Manager has internet access Manager Need to submit credential
Steps	Open the web link to system. Enter Username Enter Password Click on login button
Input	Incorrect Username or Password or deactivated credentials
Expected result	Does not allows access to system features and notifies the error
Status	Tested, Passed.

Test Case for logout of Manager

Positive Test Case	
ID	TC10
Priority	High
Description	To logout admin account to system and go to login page
Reference	Functional Requirement reference

Users	Manager
Pre-requisites	System is online. Manager must logged in previously. Manager has internet access. Manager Need to click logout button.
Steps	Go to header Click on logout button
Input	Click on logout button
Expected result	Successfully logout the system and manager home page open
Status	Tested, Passed.

Negative Test Case	
ID	TC_10
Priority	High
Description	To logout admin account to system and go to login page
Reference	Functional Requirement reference
Users	Manager
Pre-requisites	System is online. Manager must logged in previously. Manager has internet access. Manager Need to click logout button.
Steps	Go to header Click on logout button
Input	Not Click on logout button
Expected result	Not Successfully logout
Status	Tested, Passed.

Test Case for Dashboard Report

Positive Test Case	
ID	TC11
Priority	Medium
Description	To check dashboard Report
Reference	Functional Requirement Reference

Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select dashboard report
Input	Click on dashboard report
Expected result	Reports show successfully
Status	Tested, passed.

Negative Test Case	
ID	TC_11
Priority	Medium
Description	To check dashboard Report
Reference	Functional Requirement Reference
Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select dashboard report
Input	Not click on dashboard report
Expected result	Reports not show
Status	Tested, passed.

Test Case for Benchmark Report

Positive Test Case	
ID	TC12
Priority	Medium
Description	To check benchmark report
Reference	Functional Requirement reference

Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select benchmark report
Input	Click on benchmark report
Expected result	Reports show successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_12
Priority	Medium
Description	To check benchmark report
Reference	Functional Requirement Reference
Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select benchmark report
Input	Not click on benchmark report
Expected result	Reports not show
Status	Tested, Passed.

Test Case for Ranking Report

Positive Test Case	
ID	TC13
Priority	Medium
Description	To check ranking report
Reference	Functional Requirement Reference

Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select view all dealer Select dealer which you want to view rank report Click on view report and report show
Input	Click on view report
Expected result	Reports show successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_13
Priority	Medium
Description	To check report show correctly
Reference	Functional Requirement reference
Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select view all dealer Select dealer which you want to view rank report Click on view report and report show
Input	Not click on view report
Expected result	Reports not show
Status	Tested, Passed.

Test Case for Trend Report

Positive Test Case	
ID	TC14
Priority	Medium
Description	To check trend report show
Reference	Functional Requirement Reference

Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select trend report
Input	Click on trend report
Expected result	Reports show successfully
Status	Tested, Passed.

Negative Test Case	
ID	TC_14
Priority	Medium
Description	To check report show correctly
Reference	Functional Requirement reference
Users	Manager
Pre-requisites	System is online. Manager must logged in Manager has internet access
Steps	Select trend report
Input	Not click on trend report
Expected result	Reports not show
Status	Tested, Passed.

Test Case for Login Account of Dealer

Positive Test Case	
ID	TC15
Priority	High
Description	To verify dealer authentication from system
Reference	Functional Requirement Reference

Users	Dealer
Pre-requisites	System is online. Dealer must have active login credentials Dealer has internet access. Dealer Need to submit credential.
Steps	Open the web link to system. Enter Username or email Enter Password. Press Login.
Input	Enter username,email or password
Expected result	Successfully enters the system and Dealer home page
Status	Tested, Passed.

Negative Test Case	
ID	TC_15
Priority	High
Description	To verify dealer authentication from system
Reference	Functional Requirement reference
Users	Dealer
Pre-requisites	System is online Dealer must have active login credentials Dealer has internet access Dealer Need to submit credential
Steps	Open the web link to system. Enter Username or email Enter Password Press Login
Input	Enter Incorrect username, email or password or deactivated credentials.
Expected result	Does not allows access to system features and notifies the error.
Status	Tested, Passed.

Test Case for logout of Dealer

Positive Test Case	
ID	TC16
Priority	High
Description	To logout admin account to system and go to dealer login page

Reference	Functional Requirement Reference
Users	Dealer
Pre-requisites	System is online. Dealer must logged in previously. Dealer has internet access. Dealer Need to click logout button.
Steps	Go to header Click on logout button
Input	Click on logout button
Expected result	Successfully logout the system and dealer login page open.
Status	Tested, Passed.

Negative Test Case	
ID	TC_16
Priority	High
Description	To logout admin account to system and go to dealer login page
Reference	Functional Requirement reference
Users	Dealer
Pre-requisites	System is online. Dealer must logged in previously. Dealer has internet access. Dealer Need to click logout button.
Steps	Go to header Click on logout button
Input	Not Click on logout button
Expected result	Not Successfully logout the system
Status	Tested, Passed.

Test Case for Ranking Report of dealer

Positive Test Case	
ID	TC17
Priority	Medium
Description	To check ranking report show
Reference	Functional Requirement Reference

Users	Dealer
Pre-requisites	System is online. Dealer must logged in Dealer has internet access
Steps	Select ranking report
Input	Click on ranking report
Expected result	Reports show successfully
Status	Tested, passed.

Negative Test Case	
ID	TC_17
Priority	Medium
Description	To check report show correctly
Reference	Functional Requirement reference
Users	Dealer
Pre-requisites	System is online. Dealer must logged in Dealer has internet access
Steps	Select ranking report
Input	Not click on ranking report
Expected result	Reports not show
Status	Tested, Passed.

Test Case for upload file of dealer

Positive Test Case	
ID	TC18
Priority	Medium
Description	To upload file successfully
Reference	Functional Requirement reference

Users	Dealer
Pre-requisites	System is online. Dealer must logged in. Dealer has internet access
Steps	Select upload file Chose file to upload Click on upload button
Input	Chose file and select file
Expected result	File upload successfully
Status	Tested, passed.

Negative Test Case	
ID	TC_18
Priority	Medium
Description	To upload file successfully
Reference	Functional Requirement reference
Users	Dealer
Pre-requisites	System is online. Dealer must logged in Dealer has internet access
Steps	Select upload file Chose file to upload Click on upload button
Input	File not selected
Expected result	File not upload and notify error
Status	Tested, Passed.

Black Box Test Cases

Equivalence Partitions (EP)

Equivalence Partitions for Admin Login Authentication

Variables	Valid Class	Invalid Class
Username	1. Only username “admin”. 2. Case sensitive.	1. Alphabets, digits and symbols

	3. Compulsory field.	other than "admin". 2. Empty field
Password	1. Length should be greater than or equal to 5. 2. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 3. Compulsory field.	1. Length less than 5 characters. 2. Empty field.

Equivalence Partitions for Create Account

Variable	Valid Class	Invalid Class
First Name	1. May contains only alphabets [a-z A-Z]. 2. Compulsory field.	1. Digits and symbols other than [a-z A-Z]. 2. Empty field.
Last Name	1. May contains only alphabets [a-z A-Z]. 2. Compulsory field.	1. Digits and symbols other than [a-z A-Z]. 2. Empty field.
Phone Number	1. Length should be equal to 11. 2. May contains only digits [0-9]. 3. Compulsory field.	1. Length less than 11 digits. 2. Empty field.
CNIC Number	1. Length should be equal to 13. 2. May contains only digits [0-9]. 3. Compulsory field.	1. Length less than 13 digits. 2. Empty field.
City	1. Choose city from radio button. 2. Compulsory choice	1. Empty choice
Address	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 2. Compulsory field.	1. Empty field.
Username	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 2. Compulsory field.	1. Empty field.
Email	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 2. Compulsory field.	1. Empty field

Password	<ol style="list-style-type: none"> 1. Length should be greater than or equal to 5. 2. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 3. Compulsory field. 	<ol style="list-style-type: none"> 1. Length less than 5 characters. 2. Empty field.
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Equivalence Partitions for Create Sale Form

Variable	Valid Class	Invalid Class
Question 1	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 2	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 3	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 4	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 5	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 6	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field

Question 7	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 8	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 9	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 10	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field

Equivalence Partitions for Create Service Form

Variable	Valid Class	Invalid Class
Question 1	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 2	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 3	<ol style="list-style-type: none"> 1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field. 	<ol style="list-style-type: none"> 1. Empty field
Question 4	<ol style="list-style-type: none"> 1. May contain symbols, alphabets 	<ol style="list-style-type: none"> 1. Empty field

	[a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field.	
Question 5	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field.	1. Empty field
Question 6	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 1. Compulsory field.	1. Empty field
Question 7	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field.	1. Empty field
Question 8	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field.	1. Empty field
Question 9	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field.	1. Empty field
Question 10	1. May contain symbols, alphabets [a-z A-Z] and digits [0-9] and 5 choices. 2. Compulsory field.	1. Empty field

Equivalence Partitions for Manager Login Authentication

Variables	Valid Class	Invalid Class
Username	1. Only username “manager”. 2. Case sensitive. 3. Compulsory field.	1. Alphabets, digits and symbols other than “manager”.

Password	<ol style="list-style-type: none"> 1. Length should be greater than or equal to 5. 2. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 3. Compulsory field. 	<ol style="list-style-type: none"> 2. Empty field
		<ol style="list-style-type: none"> 1. Length less than 5 characters. 2. Empty field.

Equivalence Partitions for Dealer Login Authentication

Variables	Valid Class	Invalid Class
Username	<ol style="list-style-type: none"> 1. Enter username which is provided from company. 2. Case sensitive. 3. Compulsory field. 	<ol style="list-style-type: none"> 1. Alphabets, digits and symbols other than company given username. 2. Empty field
Password	<ol style="list-style-type: none"> 1. Length should be greater than or equal to 5. 2. May contain symbols, alphabets [a-z A-Z] and digits [0-9]. 3. Compulsory field. 	<ol style="list-style-type: none"> 1. Length less than 5 characters. 2. Empty field.

Boundary Value Analysis

Create account

BVA of password

Password field accept minimum 5 characters and maximum 12 characters

Invalid	Valid	Invalid
Less than 5	5 to 12	Greater than 12

BVA of CNIC

CNIC field accept 13 characters

Invalid	Valid	Invalid
Less than 13	13	Greater than 13

BVA of Phone number

Phone number field accept minimum 12 characters and maximum 13 characters

Invalid	Valid	Invalid
Less than 12	12 to 13	Greater than 13

Update account

BVA of password

Password field accept minimum 5 characters and maximum 12 characters

Invalid	Valid	Invalid
Less than 5	5 to 12	Greater than 12

BVA of CNIC

CNIC field accept 13 characters

Invalid	Valid	Invalid
Less than 13	13	Greater than 13

BVA of Phone number

Phone number field accept minimum 12 characters and maximum 13 characters

Invalid	Valid	Invalid
Less than 12	12 to 13	Greater than 13

Decision Table Testing

Decision table for login admin account

Conditions	Rule 1	Rule 2	Rule 3	Rule 4
Username	F	T	F	T
Password	F	F	T	T
Output	Error	Error	Error	True

Decision table for login Dealer account

Conditions	Rule 1	Rule 2	Rule 3	Rule 4
Username	F	T	F	T

Password	F	F	T	T
Output	Error	Error	Error	True

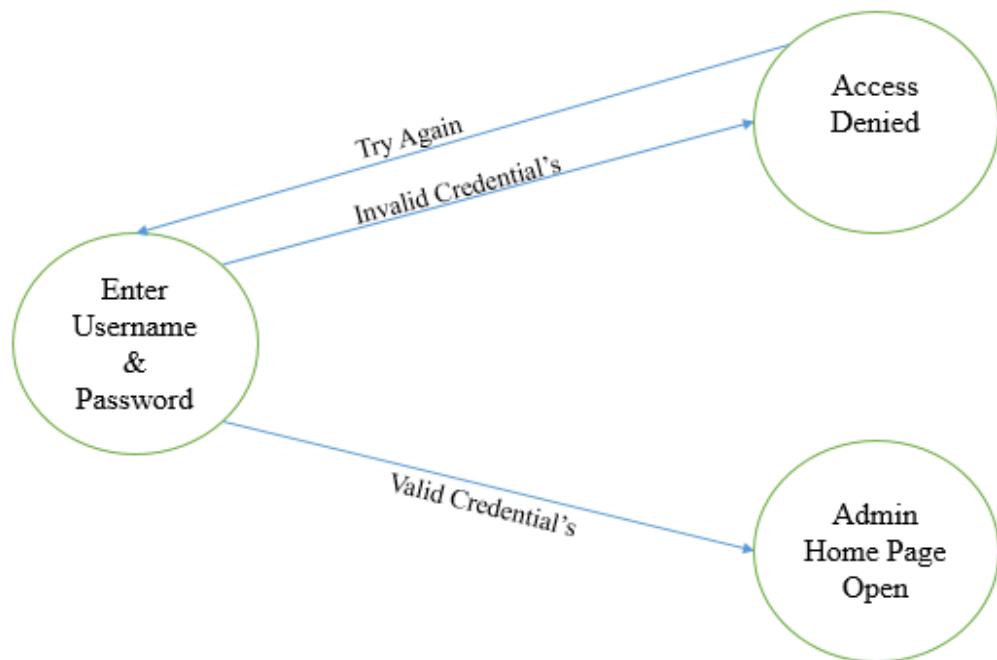
Decision table for login Manager Account

Conditions	Rule 1	Rule 2	Rule 3	Rule 4
Username	F	T	F	T
Password	F	F	T	T
Output	Error	Error	Error	True



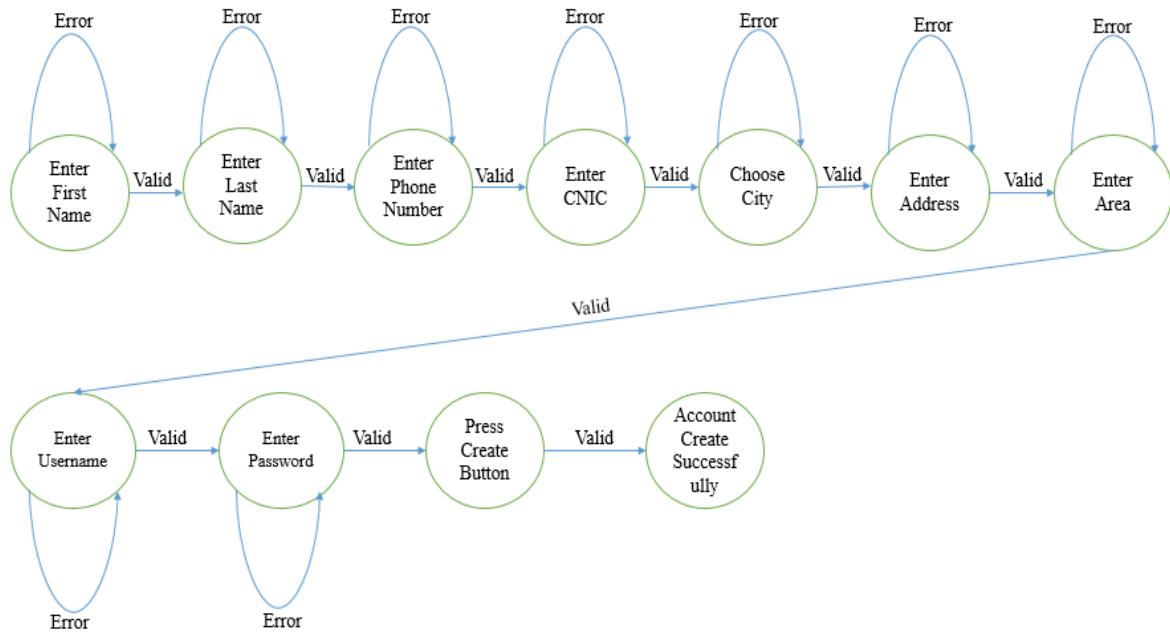
State Transition Testing

State Transition Testing of Admin Login



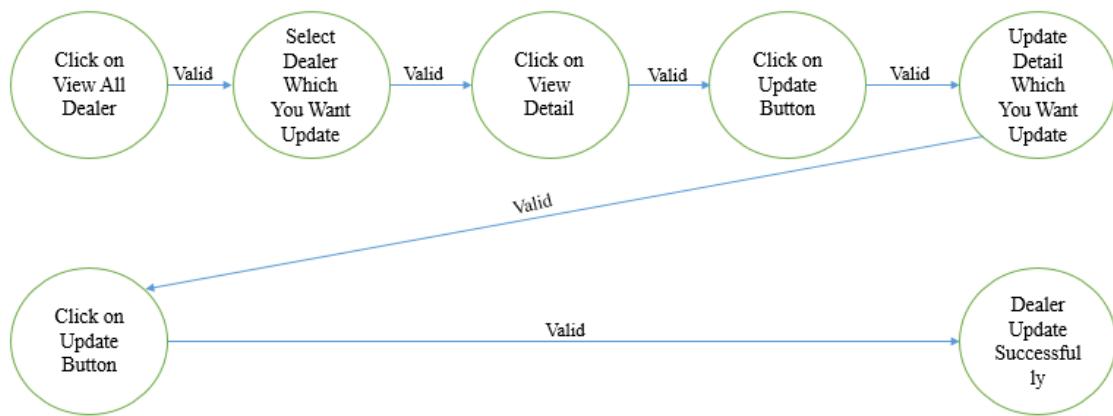
State	Valid Credentials	Invalid Credentials	Try Again
S1)Enter Username and Password	S2	S3	–
S2)Admin Home Page open	–	–	–
S3)Access Denied	–	–	S1

State Transition Testing of Create Account



State	Valid	Error
S1)Enter First Name	S2	S1
S2)Enter Last Name	S3	S2
S3)Enter Phone Number	S4	S3
S4)Enter CNIC	S5	S4
S5)Enter CNIC	S6	S5
S6)Choose City	S7	S6
S7)Enter Address	S8	S7
S8)Enter Area	S9	S8
S9)Enter Username	S10	S9
S10)Enter Password	S11	S10
S11)Press Create Button	S12	
S12)Account Create Successfully	-	-

State Transition Testing of Update Account



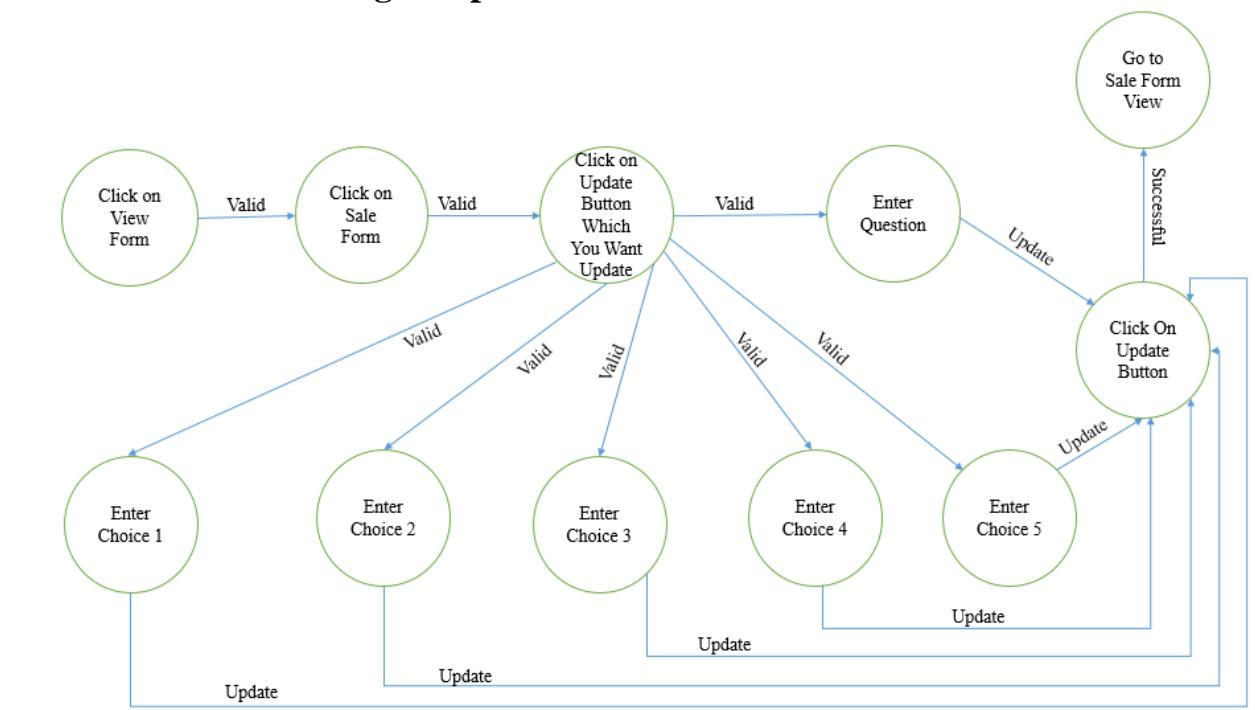
State	Valid
S1)Click on View All Dealer	S2
S2)Select Dealer Which You Want Update	S3
S3)Click on View Detail	S4
S4)Click on Update Button	S5
S5)Update Detail Which You Want Update	S6
S6)Click on Update Button	S7
S7)Dealer Update Successfully	-

State Transition Testing of Delete Account



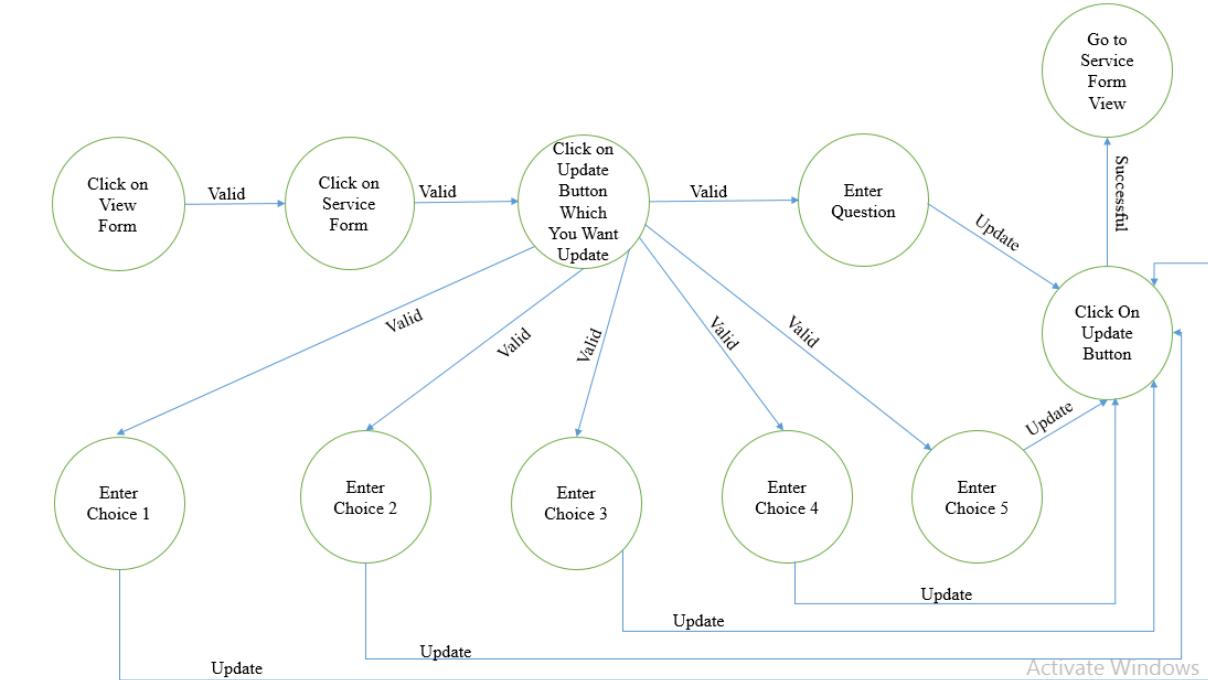
State	Valid
S1)Click on View All Dealer	S2
S2)Select Dealer Which You Want Delete	S3
S3)Click on View Detail	S4
S4)Click on Delete Button	S5
S5)Dealer Delete Successfully	-

State Transition Testing of Update Sale Form



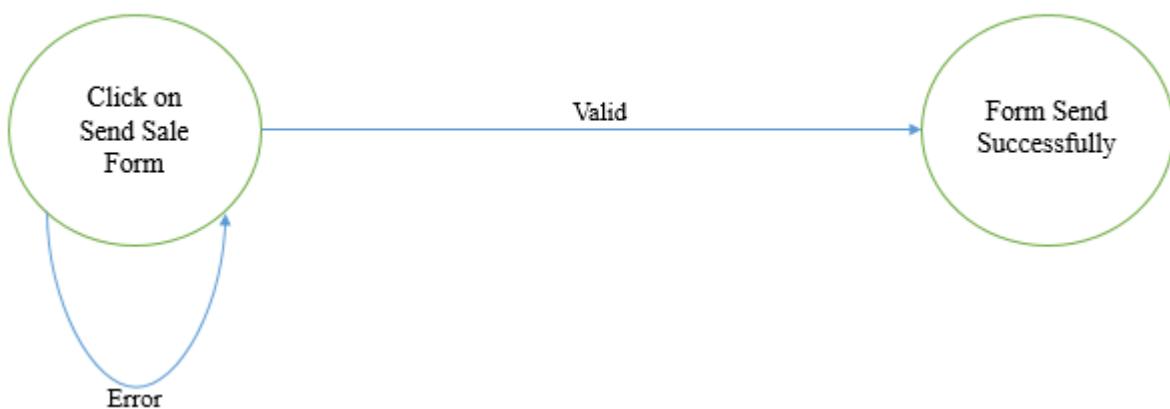
State	Valid	Update	Successful
S1)Click on View Form	S2	-	-
S2)Click on Sale Form	S3	-	-
S3)Click on Update Button Which You Want Update	S4,S5,S6,S7,S8,S9	-	-
S4)Enter Question	-	S10	-
S5)Enter Choice 1	-	S10	-
S6)Enter Choice 2	-	S10	-
S7)Enter Choice 3	-	S10	-
S8)Enter Choice 4	-	S10	-
S9)Enter Choice 5	-	S10	-
S10)Click On Update Button	-	S11	-
S11)Go to Sale Form View	-	-	-

State Transition Testing Update Service form



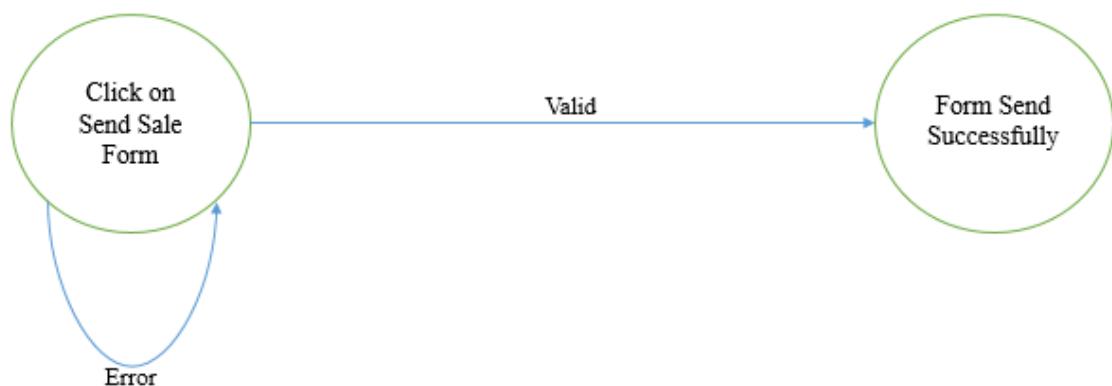
State	Valid	Update	Successful
S1)Click on View Form	S2	-	-
S2)Click on Service Form	S3	-	-
S3)Click on Update Button Which You Want Update	S4,S5,S6,S7,S8,S9	-	-
S4)Enter Question	-	S10	-
S5)Enter Choice 1	-	S10	-
S6)Enter Choice 2	-	S10	-
S7)Enter Choice 3	-	S10	-
S8)Enter Choice 4	-	S10	-
S9)Enter Choice 5	-	S10	-
S10)Click On Update Button	-	S11	-
S11)Go to Service Form View	-	-	-

State Transition Testing Send Sale Form



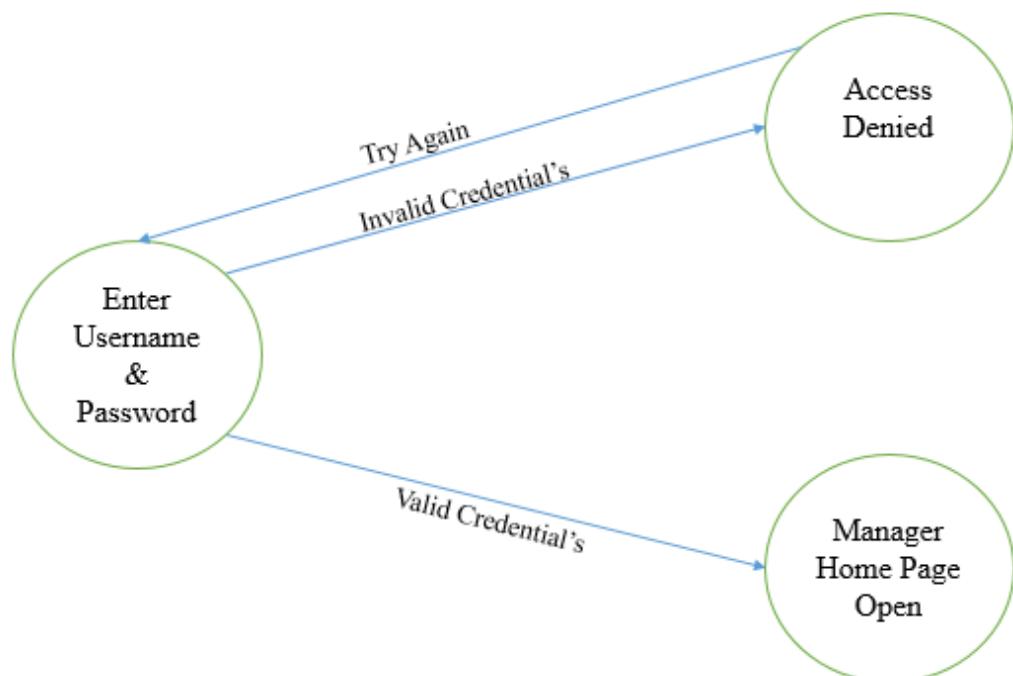
State	Valid	Error
S1)Click on Send Sale Form	S2	S1
S2)Form Send Successfully	-	-

State Transition Testing Send Service Form



State	Valid	Error
S1)Click on Send Service Form	S2	S1
S2)Form Send Successfully	-	-

State Transition Testing Manager Login



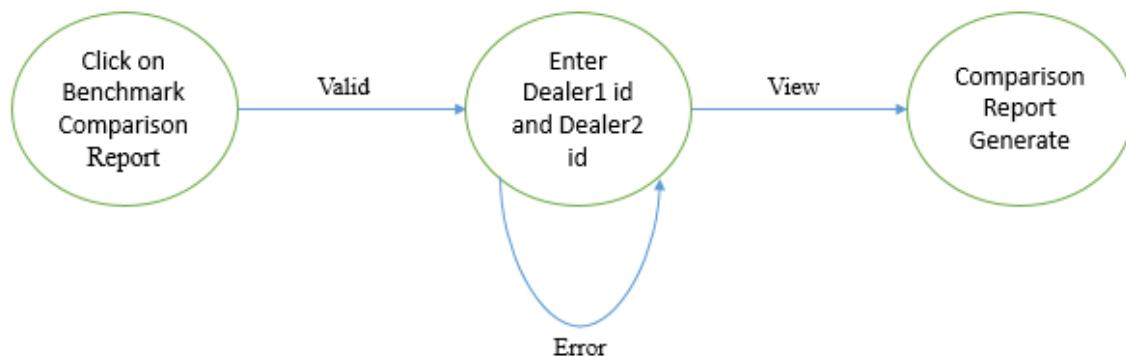
State	Valid Credentials	Invalid Credentials	Try Again
S1)Enter Username and Password	S2	S3	—
S2)Manager Home Page open	—	—	—
S3)Access Denied	—	—	S1

State Transition Testing Dashboard Report View



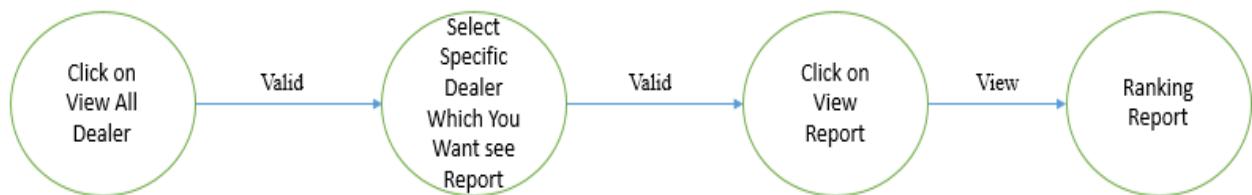
State	Valid	City Wise Report	Area Wise Report
S1)Click on Dashboard Report	S2	—	—
S2)View Complete Report	—	S3	—
S3)Click on Specific City Which You Want See Report	—	S4	—
S4)Click on Specific Area Which You Want See Report	—	—	—

State Transition Testing Benchmark Comparison Report View



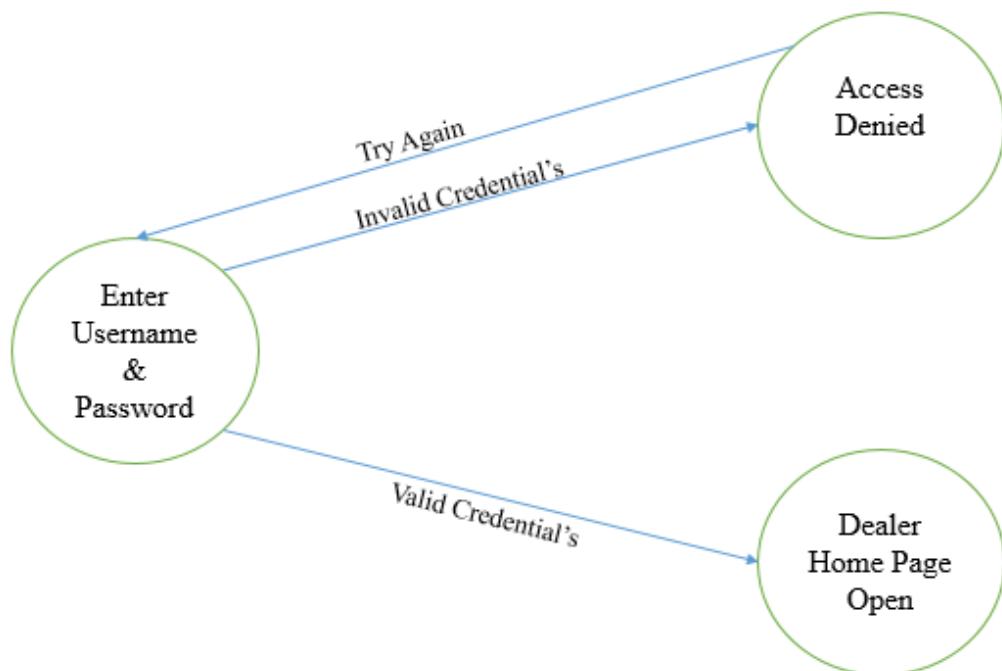
State	Valid	View	Error
S1)Click on Benchmark Comparison Report	S2	-	-
S2)Enter Dealer1 id and Dealer2 id		S3	S2
S3)Comparison Report Generate	-	-	-

State Transition Testing Ranking Report View



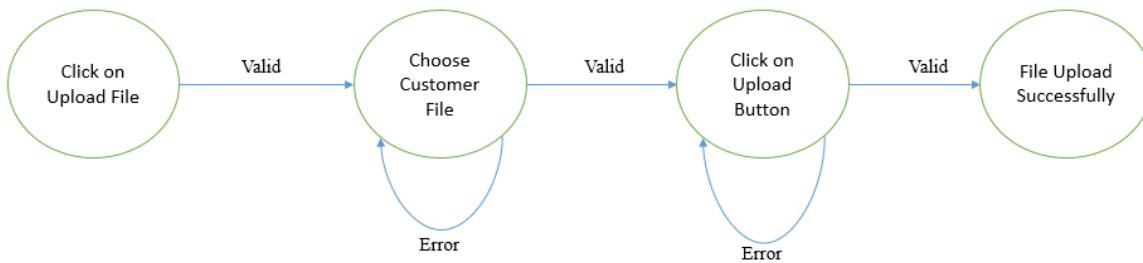
State	Valid	View
S1)Click on View All Dealer	S2	-
S2)Select Specific Dealer Which You Want see Report	S3	-
S3)Click on View Report	-	S4
S4)Ranking Report	-	-

State Transition Testing of Dealer Login



State	Valid Credentials	Invalid Credentials	Try Again
S1)Enter Username and Password	S2	S3	-
S2)Dealer Home Page open	-	-	-
S3)Access Denied	-	-	S1

State Transition Testing of Upload File



State	Valid	Error
S1)Click on Upload File	S2	—
S2)Choose Customer File	S3	S2
S3)Click on Upload Button	S4	S3
S4)File Upload Successfully	—	

State Transition Testing of View Ranking Report



State	Valid
S1)Click on View Report	S2
S2)Report Generate	—

Use Case Testing

Use case testing for login admin account

Main Scenarios	Serial No	Steps
Actors/Users	1	Enter username or Email Enter Password
	2	Validate Username and Password

	3	Allow access to System
Extensions/Expected Result	1a	Invalid Username or Email System shows an error message
	2b	Invalid Password System shows an error message

Use case testing for create account

Main Scenarios	Serial No	Steps
Actors/Users	1	Enter first name, last name, phone, cnic, city, address, username, email and password
	2	Validate All the fields are filled
	3	Record Enter in System
Extensions	1a	Enter Invalid Data like email System shows an error message
	2b	Leave any field blank System shows an error message

Use case testing for create Form

Main Scenarios	Serial No	Steps
Actors/Users	1	Select type and Enter questions and choices
	2	Validate All the fields are filled
	3	Question enter in System
Extensions	1a	Leave any field blank System shows an error message

Use case testing for update account

Main Scenarios	Serial No	Steps
Actors/Users	1	Enter updated first name, last name, phone, cnic, city, address, username, email and password
	2	Validate All the fields are filled

	3	Record Enter in System
Extensions	1a	Enter Invalid Data like email System shows an error message
	2b	Leave any field blank System shows an error message

Use case testing for update Form

Main Scenarios	Serial No	Steps
Actors/Users	1	Select type and update questions and choices
	2	Validate All the fields are filled
	3	Question enter in System
Extensions	1a	Leave any field blank System shows an error message

Use case testing for login Manager Account

Main Scenarios	Serial No	Steps
Actors/Users	1	Enter username or Email Enter Password
	2	Validate Username and Password
	3	Allow access to System
Extensions	1a	Invalid Username or Email System shows an error message
	2b	Invalid Password System shows an error message

Use case testing for login Dealer account

Main Scenarios	Serial No	Steps
Actors/Users	1	Enter username or Email Enter Password
	2	Validate Username and Password
	3	Allow access to System

Extensions	1a	Invalid Username or Email System shows an error message
	2b	Invalid Password System shows an error message

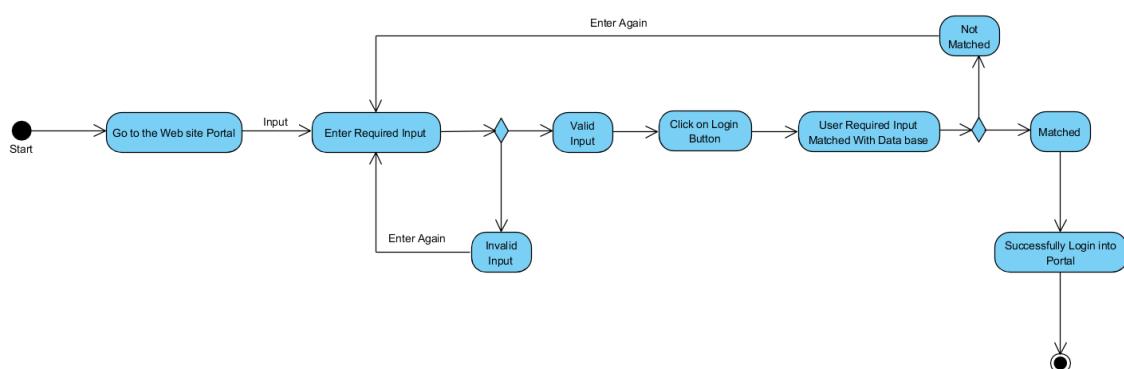
Use case testing for upload file

Main Scenarios	Serial No	Steps
Actors/Users	1	Select file from system
	2	Validate all data in correct format
	3	File uploaded in System
Extensions	1a	Invalid file format System shows an error message
	2b	Leave any field in file System shows an error message

White Box Test Cases

Cyclometric complexity

Login Account



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $14 - 12 + 2 = 4$

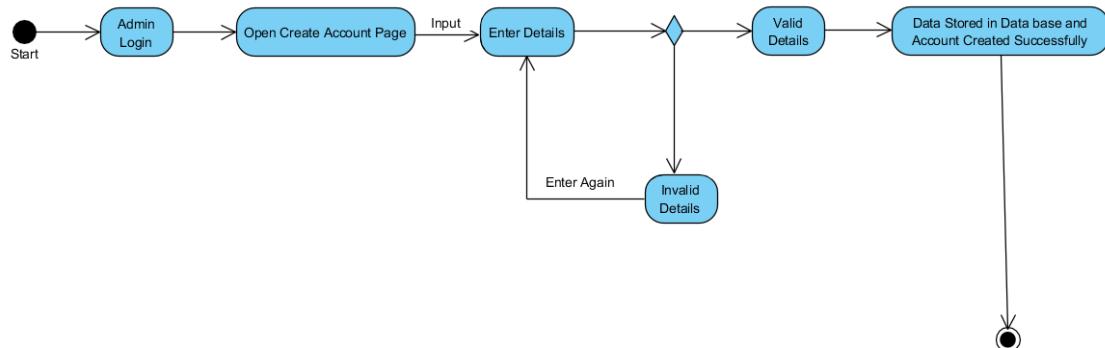
Logout Account



Cyclometric Complexity = number of edges - number of nodes + 2

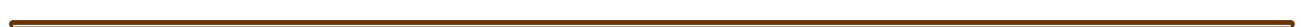
Cyclometric Complexity = $4 - 5 + 2 = 1$

Create Account

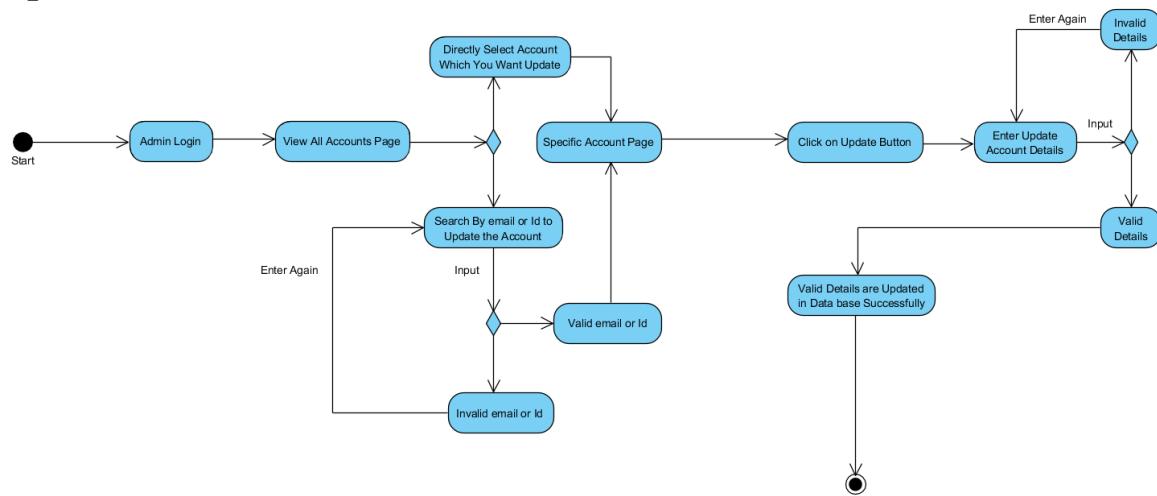


Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $9 - 9 + 2 = 2$



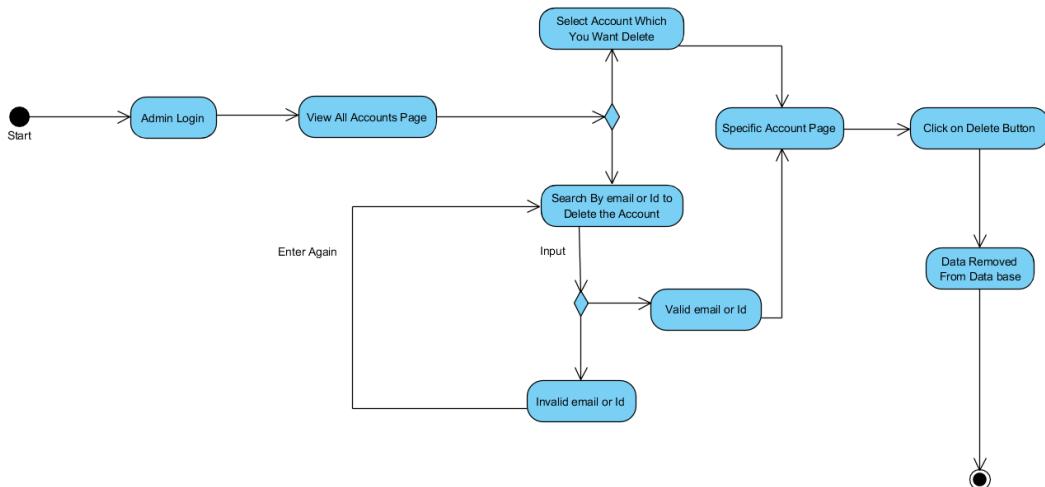
Update Account



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $19 - 17 + 2 = 4$

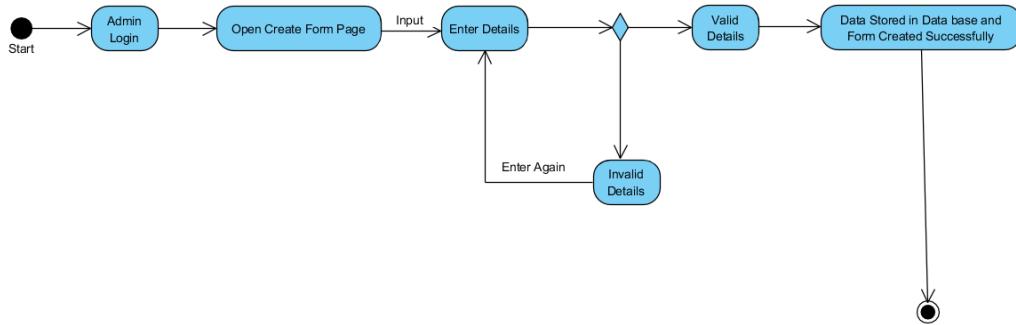
Delete Account



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $14 - 12 + 2 = 4$

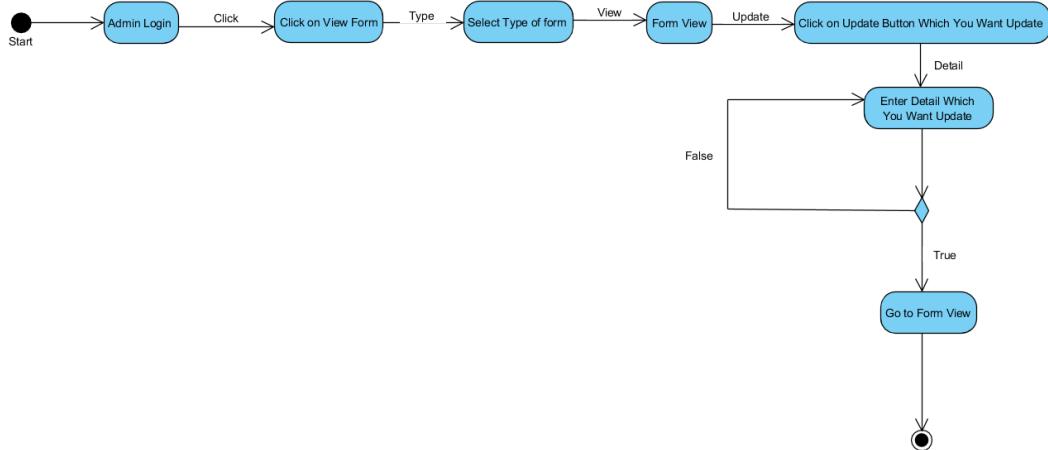
Create Form



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $9 - 9 + 2 = 2$

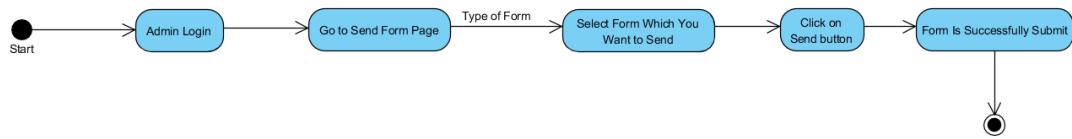
Update Form



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $10 - 10 + 2 = 2$

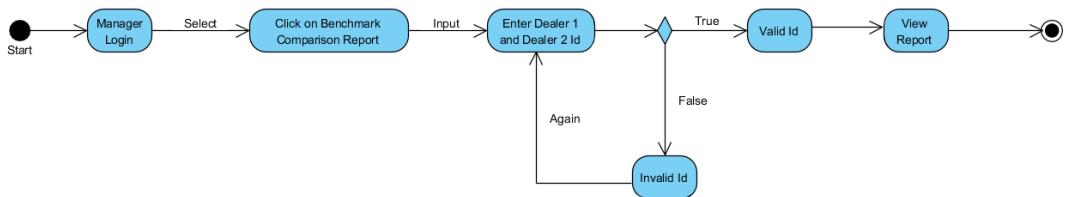
Send Form



Cyclometric Complexity = number of edges - number of nodes + 2

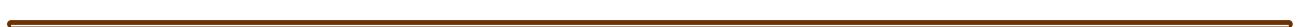
Cyclometric Complexity = $6 - 7 + 2 = 1$

Dashboard Report



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $9 - 9 + 2 = 2$



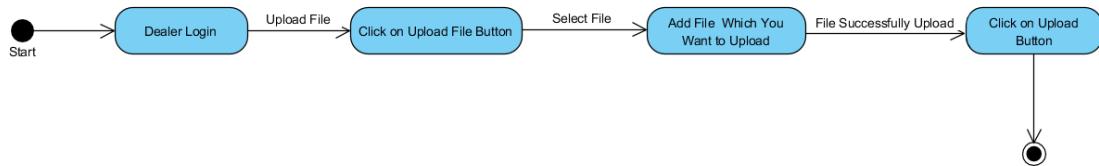
Ranking Report



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $6 - 7 + 2 = 1$

Upload File



Cyclometric Complexity = number of edges - number of nodes + 2

Cyclometric Complexity = $5 - 6 + 2 = 1$

Regression Testing

This testing is done to make sure that new code changes should not have side effects on the existing functionalities. It ensures that the old code still works once the new code changes are done. In our case there is no changes occurred in our project.



Chapter 6: Tools and Techniques



Languages using in the development

Html & CSS

Html & CSS are used in the front end and the front end is done by using html and CSS.

JavaScript

JavaScript is used in the front end to generate charts and reports.

PHP

PHP is used in the back end.

SQL

SQL is used in the database coding.

Application and Tools

Following tools and techniques are used in the project.

- Bootstrap
- Notepad++
- Visual Studio Code

Libraries

The Google Chart API is an interactive Web service that creates graphical charts from user-supplied data. We use google charts library to generate charts and reports by providing the data.

Chapter 7: Summary and Conclusion



Summary

In this section, we provide the conclusion of our project and the challenges we have face through this project.

Throughout the year, we have faces so many challenges that we have never met before. This was our first time that we have to be in charge of the whole project, and this was a yearlong project. It was our first time to deal with programming on web based services. Thanks to God, we have learnt a lot on programing, Bootstrap, PHP, and CSS which was really valuable and beneficial to our final year project. At the beginning, we were new to Web application programming and the Bootstrap and Sessions handling.

Technically, the challenge is how we validate each form for the purpose of proper insertion of data, how to handle sessions of users and admins, how to make a perfect database so data could be easily managed and how we make our website beautiful. Database takes our lots of time to build. As PHP, Bootstrap and are new for us, when we were stuck on some methods, surfing forums and discussion groups would be our best choice. Although that was time consuming, we found it satisfied when the problem was solved.

Conclusion

Personally, we have to be more self-discipline as besides completing our final year project; we have also courses to take in the semesters. Time management was the most precious thing we have learnt throughout this project. What's more, friendship among classmates can be enhanced as we have spent more time together in the university discussing the projects. All in all, the final year project has given us a lot of memorable moments that we will treasure them for our life time.

We make a software product line for the analysis of sales and services provided by the dealership of an automobile maker. The dealers have to provide the customer leads to the automaker. The automaker contacts the customers and give them opportunity to provide feedback either through web based survey or via telephone. The automobile manufacturer then process this data using our system. Our system provides the users of this product data analysis capabilities so that they can monitor the performance of their dealerships in order to improve their sales and services. With this, the industry will grow and the company will enhance their revenue, reputation and quality.

Chapter 8: User Manual



Admin Account:

Login

Admin must have

Email or user name and password.

Web login address.

Steps

Open web page.

Enter email or user name and password.

Select type admin.

Click on login button.

Done.

Welcome to Login

The image shows a simple login interface. At the top center is the word "Login". Below it are two input fields: one for "User Name or Email" and another for "Password". Underneath these fields is a blue rectangular button with the text "Log in" in white. At the bottom of the form, there is a row of two radio buttons with the labels "Admin" and "Manager" next to them.

Logout

To logout admin must have

User name and password.

Web login address.

Steps

Click on logout button from the top of the right hand corner.

Done.



Dashboard

To go to home page admin must have

User name and password

Web login address.

Steps

Click on dashboard from the top of the left hand corner.

Done.



Admin Dashboard

To go to home page admin must have

User name and password

Web login address.

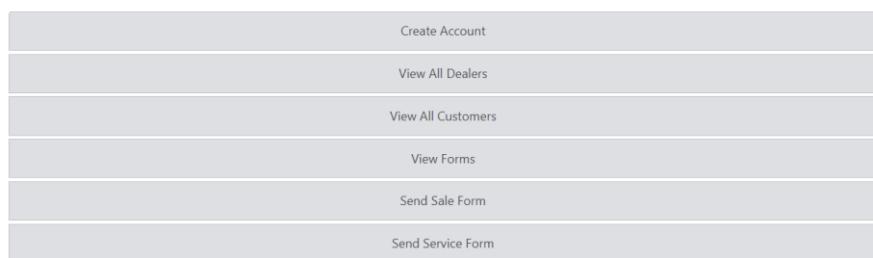
Steps

Login to view admin dashboard

Done.



Dashboard



Create Account

To create account, admin must have



Login credentials.

Web login address

Steps

Click on create account button

Enter the detail of create account

Click on create button

Done

The screenshot shows a 'Create Account' form with the following fields:

- First Name:** Enter First Name
- Last Name:** Enter Last Name
- Phone#:** Format: +923123456789
- CNIC#:** Without Dashes
- City:** Radio buttons for Lahore, Rawalpindi, Multan, and Faisalabad
- Address:** Enter Address
- User Name:** Enter User Name
- Email:** Enter Email
- Password:** Min Length: 5 Max Length: 12

At the bottom right of the form is a blue 'Create' button.

View the detail of all dealers

To view all dealers, admin must have

Login credentials.

Web login address.

Steps

Click on view all dealers button

Select the dealer and click on view detail button

Done

Dealer Detail

ID:	User Name:
5	umar
First Name:	Last Name:
Muhammad	Umar
Phone#:	CNIC#:
923204830069	3520218873765
City:	Area:
Lahore	Tajpura
Email:	Password:
muhammadumar19981@gmail.com	umar
<input type="button" value="Update"/> <input type="button" value="Delete"/>	

Update dealer detail

To update dealers, admin must have

Login credentials.

Web login address.

Steps

Click on view all dealers button

Select the dealer and click on view detail button

Click on update button

Update record

Click on update button

Done

Update Account

User Name	umar
First Name	Muhammad
Last Name	Umar
Phone#	923204830069
CNIC#	3520218873765
City	<input checked="" type="radio"/> Lahore <input type="radio"/> Rawalpindi <input type="radio"/> Multan <input type="radio"/> Faisalabad
Area	Tajpura
Email	mohammadumar19981@gmail.com
Password	***
<input type="button" value="Update"/>	

Delete dealer

To delete dealers, admin must have

Login credentials.

Web login address.

Steps

Click on view all dealers button

Select the dealer and click on view detail button

Click on delete button

Done

Dealer Detail

ID:	User Name:
5	umar
First Name:	Last Name:
Muhammad	Umar
Phone#:	CNIC#:
923204830069	3520218873765
City:	Area:
Lahore	Tajpura
Email:	Password:
mohammadumar19981@gmail.com	umar
<input type="button" value="Update"/> <input type="button" value="Delete"/>	

View detail of all customers

To view all customers' detail, admin must have

Login credentials.

Web login address.

Steps

Click on view all customer button

Select the customer and click on view detail button

Done

Customer Detail

ID:	Customer Name:
1	Adil Islam Butt
Dealer ID:	Dealer Name:
7	adil
Phone#:	Email:
03238839155	adil.butt7861@gmail.com
City:	Address:
Lahore	55D Model Town
Type:	Arriving Date:
sale	11/7/2019

View sale form

To view sale form, admin must have

Login credentials.

Web login address

Steps

Click on view forms button

Click on sale button

Done



Sale Form

How frequently do you purchase from us?	How likely is it that you would recommend us to a friend/colleague?
<input type="radio"/> Every Month <input type="radio"/> Every 5 - 6 Months <input type="radio"/> Every 1 - 2 Years <input type="radio"/> Every 5 - 6 Years <input type="radio"/> Not At All <input type="button" value="Update"/>	<input type="radio"/> Very Likely <input type="radio"/> Somewhat likely <input type="radio"/> Neutral <input type="radio"/> Somewhat Unlikely <input type="radio"/> Very Unlikely <input type="button" value="Update"/>

View service form

To view service form, admin must have

Login credentials.

Web login address

Steps

Click on view forms button

Click on service button

Done

Service Form

How frequently do you service from us?	How likely is it that you would recommend us to a friend/colleague?
<input type="radio"/> Everytime <input type="radio"/> Sometime <input type="radio"/> Every Month <input type="radio"/> Every Years <input type="radio"/> Not At All <input type="button" value="Update"/>	<input type="radio"/> Very Likely <input type="radio"/> Somewhat likely <input type="radio"/> Neutral <input type="radio"/> Somewhat Unlikely <input type="radio"/> Very Unlikely <input type="button" value="Update"/>

Send sale form

To send sale form, admin must have

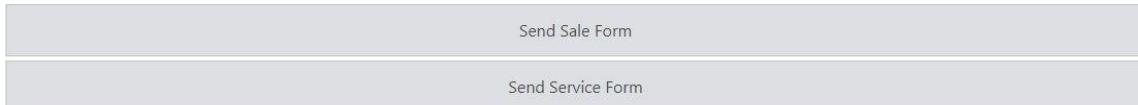
Login credentials.

Web login address

Steps

Click on send sale forms button

Done



Send service form

To send service form, admin must have

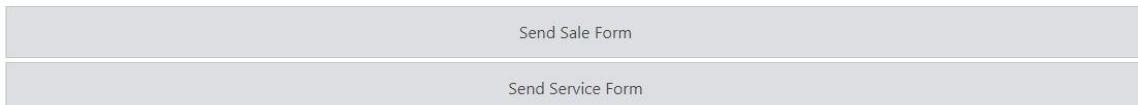
Login credentials.

Web login address

Steps

Click on send service forms button

Done



Manager Account:

Login

Manager must have

Email or user name and password.

Web login address.

Steps

Open web page.

Enter email or user name and password.

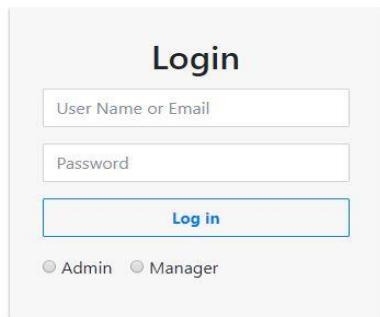
Select type as manager.

Click on login button.

Done.



Welcome to Login



The image shows a login form titled "Login". It contains two input fields: "User Name or Email" and "Password", both with placeholder text. Below these is a blue "Log in" button. At the bottom, there are two radio buttons labeled "Admin" and "Manager".

Logout

To logout manager must have

User name and password.

Web login address.

Steps

Click on logout button from the top of the right hand corner.

Done.



Manager Dashboard

To go to home page manager must have

User name and password

Web login address.

Steps

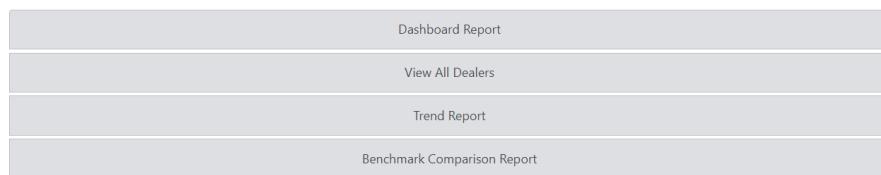
Login to view manager dashboard

Done.





Dashboard



Dashboard

To go to home page manager must have

User name and password

Web login address.

Steps:

Click on dashboard from the top of the left hand corner.

Done.



Dashboard report

To view dashboard report manager must have

User name and password

Web login address.

Steps

Click on dashboard report

Done

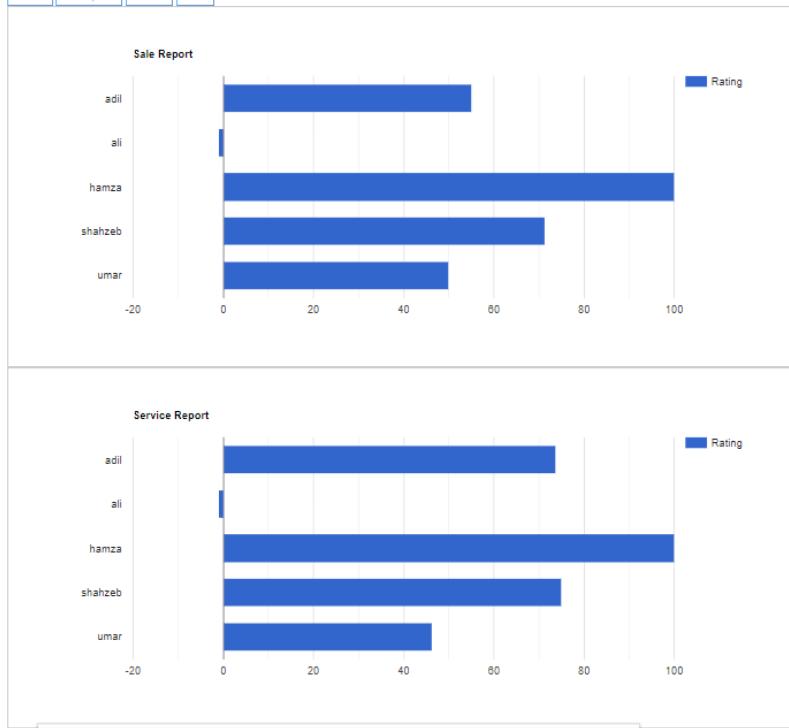


Dashboard Report

Punjab

Select City to Drill Down:

[Lahore](#) [Rawalpindi](#) [Multan](#) [Clear](#)



Trend report

To view trend report manager must have

User name and password

Web login address.

Steps

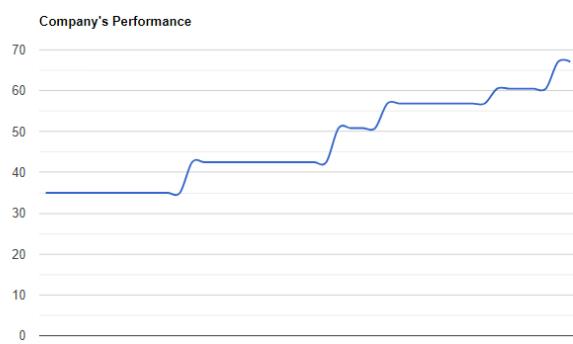
Click on trend report

Done

Trend Report

Month Wise Year Wise

[View Trend](#)



Benchmark comparison report

To view benchmark comparison report manager must have

User name and password

Web login address.

Steps

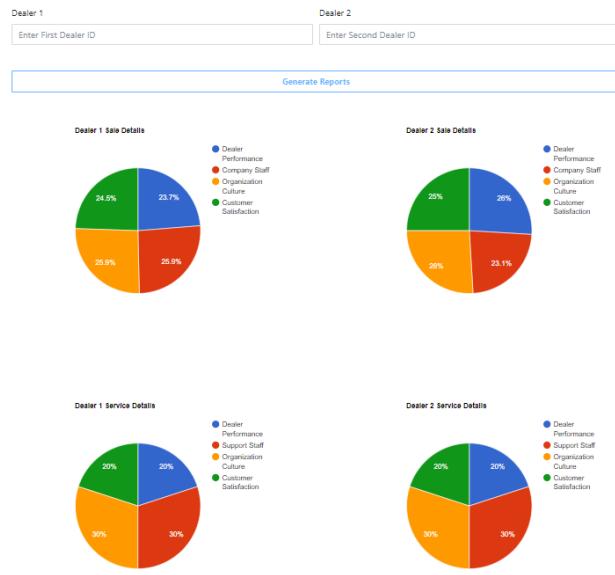
Click on benchmark comparison report

Enter first dealer id and enter second dealer id

Click on generate report

Done

Benchmark Report



View the detail of all dealers

To view all dealers, admin must have

Login credentials.

Web login address.

Steps

Click on view all dealers button

Select the dealer and click on view detail button

Done

Dealer Detail

ID:	User Name:
5	umar
First Name:	Last Name:
Muhammad	Umar
Phone#:	CNIC#:
923204830069	3520218873765
City:	Area:
Lahore	Tajpura
Email:	Password:
muhammadumar19981@gmail.com	umar

Dealer Account:

Login

Dealer must have

Email or user name and password.

Web login address.

Steps

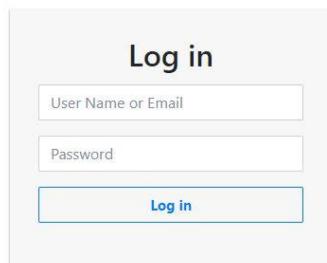
Open web page.

Enter email or user name and password.

Click on login button.

Done.

Welcome to Login



Logout

To logout dealer must have

User name and password.

Web login address.

Steps

Click on logout button from the top of the right hand corner.

Done.



Dashboard

To go to home page dealer must have

User name and password

Web login address.

Steps

Click on dashboard from the top of the left hand corner.

Done.



Dealer Dashboard

To go to home page dealer must have

User name and password

Web login address.

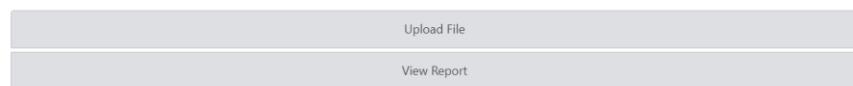
Steps

Login to view dealer dashboard

Done.



Dashboard



Upload file

To upload file dealer must have



User name and password

Web login address.

Steps

Click on upload file button

Choose file

Click on upload

Upload File

Choose File:

No file chosen

View report

To view report dealer must have

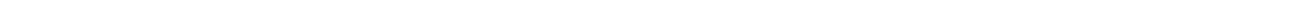
User name and password

Web login address.

Steps

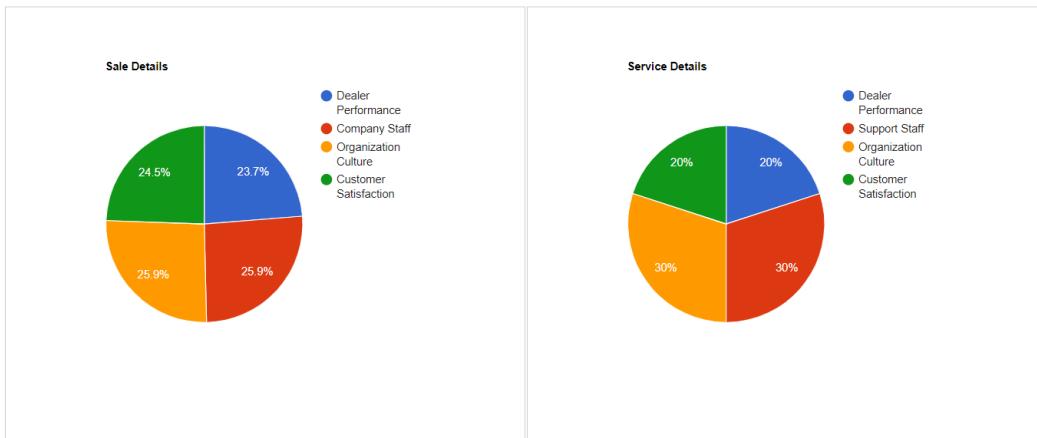
Click on view report button

Done



Dealer Report

shahzeb



Chapter 9: Lessons Learnt



Lessons Learnt

In this project, while making the application we learnt so much. We learnt more about PHP as backend and Html, CSS, JavaScript and MySQL as database.

Languages we learnt:

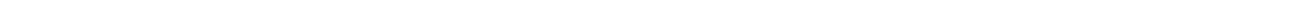
- PHP
- HTML
- CSS
- JavaScript
- SQL

Frameworks we learnt:

- Bootstrap

Tools and techniques we learnt:

- Visual studio code
- Notepad++
- Xampp
- Google charts



Appendix A: Bibliography / References



References

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