Bilkent University

Department of Computer Engineering

CS 319 – Object Oriented Programming

Spring 2015

Section 02

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GalleryMania

Analysis Report

Group 07

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1. Introduction

"GalleryMania" is a vehicle search engine for the user who wants to research or buy different kinds and featured vehicles by looking different galleries on one platform. It is a user friendly desktop application especially who does not know computer usage skills very well. "GalleryMania" provides large wide of vehicle so this application can also function as a car/ motorcycle/ SUV (land vehicle) gallery. Hence, people can search and learn their wonders about vehicles according to applications' clear description about vehicles' features. Details about "GalleryMania" application will be given in the analysis part of the report starting with a case description, requirements analysis that documents what "GalleryMania?" will need to be functional and achieve its goal. Moreover, a section that gives a model of "GalleryMania" application completely with domain analysis, class diagrams, state chart and sequence diagrams. Finally, a conclusion which is a final review of the report with the evaluation and experiences of analysis process will be given.

2. Case Description

Many people wonder cars, motorcycles and land vehicles; however learning their features and prices is troublesome activity for most of us. Vehicle galleries have different locations and there a few kind of vehicles are showing to clients. Clients generally do not want to deal with salespersons who try to sell most expensive vehicle in the gallery rather than selling the most useful vehicle according to clients' needs; thus the application "GalleryMania" give helping hand to clients. This application provides time effective and more clear vehicle searching for clients. Thanks to "GallaryMania" clients returning the computer users and they do not have to go many different galleries in the town, they just search any cars, motorcycles and SUVs as

they want by using the application.In the application many galleries will exist as different brand names. These galleries will sell their brand's products, vehicles, to user. Users can analyse the vehicles features easily. As an example, cars have many subcategories such as hybrid cars, sports cars, classic cars, and family cars. This subcategories have also other subcategories which gives information about cars equipments like motor features. This kind of subcategories existing for all kind of vehicle types in the application. If the user likes the vehicle and wants to buy it they can use the application sales panel. The application main purpose getting easy researching vehicles for user; that is why it will organize as user friendly which means that user interface will be ease of use for everybody's benefit.

3. Requirement Analysis

3.1 Functional Requirements

1. Customer should be able to search for a specific vehicle.
2. Customer should be able to sign in to the GalleryMania.
3. Customer should be able to sign up to the GalleryMania.
4. Customer should be able to sell a vehicle to a gallery.
5. Customer should be able to sign in to the app.
6. User should be able to specify some restrictions for a vehicle.
7. Gallery owner can add cars to the gallery owner.
8. Gallery owner should be able to sign up to the GalleryMania.
9. Gallery owner should be able to sign in to the GalleryMania.

3.2 Non-functional Requirements

1. Each gallery can have at most 100 vehicles.
2. Each SUV should have a diesel engine.
3. Each gallery can have up to 10 vehicle of the same type and same name.

4. System has 1GB total storage.
5. There can be only one gallery for one vehicle brand.

3.3 Constraints

1. The program implements with java.
2. The language of the program is English.

3.4 Scenarios

Scenario 1)

Scenario Name	logInFirstTimeSucccess
Participating Actor Instances	batuhan: Customer

Flow of events

1. Batuhan loges in the GalleryMania and chooses the “Sign Up” function to create a new account.
2. GalleryMania pops up the “Sign Up” form.
3. Batuhan chooses the “Customer” user type to create account and fills all the required information about himself.
4. Batuhan completes the form, he creates the account.
5. GalleryMania pops up a screen warning that the creation is completed.
6. GalleryMania takes Batuhan back to the main screen.

Scenario 2)

Scenario Name	logInFirstTimeFail
Participating Actor Instances	eyüpcan: GalleryOwner

Flow of events

1. Eyüpcan logins GalleryMania and chooses the “Sign Up” function to create a new account.
2. GalleryMania pops up the “Sign Up” form.
3. Eyüpcan chooses the “GalleryOwner” user type to create account but he does not fill all the required information about himself..
4. Eyüpcan tries to create his incomplete account.
5. GalleryMania pops up a screen warning that the creation is not completed and asks Eyüpcan to complete his form.

Scenario 3)

Scenario Name	sellVehicleWhenStockFull
Participating Actor Instances	nilay: Customer

Flow of events

1. Nilay chooses the “Sign in” button in GalleryMania and she signs in with her existing account.
2. Nilay selects a gallery with vehicle’s specifications.
3. Nilay offers her vehicle to sell.
4. GaleriMania checks whether stock is full or not in gallery for her specified vehicle.

5. After checking, program found that stock is full.
6. System rejects her offer with warning message.
7. Nilay could not sell her car to this gallery.

Scenario 4)

Scenario Name	sellVehicleWhenStockNotFull
Participating Actor Instances	metin: Customer

Flow of events

1. Metin chooses the "Sign in" button in GalleryMania and she signs in with his existing account.
2. Metin selects a gallery with his vehicle's specifications.
3. Metin offers his vehicle to sell this gallery.
4. GaleriMania checks whether stock is full or not in gallery for his specified vehicle.
5. After checking, program found that stock is not full.
6. System accepts his offer and it increases stock of gallery.
7. Metin sold his car to this gallery.

Scenario 5)

Scenario Name	buyVehicleWhenStockAvailable
Participating Actor Instances	ceren: Customer

Flow of events

1. Ceren chooses the "Sign in" button in GalleryMania and she signs in with her existing account.

2. Ceren selects a gallery with vehicle's specifications.
3. System shows the vehicle that fits to the specifications with its stock.
4. Ceren decides to buy the vehicle.
5. System shows the deal screen.
6. Ceren accepts the deal conditions and buys the vehicle.

Scenario 6)

Scenario Name	buyVehicleWhenStockNotAvailable
Participating Actor Instances	kaan: Customer

Flow of events

1. Kaan chooses the "Sign in" button in GalleryMania and she signs in with his existing account.
2. Kaan selects a gallery with his vehicle's specifications.
3. System shows the vehicle that fits to the specifications with its stock.
4. Kaan tries to buy the vehicle.
6. System rejects him with warning message which explains stock is not available.
7. Kaan could not buy the car from this gallery.

Scenario 7)

Scenario Name	addVehicleToInventorySuccess
Participating Actor Instances	fatih: Gallery owner

Flow of events

1. Fatih signs into the system with its account.
2. Fatih goes to the add vehicle screen and selects the vehicle specifications.
3. Fatih completes the vehicle specifications and clicks add button.
4. System checks the slot for a new car and finds a slot for it.
5. System adds the new car to the gallery inventory.

Scenario 8)

Scenario Name	addVehicleToInventoryFailed
Participating Actor Instances	ömer: Gallery owner

Flow of events

1. Ömer signs into the system with its account.
2. Ömer goes to the add vehicle screen and selects the vehicle specifications.
3. Ömer completes the vehicle specifications and clicks add button.
4. System checks the slot for a new car and can not find a slot for it since the stock is full for that car.
5. System does not add the new car to the inventory and gives a warning to the Ömer that stock for that car is full.

3.5 Use-Case Models

3.5.1 Visual Use Case

The Customer actor communicates with SignUp, SignIn, ChooseGallery, BuyVehicle and SellVehicle use cases. The GalleryOwner actor communicates with SignIn, SignUp and OpenGalleryInventory use cases.

SignUp use case includes SignUpCustomer and SignUpGallery use cases. SignIn use case includes SignInCustomer and SignInGallery use cases.ChooseGallery use case extends

OpenGalleryInventory use case and OpenGallerInventory use case includes BuyVehicle, SellVehicle and ChangeInventory use cases.

Customer opens the GalleryMania, He/she first communicates with SignInCustomer use case or if he/she does not have an existing Customer account, Customer will communicate with SignUpCustomer use case to create a new one. After siging in, Customer will communicate with ChooseGallery use case and then proceed with extending OpenGalleryInventory use case to communicate with BuyVehicle or SellVehicle use cases, according to Customer operation wishes.

GalleryOwner opens the GalleryMania, He/she first communicates with SignInGallery use case or if he/she does not have an existing GalleryOwner account, GalleryOwner will communicate with SignUpGallery use case to create a new one. After signing in, GalleryOwner will communicate with OpenGalleryInventory use case to proceed with ChangeInventory use case to set stocks and capacities.

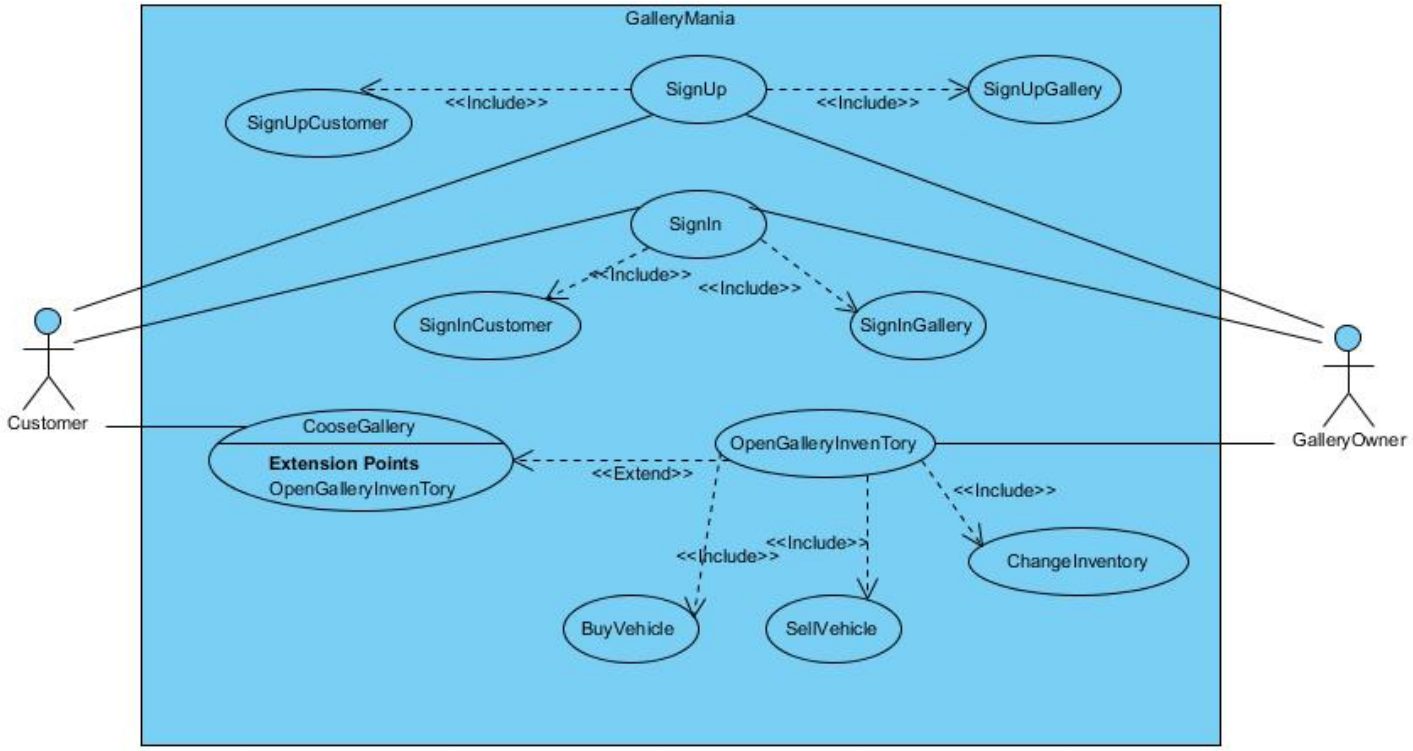

Figure 3.5.2.1 Use Case Diagram

3.5.2 Textual Use Case

Use Case 1)

Use case Name	SignUpCustomer
Participating Actors	Initiated by Customer

Flow of events

1. Customer logins GalleryMania and chooses the “Sign Up” function to create a new account.
2. GalleryMania responds by presenting “Sign Up” form to the screen.
3. Customer chooses the “Customer” user type to create account and fills all the required information about himself, in the form. He uses “Complete Form” function to create his account.
4. GalleryMania receives Customer’s form application and confirms his apply. It pops up a screen warning that the creation is completed.

Entry Conditions	Customer logged into GalleryMania
Exit Conditions	Customer has received an acknowledgement from the GalleryMania indicating that the he has created his account.
Exceptions	Customer has received an acknowledgement from the GalleryMania indicating that the he couldn’t create his account.

Use Case 2)

Use case Name	SignUpGallery
Participating Actors	Initiated by GalleryOwner

Flow of events

1. GalleryOwnerlogins GalleryMania and chooses the “Sign Up” function to create a new account.
2. GalleryMania responds by presenting “Sign Up” form to the screen.
3. GalleryOwnerchooses the “GalleryOwner” user type to create account and fills all the required information about himself, in the form. He uses “Complete Form” function to create his account.
4. GalleryMania receives GalleryOwner’s form application and confirms his apply. It pops up a screen warning that the creation is completed.

Entry Conditions	GalleryOwnerlogged into GalleryMania
Exit Conditions	GalleryOwner has received an acknowledgement from the GalleryMania indicating that the he created his account.
Exceptions	GalleryOwner has received an acknowledgement from the GalleryMania indicating that the he couldn’t create his account.

Use Case 3)

Use case Name	SignInGallery

Participating Actors	Initiated by GalleryOwner

Flow of events

1. GalleryOwner logs in to the GalleryMania and chooses the “Sign In” function to use his existing account.
2. GalleryMania acknowledges the user type and presents GalleryOwner page

Entry Conditions	GalleryOwner logged into GalleryMania
Exit Conditions	GalleryOwner has reached GalleryOwner’s page.
Exceptions	GalleryOwner has received an acknowledgement from the GalleryMania indicating why he couldn’t open his account.

Use Case 4)

Use case Name	SignInCustomer
Participating Actors	Initiated by Customer

Flow of events

1. Customerlogs in to the GalleryMania and chooses the “Sign In” function to use his existing account.
2. GalleryMania acknowledges the user type and presents Customer page

Entry Conditions	Customer logged into GalleryMania

Exit Conditions	Customer has reached Customer's page.

Exceptions	Customer has received an acknowledgement from the GalleryMania indicating why he couldn't open his account.

Use Case 5)

Use case Name	buyVehicle

Participating Actors	Initiated by Customer

Flow of events

1. Customer logs in to the GalleryMania and chooses the "Sign In" function to use his existing account.
2. GalleryMania acknowledges the user type and presents Customer page
3. Customer selects a gallery and selects vehicle's specifications from the gallery.
4. GalleryMania shows the vehicles that fits to the specifications with its stock.
5. Customer decides to buy the vehicle.
6. GalleryMania shows the deal screen.
7. Customer accepts the deal conditions and buys the vehicle if stock is available.

Entry Conditions	Customer logged into GalleryMania

Exit Conditions	Customer has reached Customer's page.

Exceptions

1. Customer has received an acknowledgement from the GalleryMania indicating why he couldn't open his account.

2. Customer could not buy the vehicle if the stock is empty and get warning via the system.

Use Case 6)

Use case Name	sellVehicle
Participating Actors	Initiated by Customer

Flow of events

1. Customer logs in to the GalleryMania and chooses the “Sign In” function to use his existing account.
2. GalleryMania acknowledges the user type and presents Customer page
3. Customer selects a gallery according to his vehicle brand and will give specifications about his vehicle.
4. Customer will offer his vehicle to sell gallery with “sell” button.
5. GaleryMania will check stock depending on vehicle type in the gallery.
6. GaleryMania accepts customer’s offer and stock will be increased.

Entry Conditions	Customer logged into GalleryMania
Exit Conditions	1. Customer has reached Customer’s page. 2. Customer logs out from his account.
Exceptions	1. Customer has received an acknowledgement from the GalleryMania indicating why he couldn’t open his account.

2. After checking process, if stock is full, GaleryMania will give warning message.

Use Case 7)

Use case Name	addVehicleToInventory
Participating Actors	Initiated by Gallery Owner
Flow of events	1. Gallery owner signs into the system with its account. 2. Gallery owner goes to the add vehicle screen and selects the vehicle specifications. 3. Galery owner completes the vehicle specifications and clicks add button. 4. System checks the slot for a new car and finds a slot for it . 5. System adds the new car to the inventory.
Entry conditions	Gallery owner logged into the GalleryMania and clicked to the add vehicle page.
Exit Conditions	1. Gallery owner added the vehicle. 2. Gallery owner logged out of the system. 3. Gallery owner closed down the application. 4. Gallery owner changed his mind and go back to the main page.
Exceptions	1. Gallery owner has received an acknowledgement from the

GalleryMania indicating why he couldn't open his account.

2. Gallery owner could not add the vehicle since the stock is full.

3.6 User Interface

1) Main

The First Interface the user interacts, where he can sign in with his/her existing user name and password or sign up to create a new account.

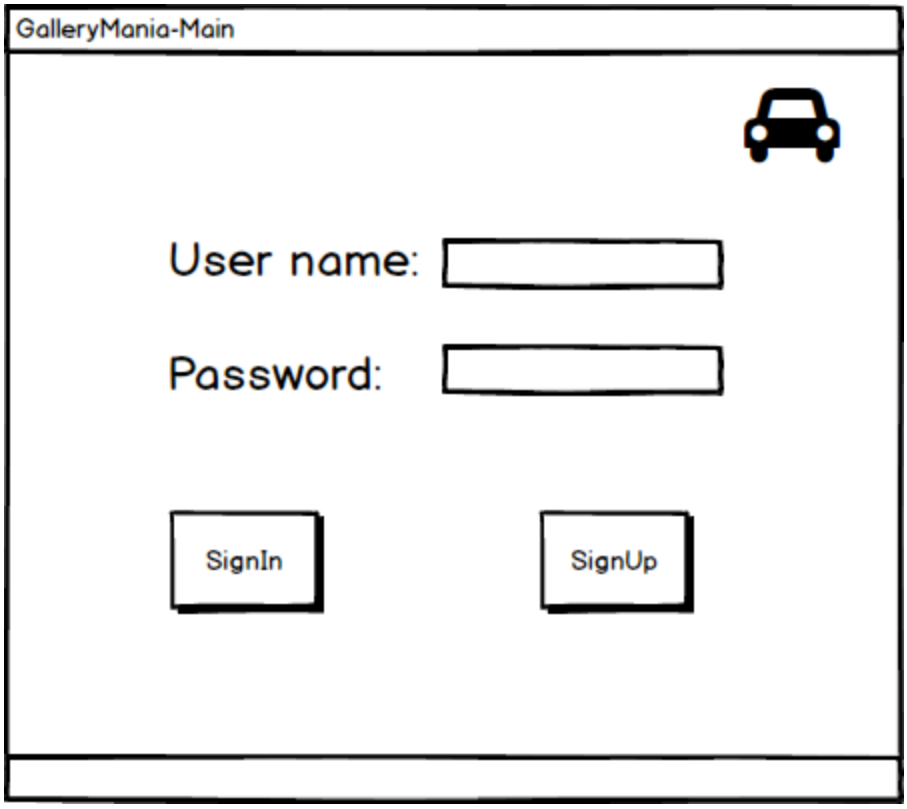

Figure 3.6.1 GalleryMania Main Window

2) Sign Up

User gives his/her information also chooses a username and a password for the new account. User can choose creating either a GalleryOwner account or a Customer account. In the case of createing a GalleryOwner account, the user specifies a GalleryName for his/her gallery.

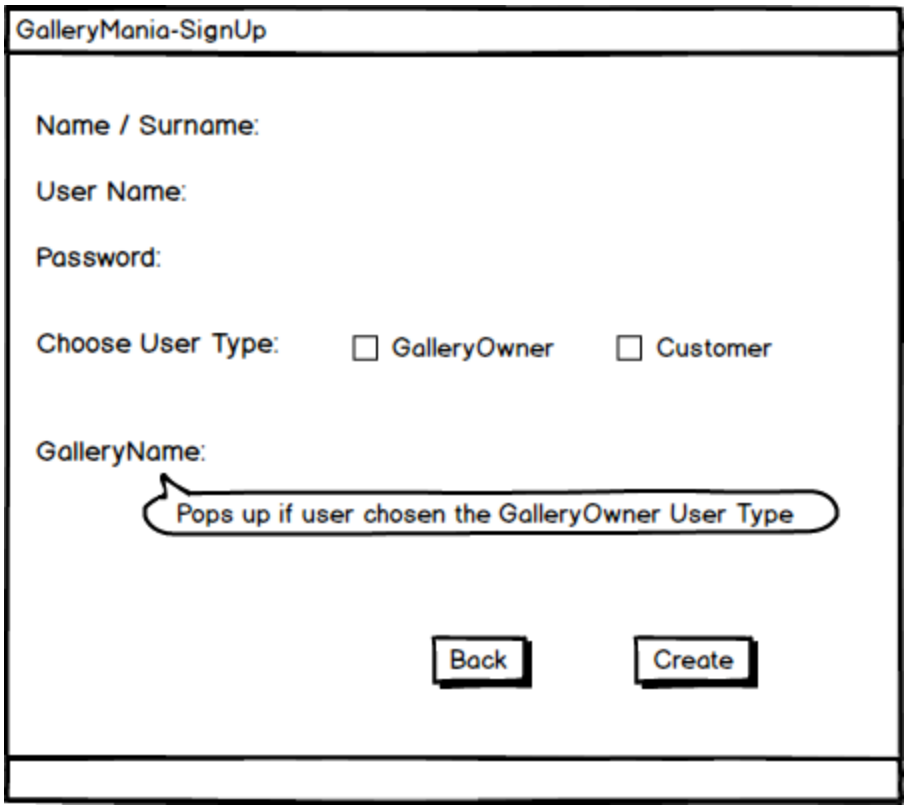

Figure 3.6.2 GalleryMania Sign Up Panel

3) Sign In Customer

This is the interface of Customer when he/she is signed in to the system. This page gives the information of the Customer, his/her name,surname and Username. He/she can choose a gallery to proceed his buying or selling operations by openning the GalleryInventory.

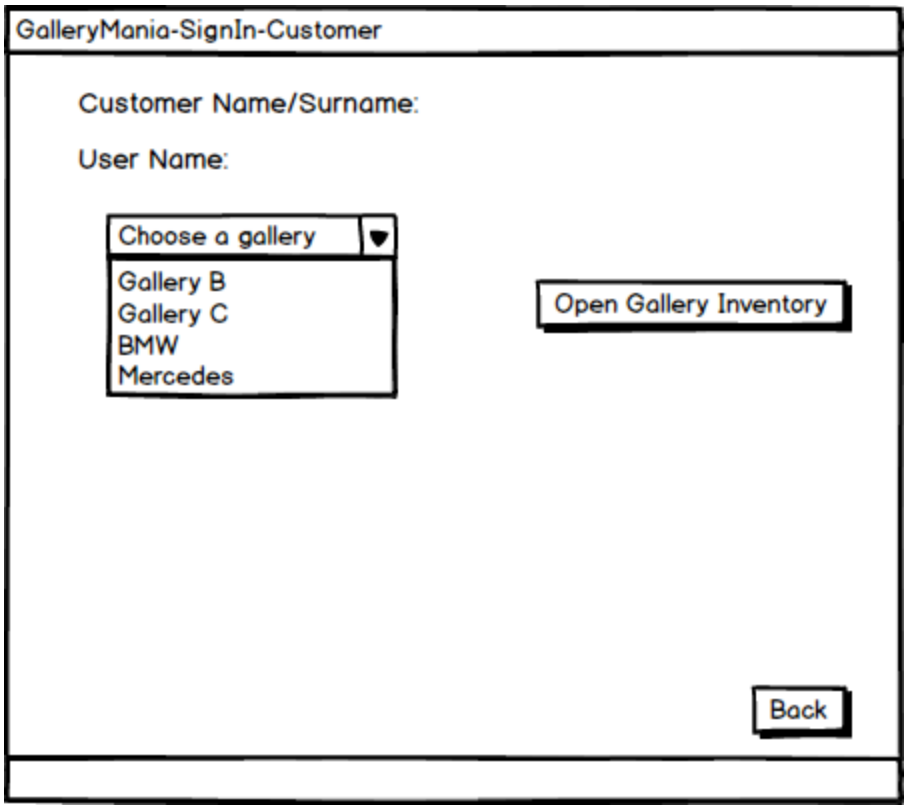

Figure 3.6.3 GalleryMania SignIn Page for Customer

4) Sign In Gallery Owner

This is the interface which the GalleryOwner interacts when he/she is signed in to the system. The page gives the information of the GalleryOwner Name/Surname also, User Name and also Gallery Name. To proceed stock operations, GalleryOwner can proceed to see Gallery Inventory.

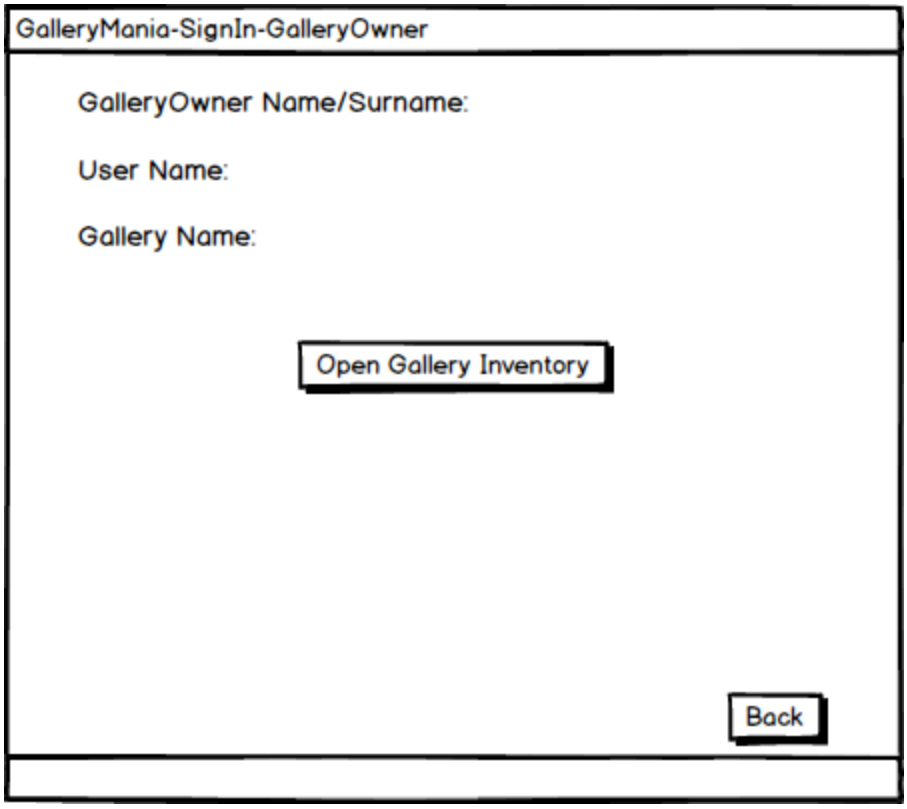

Figure 3.6.4 GalleryMania SignIn Page for Gallery Owner

5) Gallery Inventory

Gallery inventory is a interface for both customers and the gallery owners to achieve different purpose. According to the customer, it enables to buy and sell activities. Otherwise, it set and update stock properties.This window shows the selected vehicle's features which are engine type, engine volume and so on. After selection features search button gets the proper vehicles and user can show its price and stock situation. If the user is customer, s/he can use the left side of the panel to buy or sell the vehicle. If the gallery owner is the user, s/he can use the right side of the panel and s/he can also update the vehicle's stock quantity.

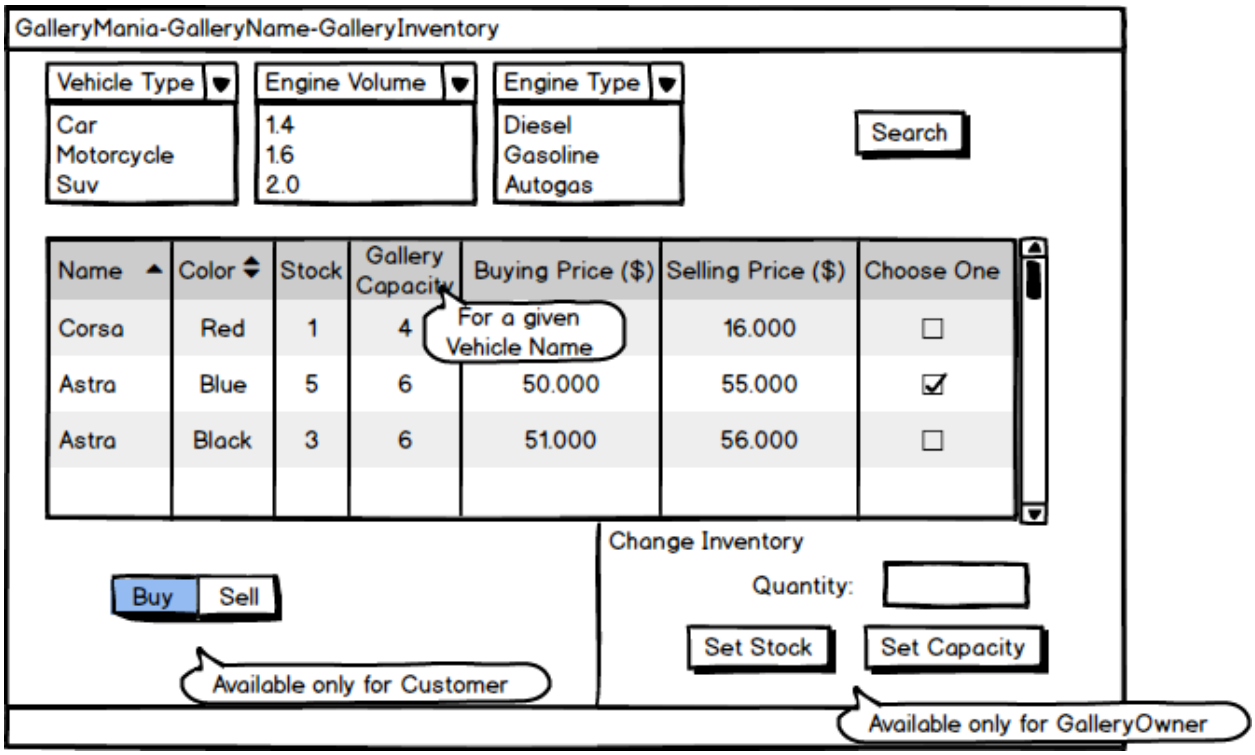

Figure 3.6.5 GalleryMania Gallery Inventory Page

6) Buy Screen

When the customer decides to buy the selected vehicle this screen shows up. This user interface main purpose is negotiating with the gallery owner to buy the selected vehicle. For this reason selected gallery's phone number information is gived to user.

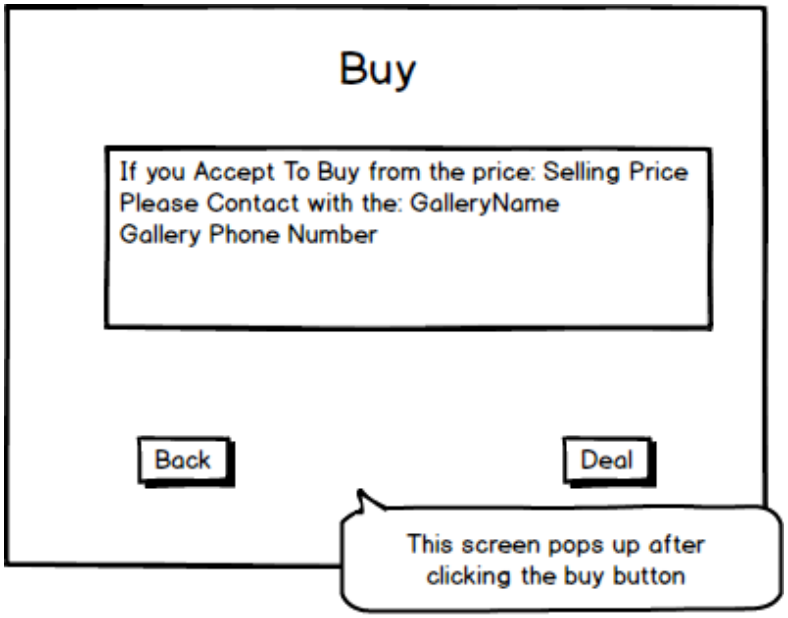

Figure 3.6.6 GalleryMania Buy Screen

7) Sell Screen

When the customer decides to sell the customer's own vehicle this screen shows up. This user interface main purpose is negotiating with the gallery owner to sell the vehicle. For this reason selected gallery's phone number information is gived to user.

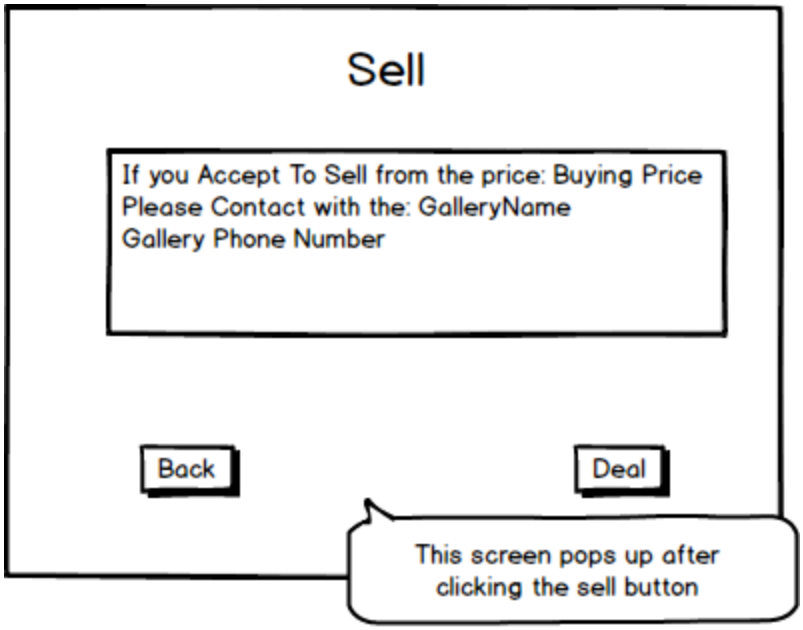

Figure 3.6.7 GalleryMania Sell Screen

4. Analysis Models

4.1 Object Models

4.1.1 Domain Lexicon

User: Person who interacts with the system to search, sell, buy or view vehicles. User has 2 subcategories which are gallery owner and the customer. All users have to sign up and sign in.

Gallery Owner: Person who interacts with the system and has the authority to update stock of the vehicles.

Customer: Person who interacts with the system and can buy, sell or search vehicles.

Sign up: An action for users to interact with the system. All users sign up the system for having an account.

Sign in: An action for users to interact with the system. All users sign in the system to buy, sell, search activities. To sign in system needs to entering the password.

Password: A set of alpha numeric characters the user enters to claim rights to log in.

Vehicle: A thing used for transporting people or goods, especially on land.

Car: A road vehicle, typically with four wheels, powered by an internal-combustion engine and able to carry a small number of people.

Motorcycle: A two-wheeled vehicle that is powered by a motor and has no pedals.

SUV: Sport utility vehicle.

Search: A function that searches a vehicle that the user is looking for. A search can be done by selected features according to the user wishes.

Engine volume: It is related to the bore and stroke of an engine's cylinders. The bore is the diameter of the circular chambers cut into the cylinder block.

Engine type: Vehicle's engine working mechanisim's name such as gasoline, diesel.

GUI: The interface the admin and user uses to interact with the application. It uses the standard WIMP format.

Panel: A pop up that opens a new window for the user to interact with.

4.1.2 Class Diagram:

Project is the class that connects the Model, View and Control of GalleryMania. UserInterface is the main class for the View of GalleryMania. GalleryOwner allows update to the lists from the application to add or remove vehicles according to selling and buying situations. Gallery X means that many gallery exists in the system and their names shows as X variable. For example Gallery X could represent Toyoto or Opel auto dealerships. Galleries consists of vehicles which will have type of cars, motorcycles and SUVs. These vehicles has some attributes which gives information about the features of the specific type of vehicles and methods to handling buying/selling activity. Vehicle class is an abstract class so it include abstract method “checkAvailability()” which checks the quota for selling/buying activities success. All vehicles has engine thus Engine class exist which has information about the engine as its attributes.

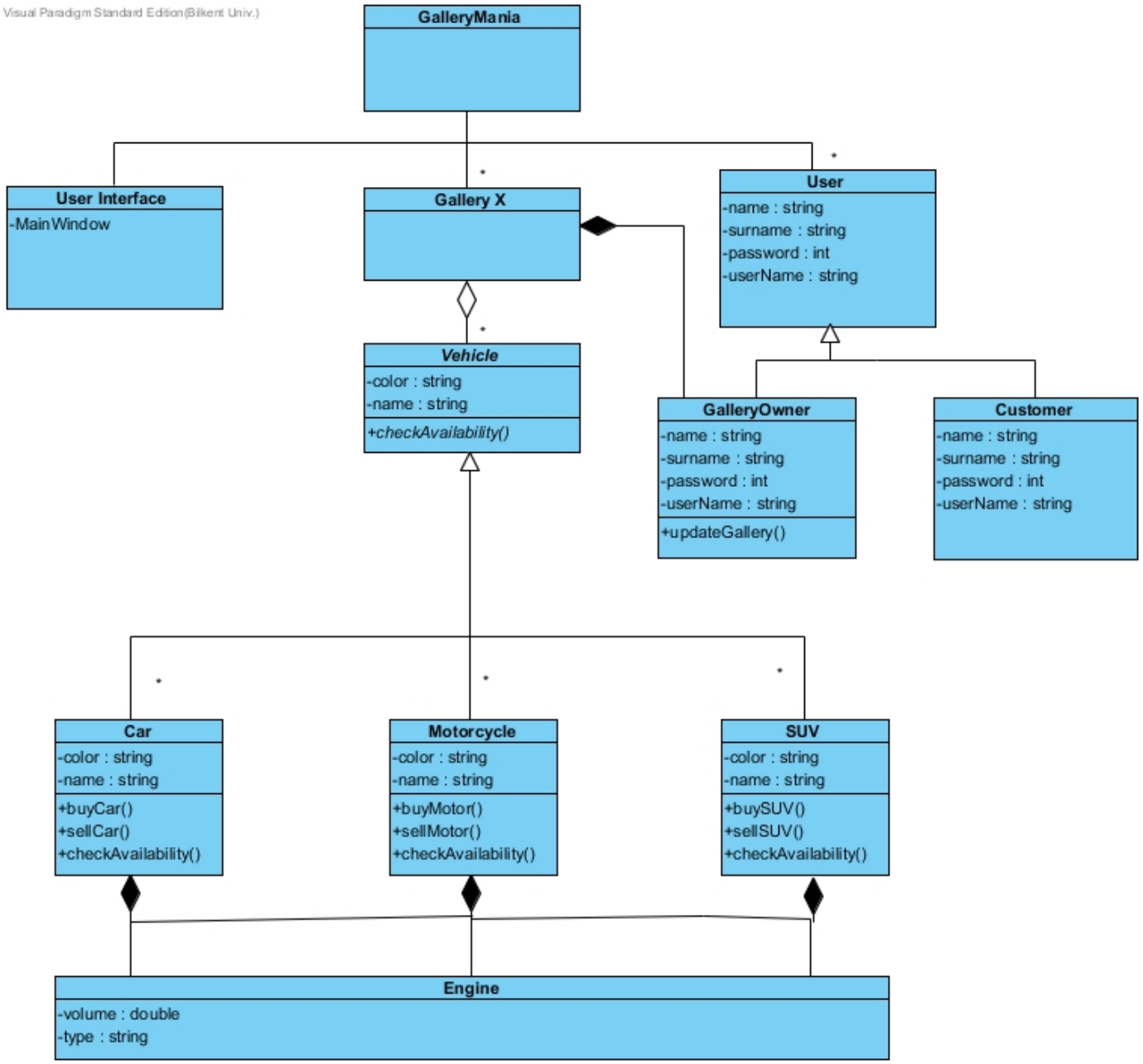

Figure 4.1.2.1 Class Diagram

4.2 Dynamic Models

4.2.1 State Chart Diagrams

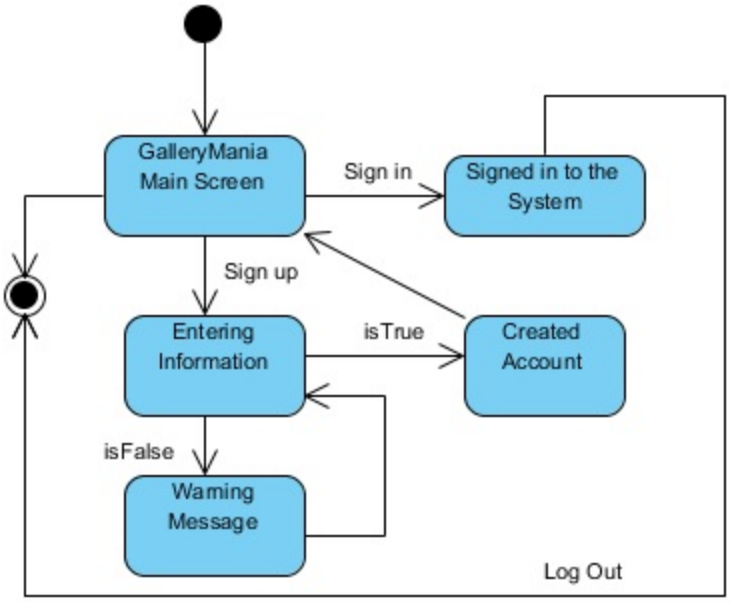

Figure 4.2.1.1: State Chart Diagram for Gallery Owner and Customer to Login

In this state chart diagram, both gallery owner and customer login to the system. If they have an account in GalleryMania, they can directly sign in to the system. If they have not, with providing necessary information of themselves they can easily login to the GalleryMania. When their information has missing part, GalleryMania will warn gallery owner or customer with a warning message and program will enable them to complete their missing information in order to login to the GalleryMania.

After this process, gallery owner or customer can have an account in GalleryMania and they can signin whenever they want. Also, if they want to exit from the GallerMania, they might log out which is defined as final state.

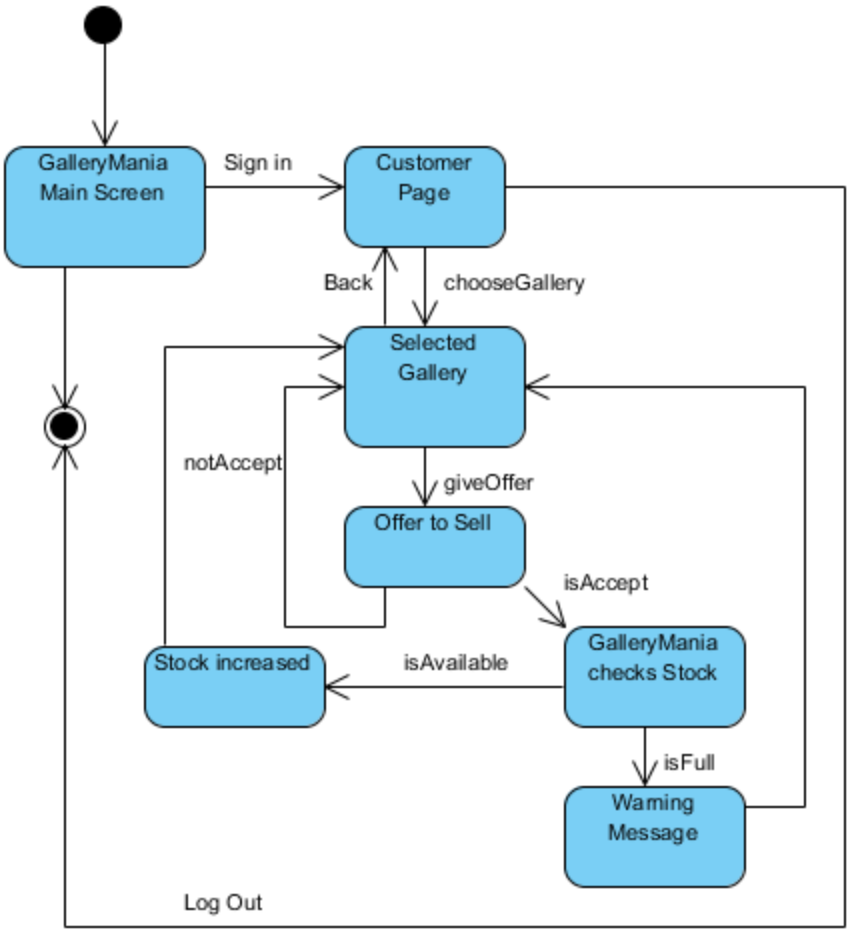

Figure 4.2.1.2: State Chart Diagram for Customer to Sell Vehicle

State chart diagram for selling vehicle indicates that if customer want to sell his/her vehicle, it is possible with offering this vehicle to gallery owners in GalleryMania. After signin in to GalleryMania, Customer can choose a Gallery with considering his/her vehicle type and he/she may give an offer to this gallery with specifying vehicle's properties. After giving an offer, if the gallery accepts it, program checks stock whether it is available or not. If stock is available for this vehicle, stock will be increased so which means that vehicle is sold to the gallery. But if stock is full, customer will have a warning message about it.

In different situation, if the gallery does not accept offer, customer will be directed to Gallery page for giving him/her an opportunity to choose a new gallery.

After all of them, customer can log out from the GalleryMania if he/she wants to close the program.

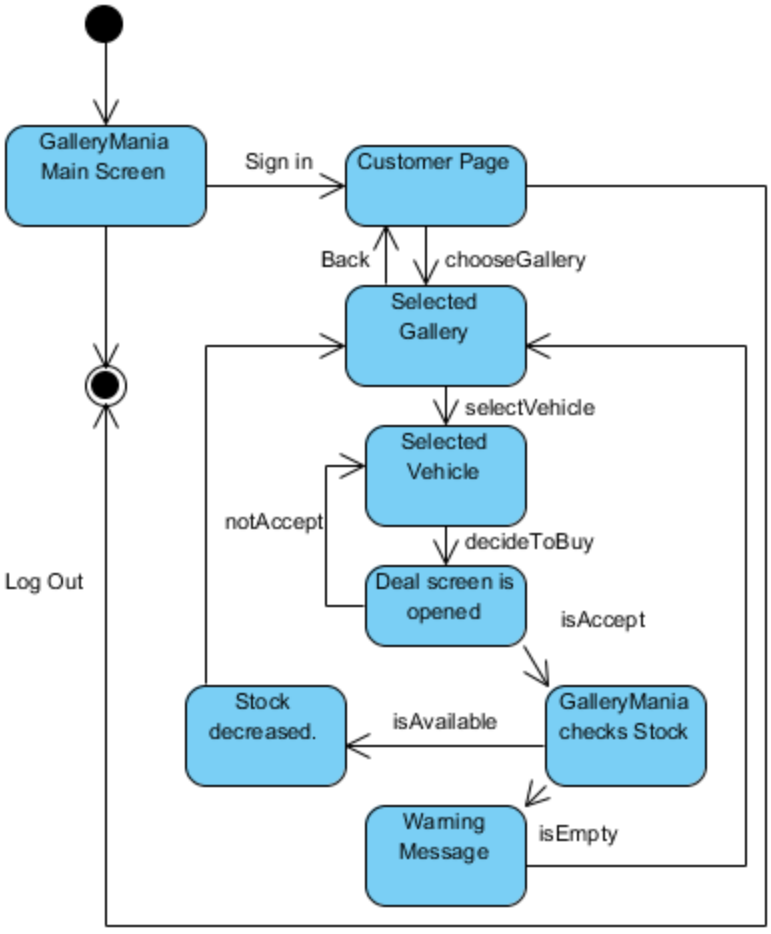

Figure 4.2.1.3: State Chart Diagram for Customer to Buy Vehicle

In this state chart diagram, after signing in to the GalleryMania, customer can buy a vehicle. Firstly, he/she needs to choose a gallery and a vehicle from this gallery. If customer decides to buy this vehicle, deal screen will be opened for selling. When customer accepts the deal which is given by the gallery, GalleryMania checks availability of stock for this vehicle. If stock is available, gallery completes selling process with decreasing stock. However, if stock is

empty, program gives a warning message to warn customer and customer turns to gallery screen again. Considering the other case that if customer does not accept the deal to buy a vehicle, Vehicle Select page opens for customer to search a different vehicle. After them, customer may log out from the GalleryMania.

4.2.2 Sequence Diagrams

In figure 4.2.2.1, the customer signs up for the GalleryMaina application. First he/she clicks to the sign up button then decides his/her username, name, surname and proceeds. Then system connects to database and adds the customer who has suitable username. At the end the program returns back to the main screen.

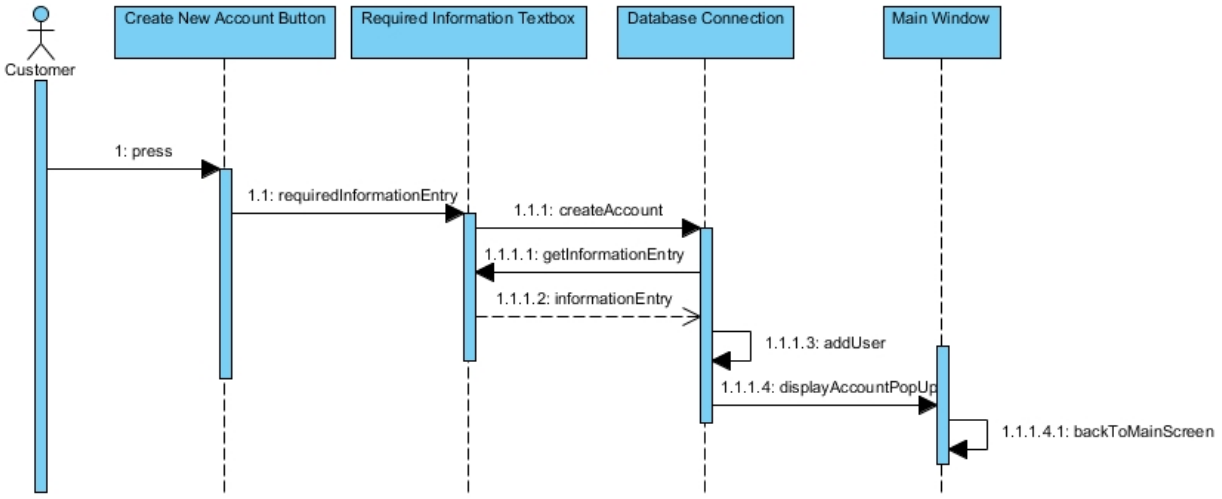

Figure 4.2.2.1 Sequence Diagram for Customer to Sign Up

In figure 4.2.2.2, the gallery owner signs up for the GalleryMaina application. First he/she clicks to the sign up button then decides his/her username, name, surname and proceeds. After that he/she chooses a suitable gallery for himself/herself. Then system connects to database and adds the gallery owner who has suitable username and gallery. At the end the program returns back to the main screen.

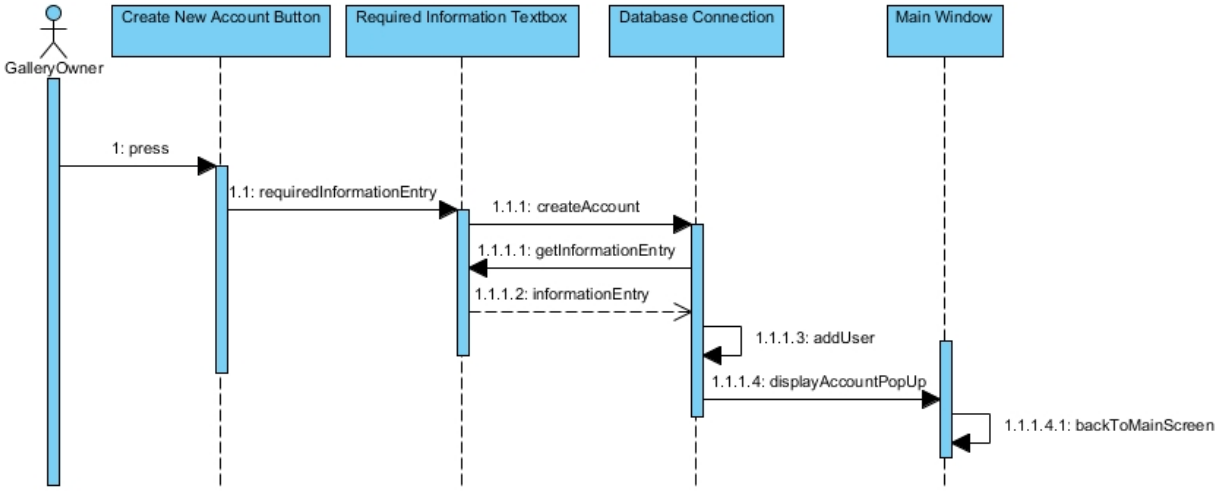

Figure 4.2.2.2 Sequence Diagram for Gallery Owner to Sign Up

In figure 4.2.2.3, customer signs in to the GalleryMaina. He/she fills the necessary information which is username and password then clicks sign in button. System connects to database to find a match and after finding suitable match signs in to the system. Then the sign in screen for customer appears.

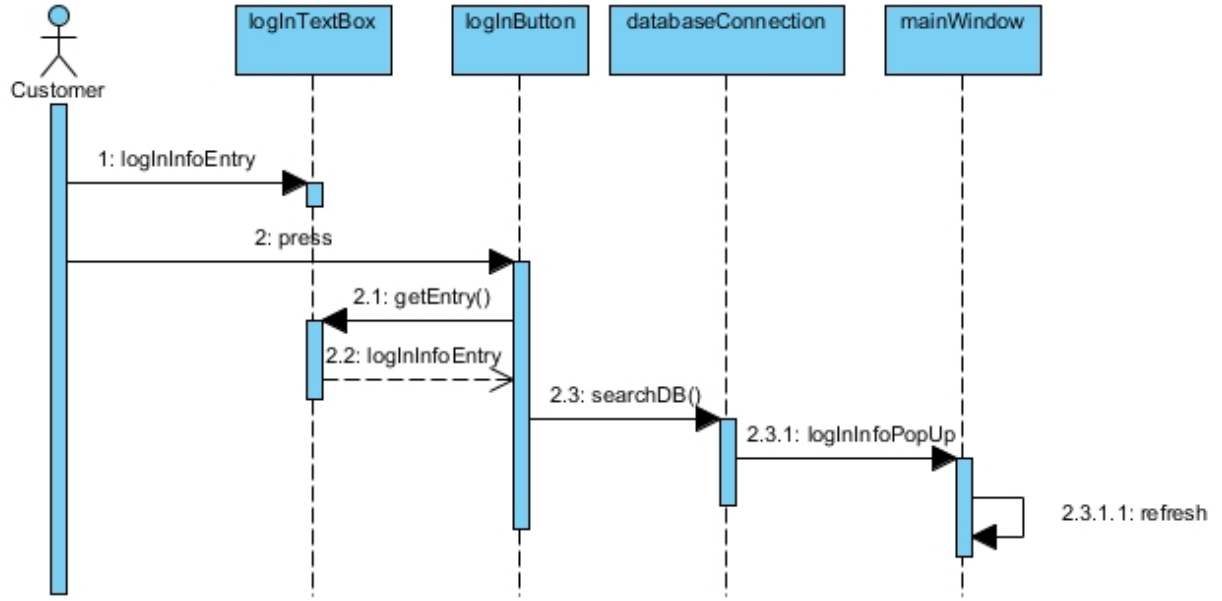

Figure 4.2.2.3 Sequence Diagram for Customer to Sign In

In figure 4.2.2.4, gallery owner signs in to the GalleryMaina. He/she fills the necessary information which is username and password then clicks sign in button. System connects to database to find a match and after finding suitable match signs in to the system. Then the sign in screen for gallery owner appears appears.

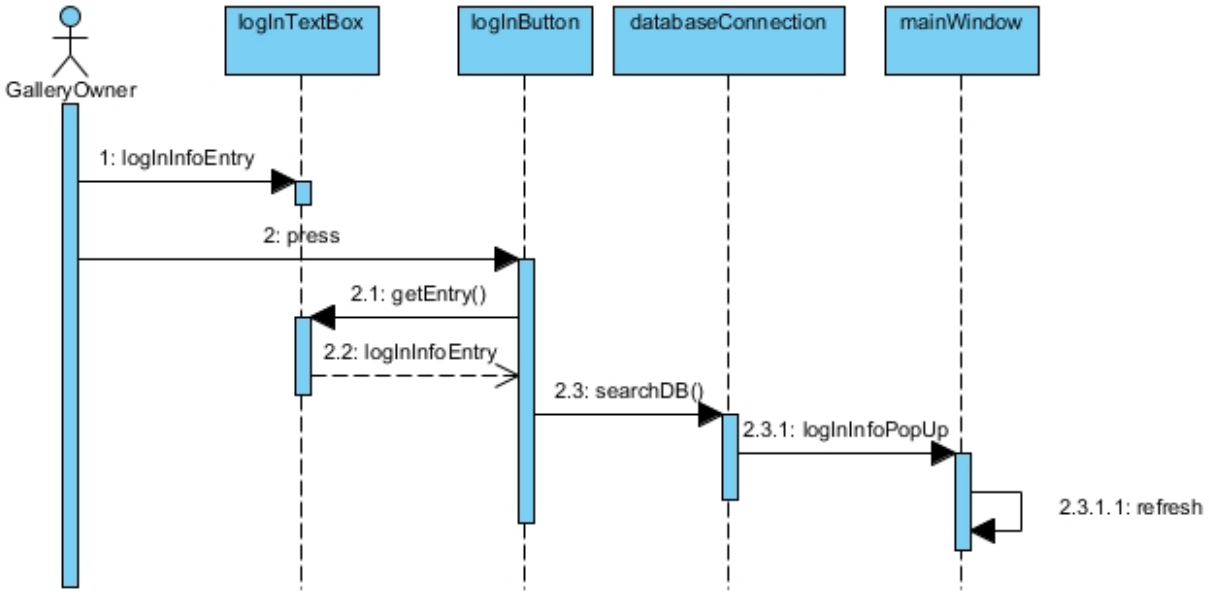

Figure 4.2.2.4 Sequence Diagram for Gallery Owner to Sign In

In figure 4.2.2.5, customer decides to buy a vehicle and selects a vehicle gallery to start his/her purchase. Then he/she enters vehicle specifications and starts his/her search by clicking search button. Then system connects to the database and lists the suitable vehicles according to the specifications of the customer. Customer decides to buy one particular vehicle and selects it then clicks buy button. After that customer accepts the deal and database is updated after the sale.

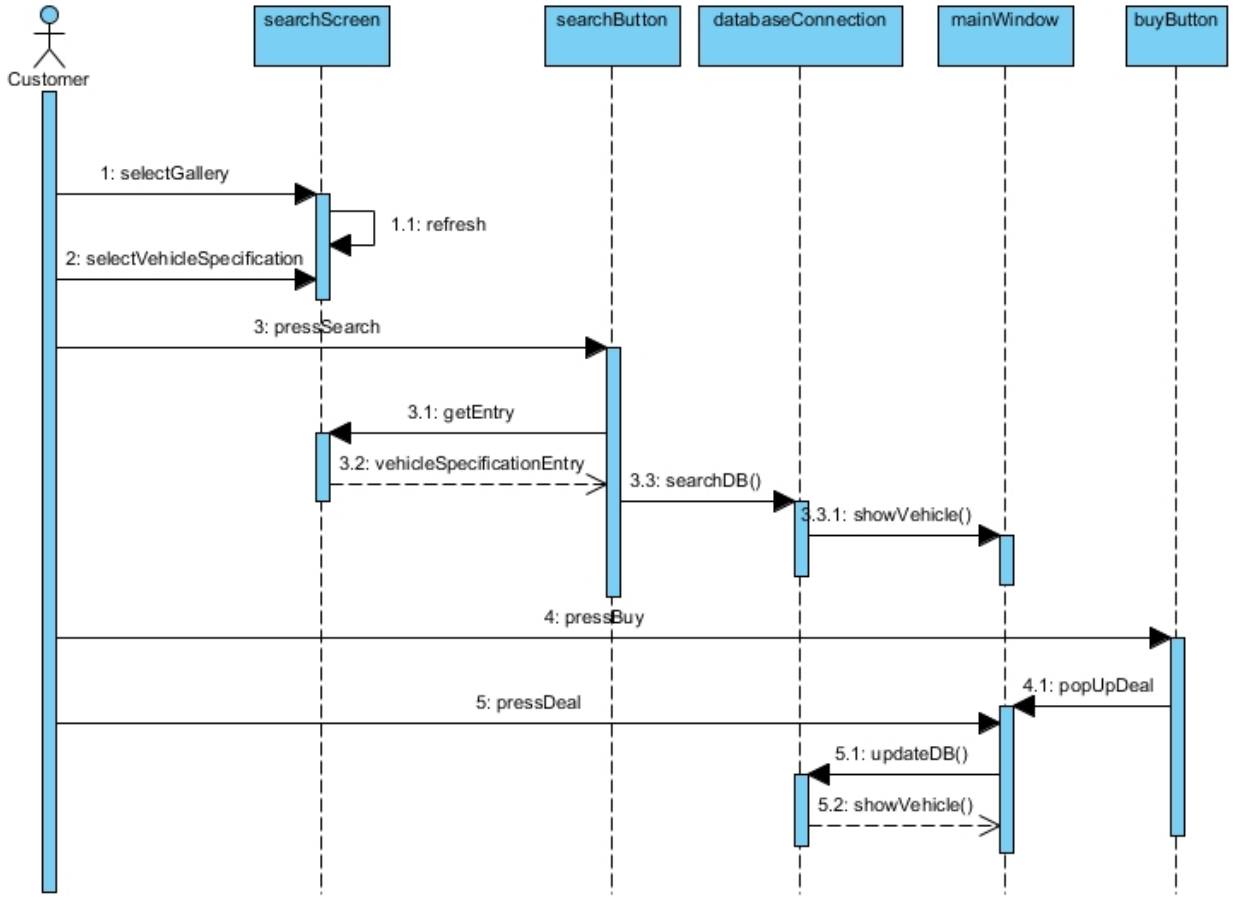

Figure 4.2.2.5 Sequence Diagram for Customer to Buy a Vehicle

In figure 4.2.2.6, customer decides to sell a vehicle and selects a vehicle gallery to start his/her trade. Then he/she enters vehicle specifications and starts his/her search by clicking search button. Then system connects to the database and lists the suitable vehicles according to the specifications of the customer. Customer decides to sell one of his/her vehicle and selects it then clicks sell button. After that customer accepts the deal and database is updated after the sale.

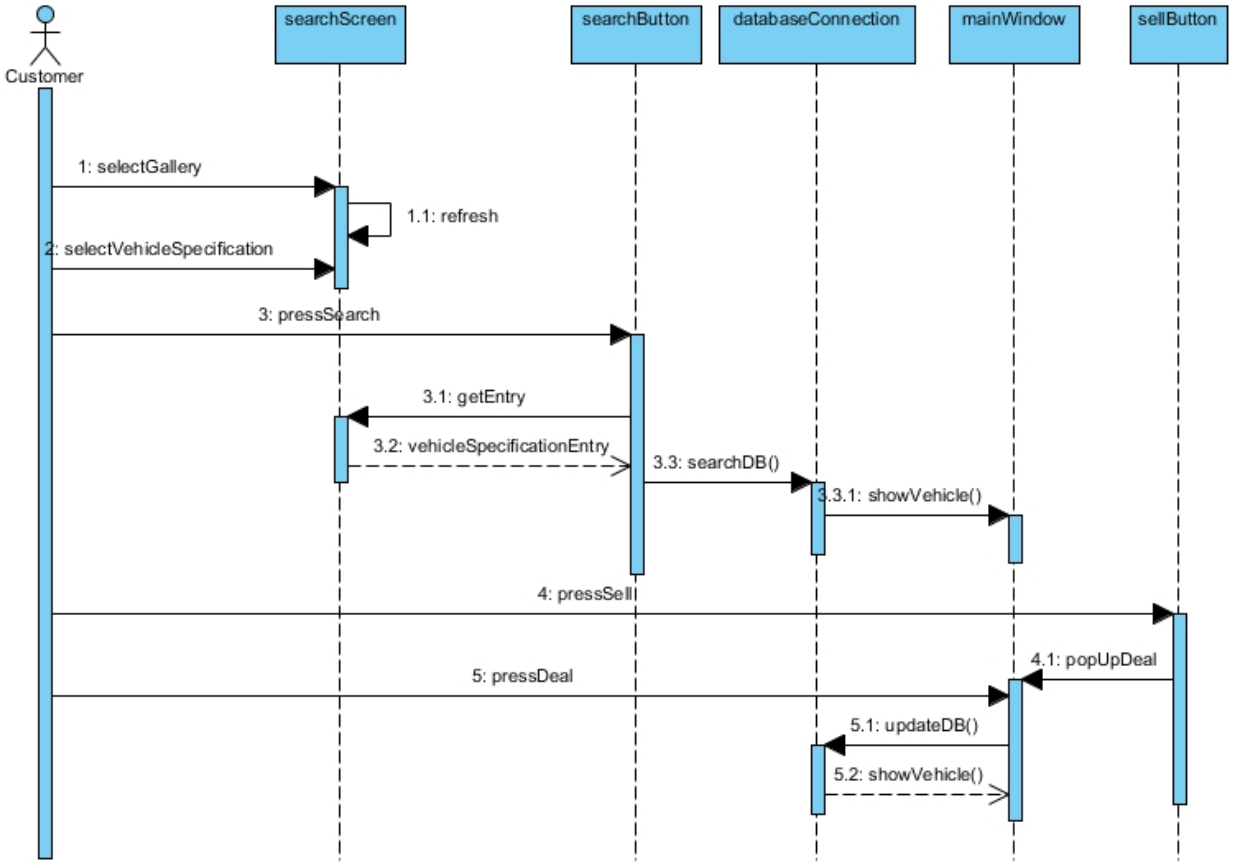

Figure 4.2.2.6 Sequence Diagram for Customer to Sell a Vehicle

In figure 4.2.2.7, gallery owner decides to add a new vehicle to his/her inventory. Gallery owner clicks to the addVehicleToInventory button and addVehicle screen appears. Gallery owner sets the vehicle specifications and clicks addVehicle button. Then system connects to database and checks whether car is suitable for adding or not. Then the vehicle is added to the database and database is updated accordingly. Then a pop up window appears including the information about the process and then the program returns back to the main screen of gallery owner.

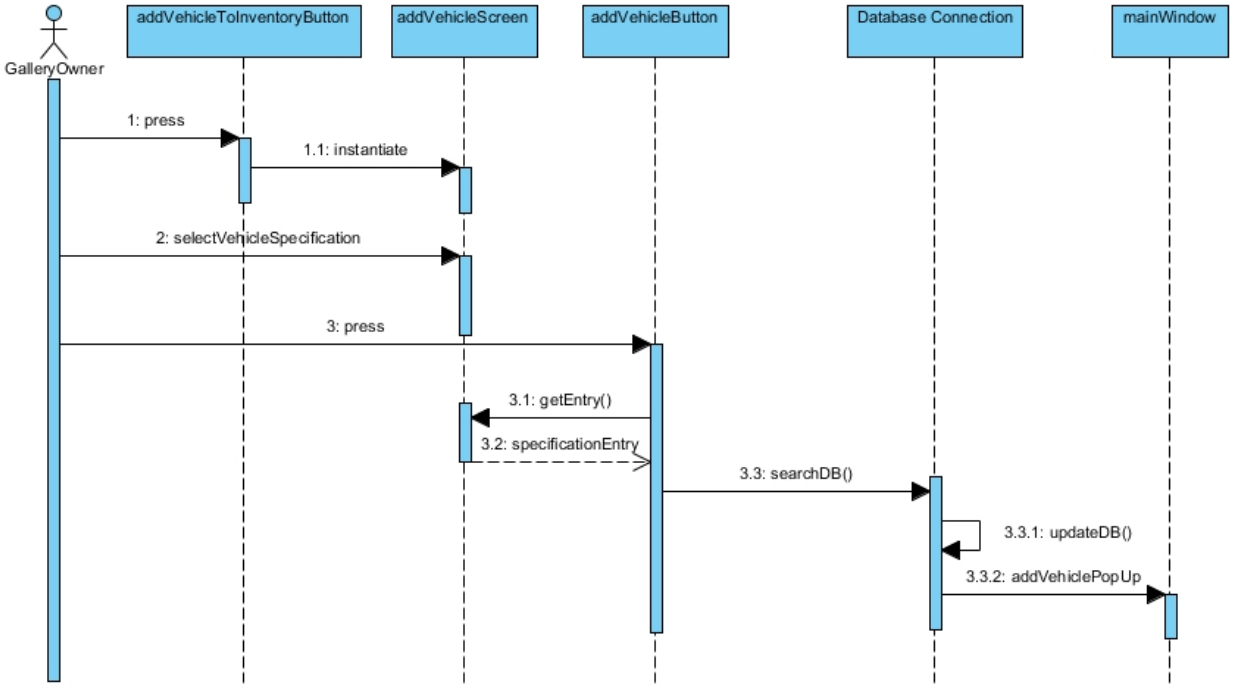

Figure 4.2.2.7 Sequence Diagram for Gallery Owner to add Vehicle in Inventory

4. Conclusion

In this report, we create our analysis report of the project, called "GalleryMania". Our analysis report consists of two main parts: requirement specification and system model. In our project design, we care to include all these functional and nonfunctional requirements. Requirement specification helps us to move on system model part. After deciding the requirements, it was not so difficult to System model consists of the following: use case diagram, dynamic model (sequential diagrams and state diagrams), class diagram and userinterface. While deciding the use cases, we specified the actions from the requirements. We tried to show possible actions, interactions and errors and modeled the system model. Scenarios were very useful while shaping this models.Our state diagrams indicates "GalleryMania" basically. We spent more time when we needed to change or add anything to the class diagram. Other diagrams are shaped according to the class user interface includes main window, sign up window, sign in for both customer and the gallery owner, and the

gallery inventory according to the selected brand name.We tried to keep user interface mock-up simpler as much as we can, because we plan to have a user friendly interface.

In conclusion, we learned about project development cycle, and how it can be done as a team, the importance of documentation, trading some design goals for a better design. In addition, the foremost thing was that we realized the importance of communication between the group members.