Vehicle Monitoring System

American International University- Bangladesh (AIUB)
Department of Computer Science

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Project: Vehicle Monitoring System

Submitted to

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Course: SOFTWARE REQUIREMENT ENGINEERING

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1. Introduction

1.1 Purpose –

Road accidents in Bangladesh have reached epidemic levels, with newspaper headlines reporting casualties on a daily basis. Road safety is on of greatest issue of our country. Our system can prevent the problem.

1.2 Document Convention –

text format: times new roman; font size :11;

1.3 Project Scope –

The scope of this project is to study and design the system will cover a vehicles lifetime track record. When a customer goes to buy a car or motorbike s/he can make sure that the product is authentic and till now all kinds of taxes have been paid. vehicle is using parking in wrong way it can notify the authority and the driver also.

1.4 References –

1. https://bsp.brta.gov.bd/vehicleRegistration;jsessionid=BAF090C12A2271425BD3CD96C78559E6.server4?lan=en**l**

2. https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database

2. Overall Description

2.1 Productive perspective –

Objective: First automate the vehicle selling and its enlistment to BRTA. Who is purchasing the vehicle checking if that individual is qualified to purchase the vehicle. Purchaser must show driving permit. At that point while the vehicle is running out and about continually checking if its obeying with the traffic rules or not. With advanced tag digital license plate and some other equipment our system will be able check the vehicle progressively. Along these lines our streets will be increasingly sheltered. At that point system will also monitor its parking records.

2.2 User classes and characteristics –

User Class	Characteristics
Vehicle Seller	To ensure all of his vehicles are listed on govt. list and when selling vehicle seller must show buyer that all the paper for vehicle are genuine .
Vehicle Owner	To checking vehicle status
BRTA officer	To get notification about vehicle on road and tax information.
Parking manager	To check vehicles parking status.

2.3 Operating Environment –

This is going to be a web based system and will be accessible from Mac os or Windows. For Windows version should be windows 7 or higher. This system for BRTA so this is only for Bangladesh.

2.4 Design and implementation constraints –

To design this system there's some option in languages. Like for database PHP can be used and for designing HTML, CSS can be used. Also Python is a good option.

3. System Features

3.1 Description of feature –

First automate the vehicle selling and its enlistment to BRTA. Who is purchasing the vehicle checking if that individual is qualified to purchase the vehicle. Purchaser must show driving permit. At that point while the vehicle is running out and about continually checking if its obeying with the traffic rules or not. With advanced tag digital license plate and some other equipment our system will be able check the vehicle progressively. Along these lines our streets will be increasingly sheltered. At that point system will also monitor its parking records.

3.2 Functional requirements –

Functional Requirements Description
the system will check if the car is available
the system will show different types of engine
the system will check if the buyer is eligible to purchase a car
if the buyer is eligible then when checking out the buyer will ask for buyer's credit card information
buyer's will enter his information to the system
the system will check for if the amount is available is buyer's account
if everything is correct then the system will let user buy car
The system shall verify the driving license and determine to which kind of user it corresponds, i.e. valid, privileged, car owner or invalid.
The system shall allow to start up the car only if the driving license of a valid user has been inserted in the slot
If there is an attempt to start up the car, the system shall explicitly ask for a valid driving license if no driving license has been inserted in the slot.
The system shall inform the user whether the inserted driving license is invalid or corresponds to an invalid user
Once the car has been started up, the driving license can be removed at any time
If the car is turned off and a driving license is in the slot, the system should inform the user that a driving license remains in the slot
The system only allows Bangladeshi driving licenses to be registered as valid.

In order for a privileged user to add or remove valid users, the driving license of the privileged user should remain inserted in the slot during the whole procedure.
In order for the car owner to manage any kind of user, the driving license of the car owner should remain inserted in the slot during the whole procedure.
The system shall copy the newly added user's license chip information to the car's user database.
In order to add a valid or privileged user to the system, the driving license of the user to be added is needed
System shall be able to detect accurate speed of a vehicle using speed metre and
System shall be able to detect if vehicle is maintaining signals using intelligent traffic monitoring algorithm
System shall be able to detect if vehicle is going through right route using motion detector and direction
System shall be able to Scan number plate using digital number plate reader
System shall be able to Take photograph of driver using CCTV camera
System shall be able to Send notification to associated Operator if any kind of rule is broken
System shall be able to Add fine to vehicle owner profile
System shall be able to Disable vehicle road permit if owner breaks rule numbers of time
the customer able to enter any parking area with digital number plate associated with system
Gates and blockers shall be integrated with smart identification technologies.
The customer shall be able to use parking management system which is integrated with Access control systems like Automatic gates, barrier controls, ticketing systems.
The parking management shall be able to regulate & monitor the parking facility requirements, designed to manage the car parking slots & provide useful reports and information to the developer
The access control shall be implemented with both open-end credit readers and biometric readers and similarly the surveillance are often upgraded
The Ticketing System shall be programed to the clients parking policies and integrated with the ticketing dispenser machines and Payment systems.
Security of vehicle shall be easy with CCTV and trackable number plates.

3.3 User Stories (user requirements) –

Application	Use case
Private Vehicle Monitoring System	1. Can login 2. Can update Profile 3. Tax 4. Insurance 5. fitness papers 6. Vehicle registration 7. Can add credit card 8. Reports 9. Buy car 10. New registration 11. Renew License 12. Reports 13. Disable Driving license (optional) 14. Monitor Speed 15. Monitor Signals 16. Monitor route 17. Overtaking Other vehicle 18. Scan number plate 19. Take photograph of driver 20. Send notification to associated Operator 21. Add fine (optional) 22. Disable vehicle road permit(optional) 23. Automated Number Plate Recognition (ANPR) 24. Automated Parking Access 25. Parking Management 26. Security Analysis 27. Automated Ticketing

Application	Use case	Corresponding user story
	Add tax	As a user, I want to pay tax for buy a vehicle.
	Insurance	As a user, I want to buy insurance before buying a vehicle.
	Fitness Paper	As a user, I want to check fitness paper for buy a vehicle.
	Can add credit card	As a user, I want to add credit card for buy a vehicle.
Private Vehicle Monitoring System	can login	Marchant ,Vehicle owner ,BRTA and Traffic officer shall be able login
	Update Profile	User shall be able to update their profile
	New Registration	As a user, I want to register for driving license so that I can drive vehicles.
	Renew License	As a customer, I want to renew my license for future driving processes.
	Reports	As a user, I want to keep reports so that I can view my driving records and check penalty or disqualifications.
	Disable Driving license (optional)	As a disable user, I want to get license so that I can drive my own .

	Monitor Speed	System shall be able to detect accurate speed of a vehicle
	Monitor Signals	System shall be able to detect if vehicle is maintaining signals
	Monitor route	System shall be able to detect if vehicle is going through right route
	Overtaking Other vehicle	System shall be able to detect if vehicle is overtaking other vehicle in aggressive way
	Scan number plate	System shall be able to Scan number plate
	Take photograph of driver	System shall be able to Take photograph of driver
	Send notification to associated Operator	System shall be able to Send notification to associated Operator
	Add fine	System shall be able to Add fine
	Disable vehicle road permit	System shall be able to Disable vehicle road permit
	Automated Parking Access	As a user, I want parking access so that I can park my vehicle.
	Parking Management	As a Parking authority, I want parking management details to regulate and monitor the parking facility requirements and manage the car parking slots.

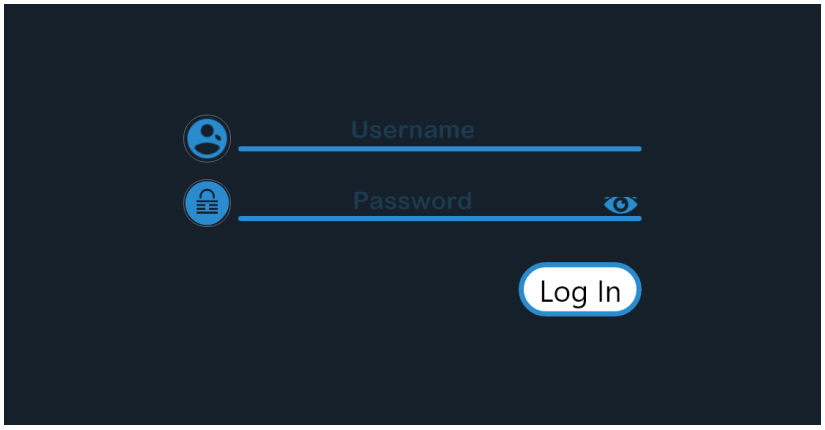
	Security Analysis	As a vehicle owner, I need security for creating a robust and secured parking solution.
	Automated Ticketing	As a client, I need ticketing system for getting smooth payment system.

4. External Interface Requirements

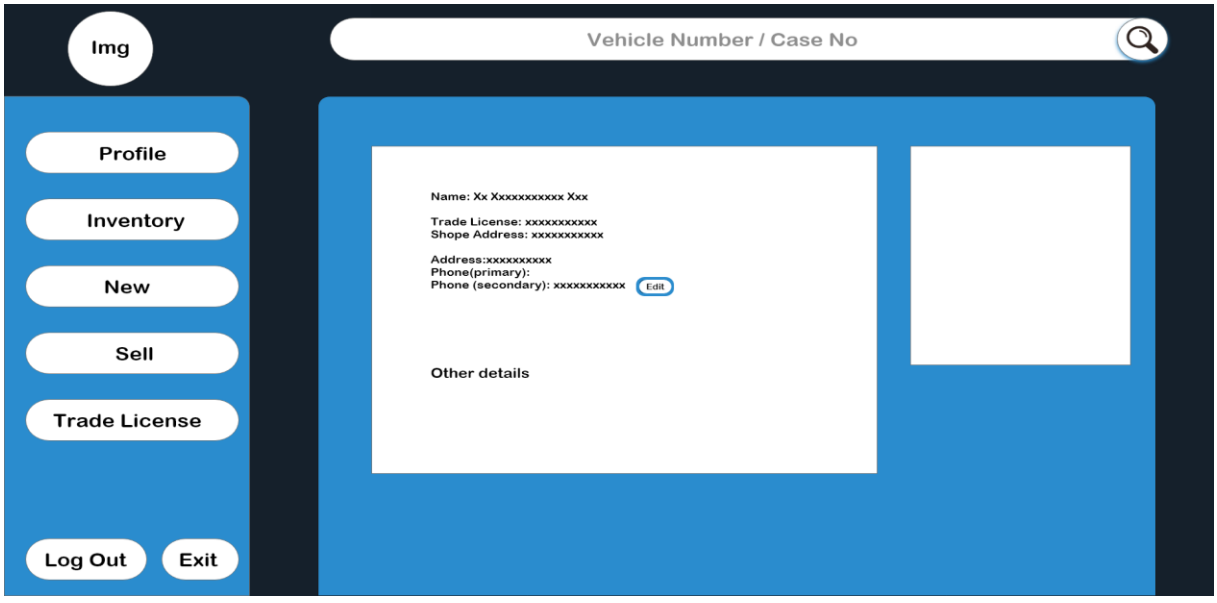
4.1 User interface

Prototypes : https://github.com/Born0/Software-Requirement-Engineering/blob/master/SRE(Traffic).xd

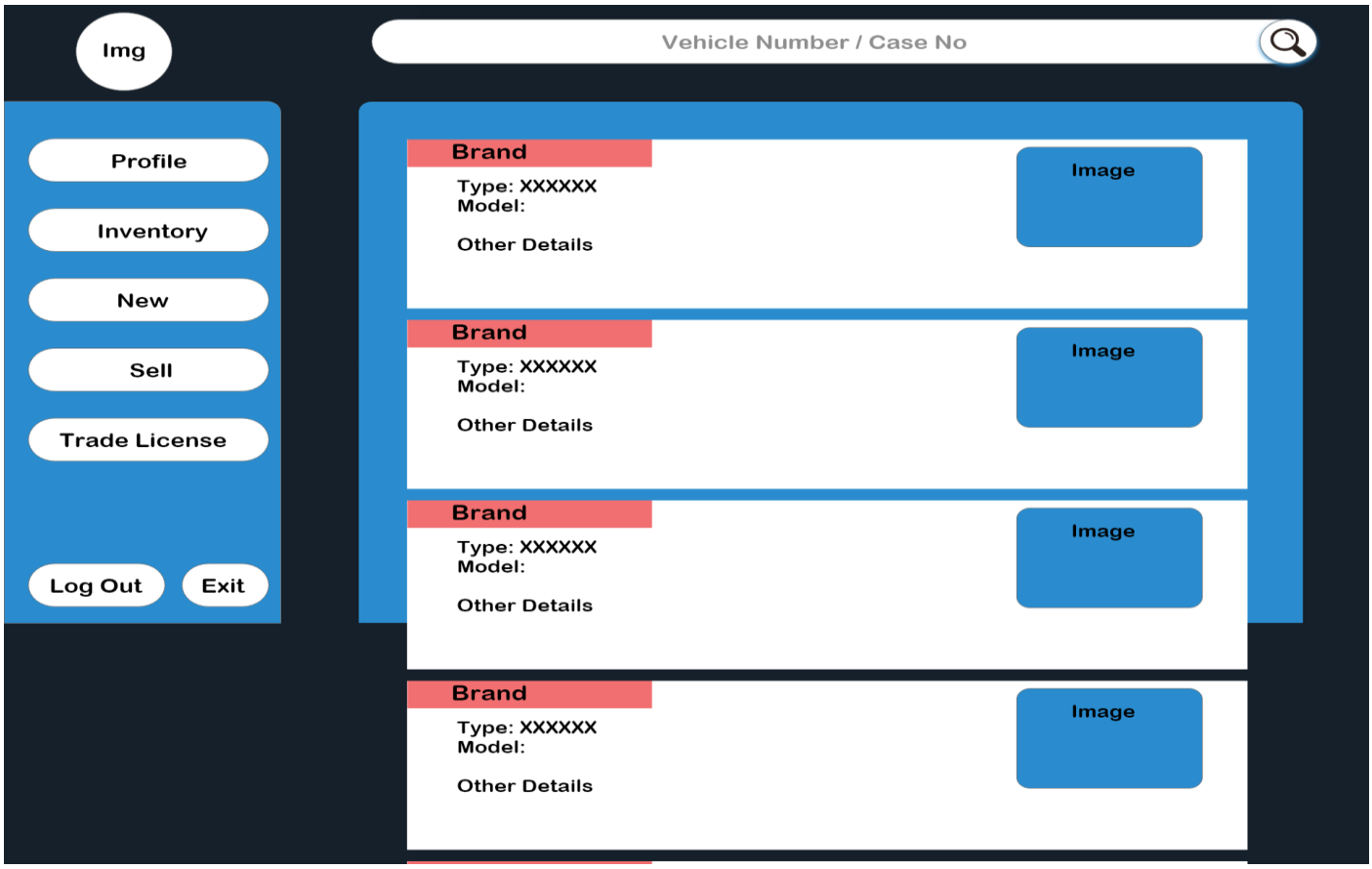
Log in:



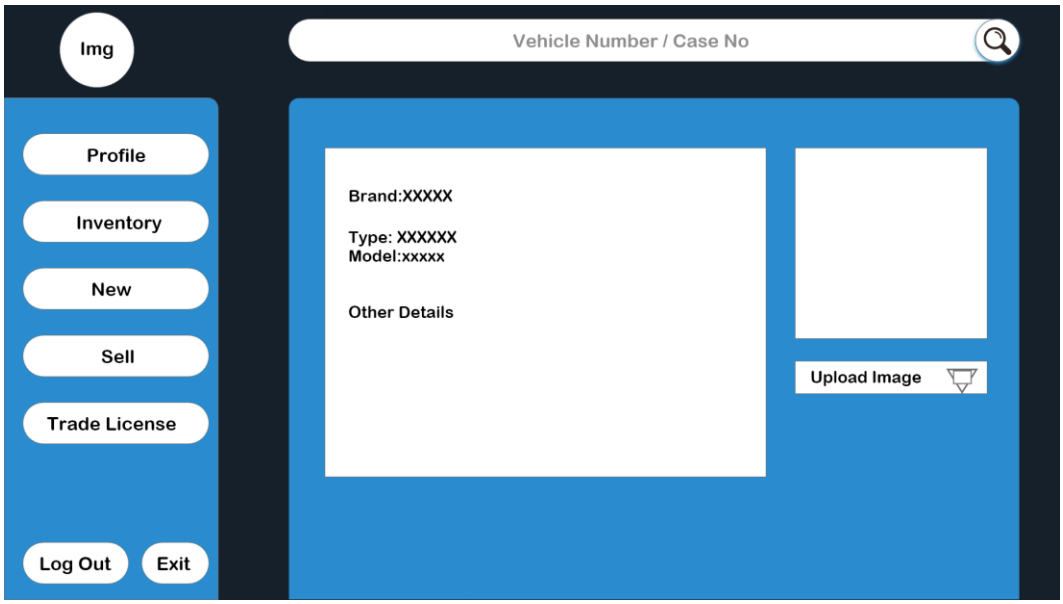
Marchant:



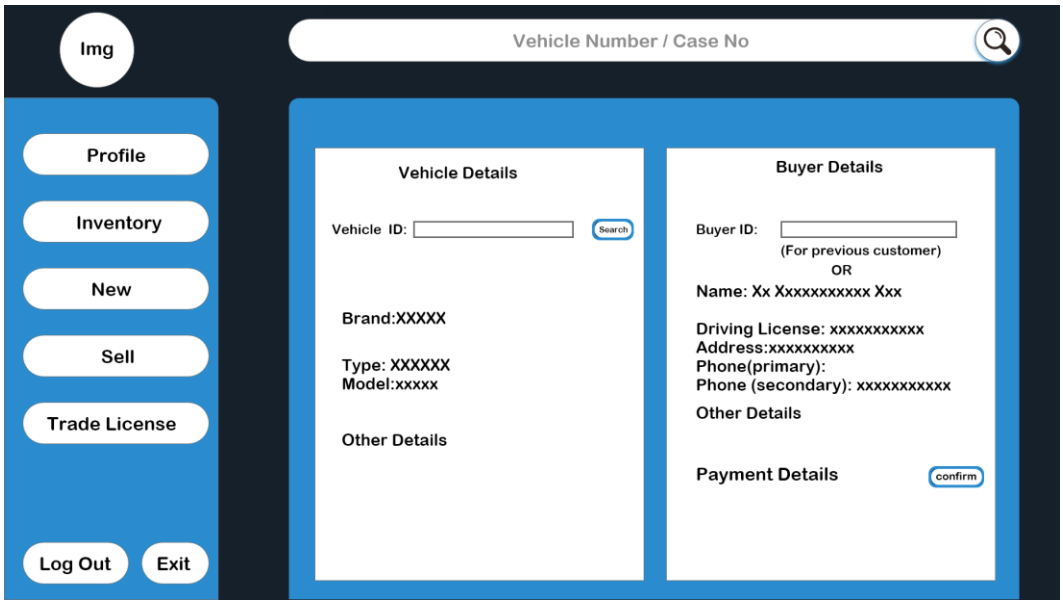
Details: Marchant's Profile



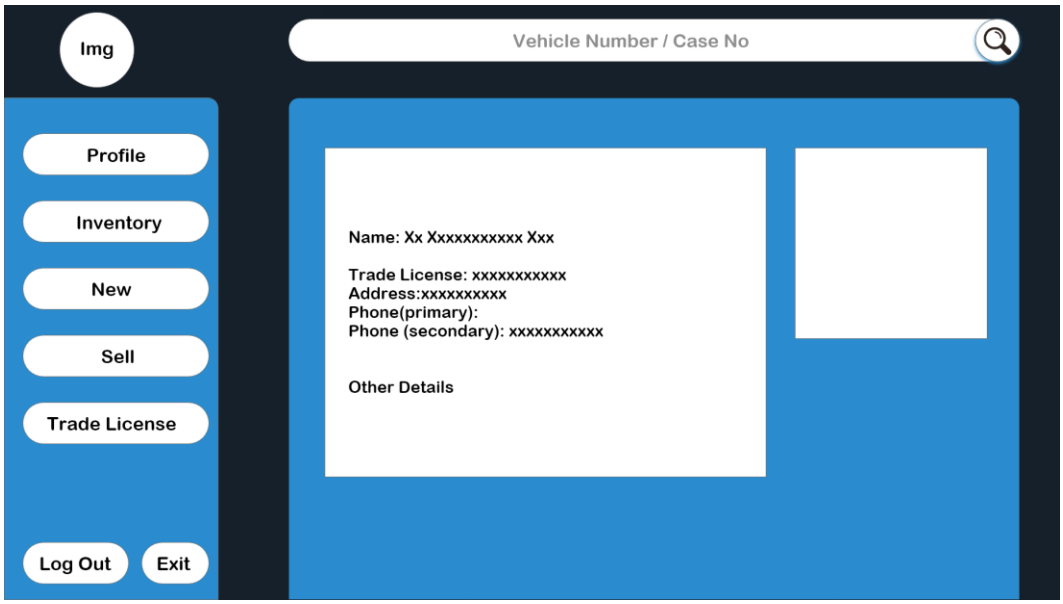
Details: Inventory



Details: Add new Product

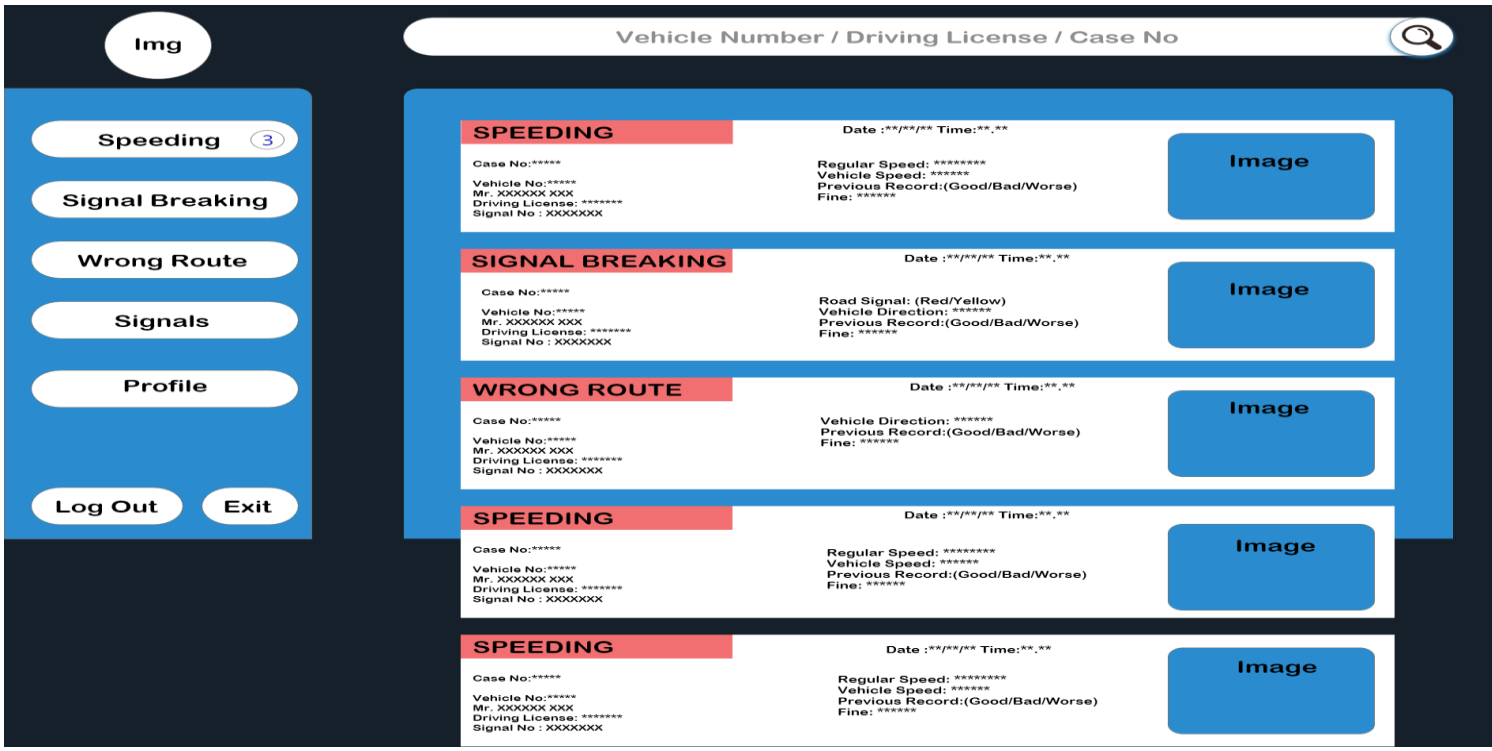


Details: Sell a Product

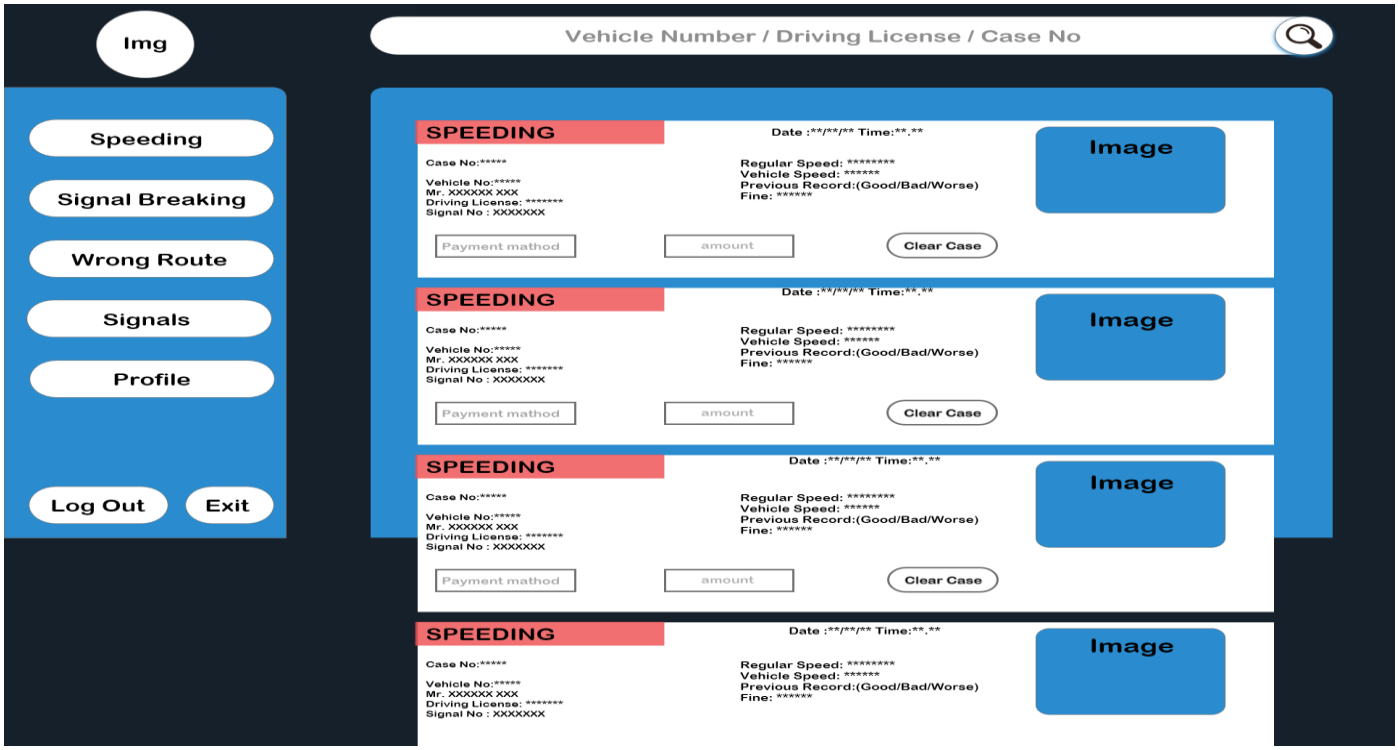


Details: Trade License Details

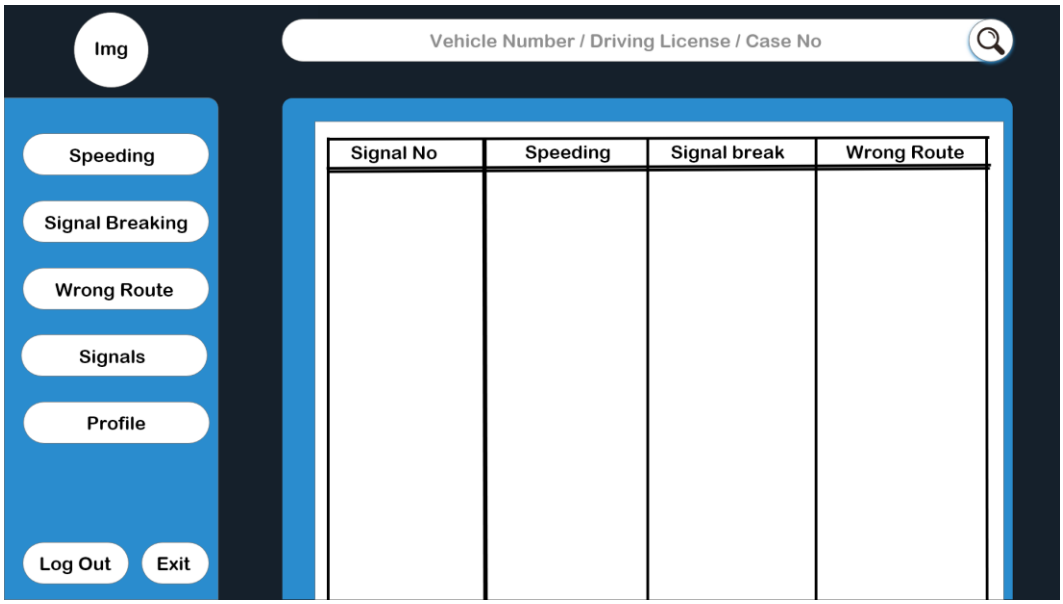
BRTA:



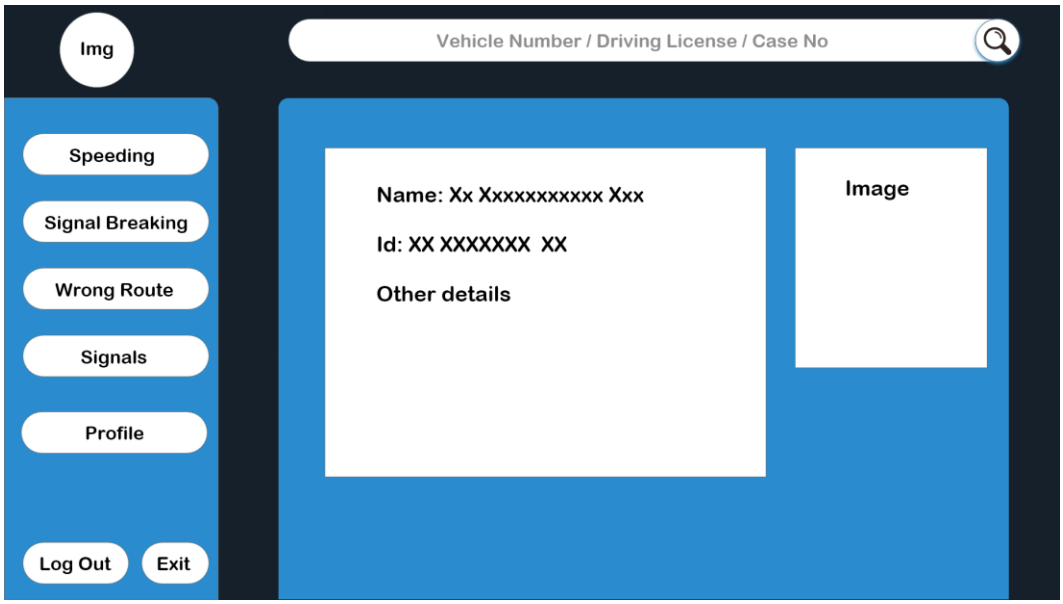
Details: News Feed



Details: Sub-Category

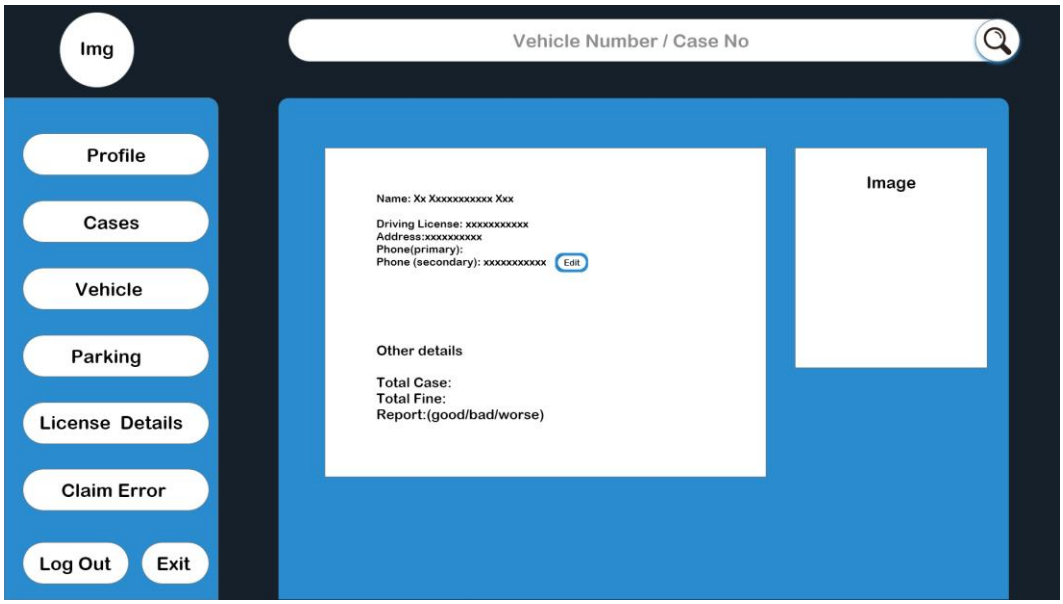


Details: Report for different Signals

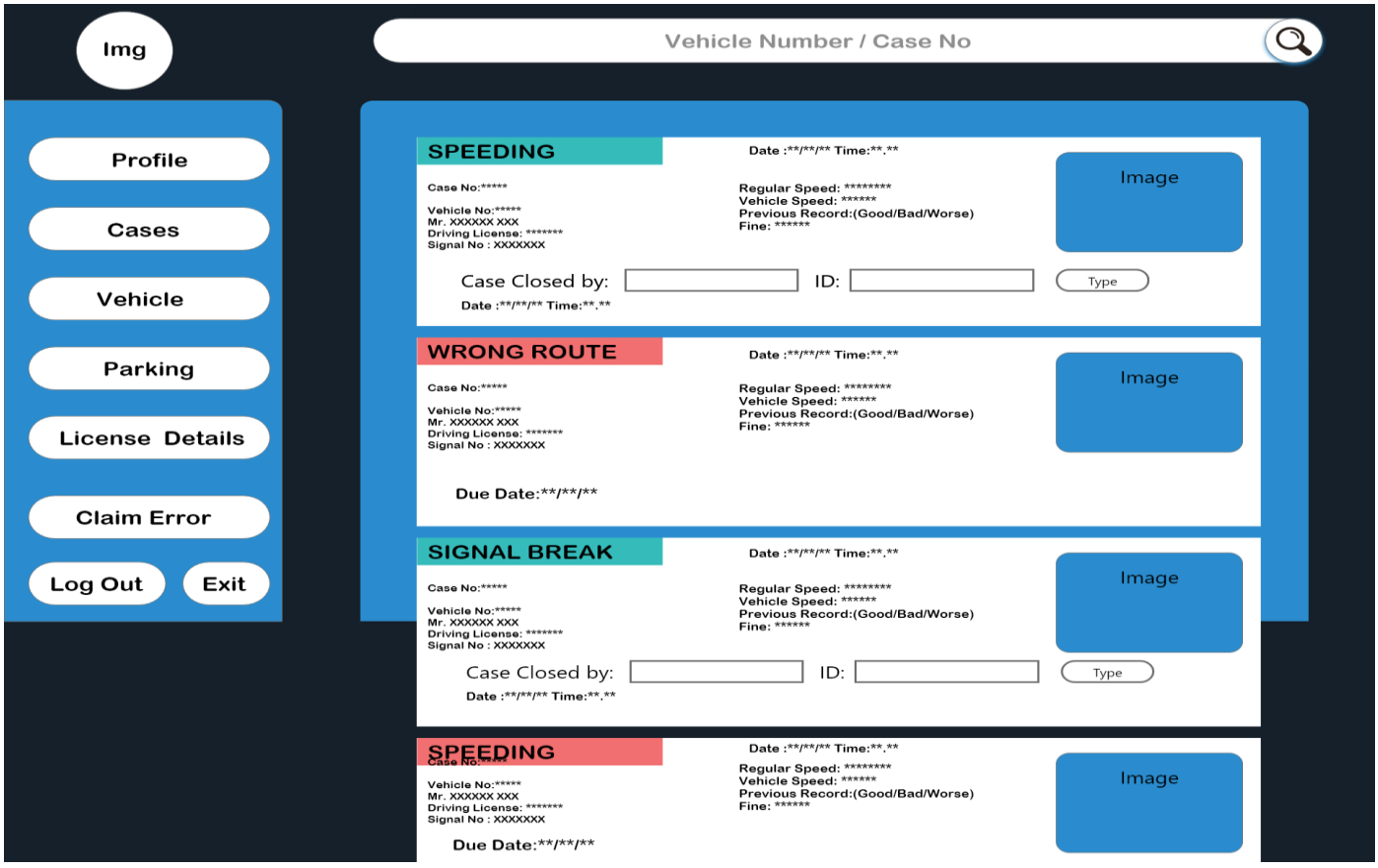


Details: User Profile

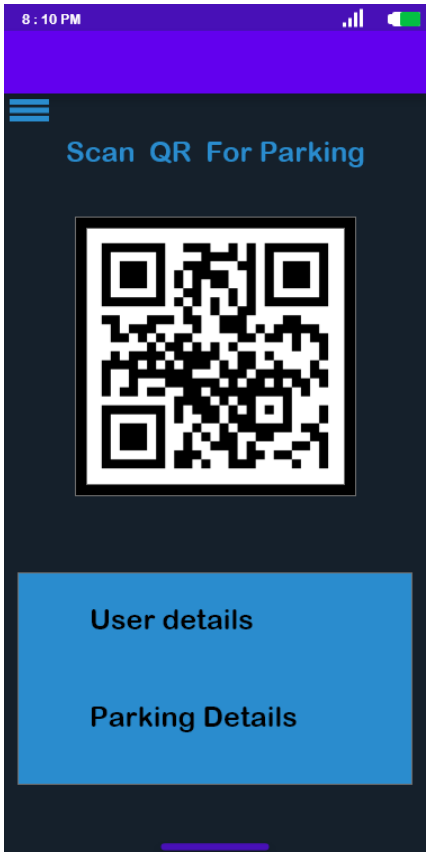
DRIVER:



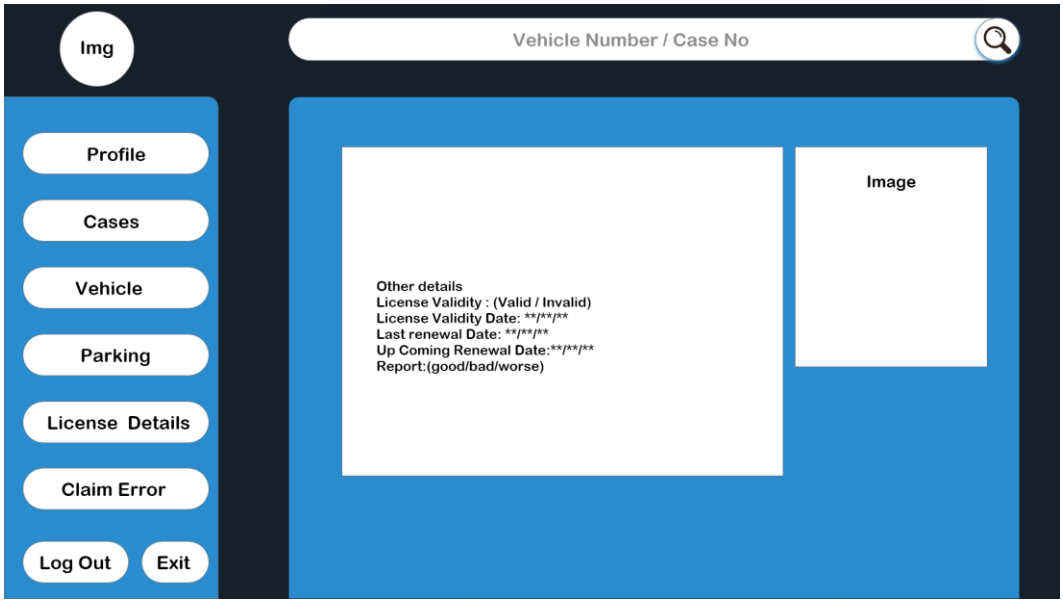
Details: Driver Profile



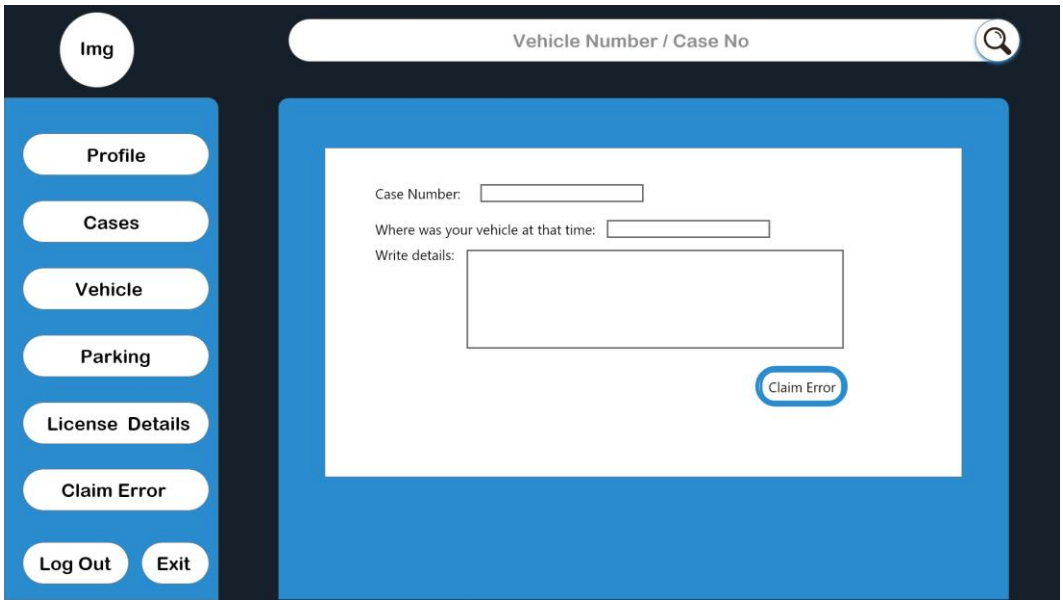
Details: Lifetime Case List



Details: parking Pass



Details: License Details



Details: Claim Error (case by mistake)

4.2: software interface: Operating system: windows, android, IOS, Microsoft word, adobe XD

4.3: Hardware interface: Not so many hardware used in this project. We used some simple hardware like Computer, Laptop, Mobile phone, Networking hardware etc. These devices are mainly used to check the feasibility the software.

4.4: Communication interface: github, trello, messenger, phone.

4.4 Communication interface

sA. Control center

A control center is a center which monitors the traffic, SMS from GSM Modems and other activities which takes place in road.

B. Microcontroller

Microcontroller (also MCU or µC) is a functional computer system-on-a-chip. It contains a processor core, memory, and programmable input/output peripherals.

C. SMS

Short Message Service (SMS) is a communications protocol allowing the interchange of short text messages between mobile telephone devices.

D. GSM

(Global System for Mobile Communications: originally from Group Special Mobile) is the most popular standard for mobile phones in the world

E. AT Commands

AT commands are instructions used to control a modem. AT is the abbreviation of Attention.

F. Speed sensor

It is a type of device which can be activated if the speed of a vehicle goes above a Threshold Value

G. GPS

Global Positioning System: a navigational system involving satellites and computers that can determine the latitude and longitude of a receiver

5. Quality Attributes

5.1 Usability:

Manage your vehicle from home: A vehicle management system helps to manage vehicle, store all important data about vehicle type, fitness, routes, stations, driver-helper-officer details, vehicle base performance etc.

Ensure the best profitability: Using automation in every section of business. Such as asset tracking, manage daily activities, get automatic calculation of finance. That's why to ensure the best profitability that should have an vehicle management system

Own a competent workforce: An automation system makes easy dealing of daily activities. One can specify your functionality as Admins, Super-admins Inventory manager & other employees activities. And have the system for monetising their performance to make them competent.

Manage inventory & expenses under control: Get all inventory record such as stock in hand, vehicle wise parts use report etc. We have designed a expense management system to take your inventory & expenses under control.

Take authentic decision: It includes an integrated system that helps you to keep all the information in one place. One can view all the data at a glance at any time, get instant report & can be able to take authentic decision.

Be the market leader of your industry: A computer based management system brings a supersonic speed to manage an organization, get report & ensure sustainable business growth. Having an automation system will help to be the market leader

5.2 Performance

It will give income and expenses report of all vehicles.

It will give vehicle wise parts uses report.

It will find out driver wise performance based information.

It will ensure best HRM. Such as: Drivers, Helpers, Other employees at a glance Report.

It will set an Alert Center. It will inform about all vehicle taxes, token, insurance, road permit, expiration date.

It will trace all over regular and irregular expenses.

It will apply an organized Inventory management system with regular income and expenses.

It has an automatic stock register.

It is an easy traceable stock and product system. Our system will manage best reporting system.

5.4 [others]

5.5 Cross-references

1) Engineering Advances, July 1997

2) Automation In Production - By Mikell P. Groover.

3) Salomon, Gavriel (1998). Individual and social aspects of learning:Review of research in education. Washington, D.C.: American Educational Research

Association. pp. 1–24.

4])McClanahan, Lorna (2014). "Training Using Technology in the Adult ESL Classroom". Journal of Adult Education. 43 (1): 22–27.

Perspective". CALICO Journal. 28 (2): 326–344. JSTOR calicojournal.28.2.326.

5) Murray, Liam; Triona Hourigan (2008). "Blogs for specific purposes:expressivist or socio-cognitivist". ReCall. 20 (1): 82–97. doi:10.1017/s0958344008000719.

6) Dieu, Barbara (2004). "Blogs for language learning". Essential Teacher. 1 (4): 26–30.

7)Thorne, Steven (2009). "'Community', semiotic flows, and mediated contribution to activity". Lang. Teach. 42 (1): 81–94. doi:10.1017/s0261444808005429.

8) Lam, Wan Shun Eva (2004). "Second language socialization in a bilingual chat room:global and local considerations". 8 (3)

6. Data Requirements

6.1 Logical data model – UML diagrams

ID	Name	Email	Phone Number
16-33047-3	Iqbal, Md.Ahasan	ahasaniqbal97@gmail.com	01812791998

6.2 Data dictionary -s

Entity	Attribute	Type/size	validation	Key
user	userID	Number (5)	10000-9999	primary
user	Forename	Text (10)	Required	
user	Surname	Text (15)	Required	
user	DOB	Date (8)	Valid Date	
Vehicle seller	userID	Number (5)	10000-9999	primary
Vehicle seller	sellername	Text (15)	Required	
Vehicle owner	OwnerID	Number (6)	9999-1111	Primary
Vehicle owner	Forename	Text (10)	Required	
Vehicle owner	Surname	Text (15)		
Owner license	licenseID	Number (13)	11110-11111	Primary
Owner parking	parkingID	Number (13)	11110-11111	Primary
BRTA officer	officerID	Number (15)	999-100	Primary
BRTA officer	officername	Text (12)	Required	

Parking manager	managerID	Number (10)	1000-9999	Primary
Parking manager	managername	Text (12)	Required	