Road Symbol Voice Alert System

(DG Symbol)

A PROJECT REPORT

Submitted by

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In fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

Computer Engineering

V.V.P. Engineering College, Rajkot

Gujarat Technological University

Ahmedabad

April, 2019

V.V.P. Engineering College, Rajkot

Computer Engineering Department

April 2019

CERTIFICATE

Date:

This is to certify that the project reports, submitted along with the project entitled ***Road Symbol Voice Alert System*** *has been carried out by* ***Ahya Hemang*** *under my guidance in partial fulfillment for the degree of* ***Bachelor of Engineering*** *in* ***Computer Engineering 8th Semester*** *of Gujarat Technological University, Ahmedabad during the academic year 2018-19. These students have successfully completed project activity.*

Prof. Naren Tada
Internal Guide
CE Department

Dr. T P Pataliya
Head Of Department
CE Department

ACKNOWLDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is only due to such supervision and assistance and I would not forget to thank them. I owe my deep gratitude to our project guide **Mr. Naren Tada**, who took keen interest on our project work and guided us all along, till the completion of our project work by providing all the necessary information for developing a good system.

Hemang Ahya
(150470107001)

ABSTRACT

This project is entirely based on the upcoming IOT and is only for the fact based on making our lives easy on the road. There has been made a lot of changes in the construction of vehicles on to the basis of road accidents due to fog, rain or hail conditions, for example the outlining of BS3 engines to an upgrade to BS4. Those changes were good for the lot as a safety measure disregarding the unconscious nature of the driver or we can also say a better software implement. This is a developed GPS NARRATION system fitted in a vehicle which indicates you through all the available road conditions beforehand and to all the road signs beforehand to let you drive safe and in a conditional way. This is a well under developing software solution. It is also a solution to some of the road signs that are faded due to the effect of weather or defected due to vandalism. Some of these symbols are quite mandatory, cautionary and informatory. This is especially for the output of those signs on the roadside which are meant for instruction. This can effectively prevent accidents as eyes may differ in sight, but the voice command can easily work for attention gainer than those of the signs. And these all factor tends to work as effective as a moving vehicle.

Introduction

Personal Details:

Team Size:

1

Team Leader:

Ahya Hemang

(150470107001)

Project Profile:

Title:

Road Symbol Voice Alert System in Vehicle

Id:

34801

Internal Guide:

Mr. Naren Tada (VVP, Rajkot)

Scheme:

UDP (User Defined Project)

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1. Introduction

Road Symbol Voice Alert System is a system that user can get alert of voice message of road symbol with image and some information at a time of driving. User can also allow the register new symbol at different location.

1.1 Project Summery

This system uses the GPS system. Using GPS device get current location and check for the registered symbol at that location and if it's exist then alert voice message of particular symbol. Road symbol may be unknown for user so they can get the information from system, and also prevent accident due to absence of the road symbol or invisible of road symbol due to rain or fog.

User can also register new symbol as like register new place in Google map. And admin can verify the symbol for an alert. Admin can also manage the database and also user.

1.2 Purpose

- Prevent Accident
- Safe Drive
- Voice Alert of Road Symbol
- Get information of Road Symbol
- Manage data of road symbol

1.3 Scope

The scope of this project spared from an individual to group of wealthy society as for safety. The scope varies from District to State to Country.

1.4 Objective

Outcast security from damaged or vandalized or unknown road signs for one's safety.

1.5 Required Tools

- Text Editor
- Server
- Domain Name
- Hosting
- Internet(Browser)
- GPS

2. Literature Review

2.1 Detailed Literature review

FRONT-END:

In this project i have used a bunch of tools while developing the front-end for our system, Road Symbol Voice Alert System. Front end development is not only the designing; it includes the design as well as the applicability of that design to the development codes. Front-end developer has to apply the effort of web designer to the developing webpage by transforming their well-designed structures and layouts into the actual coding of the system.

Hypertext Markup Language (HTML) is the ideal paradigm markup language for creating web pages and web applications. HTML5 is the current version of the HTML. With Cascading Style Sheets (CSS) and JavaScript (JS) it produces a triad of fundamental technologies for the World Wide Web. CSS's latest updated version is CSS3. Web browsers receive HTML documents from a web server or from local storage and render them into web pages. HTML outlines the structure of a web page semantically and originally included cues for the appearance of the document.

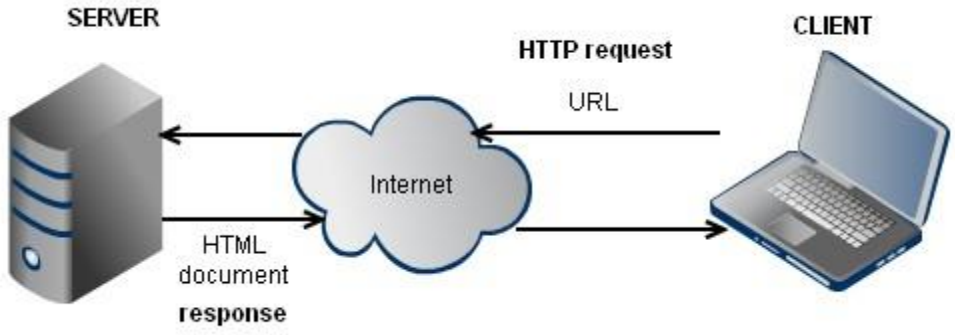
Bootstrap is a free and open-source front-end framework for designing websites and web applications. It contains HTML- and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions.

AJAX stands for Asynchronous JavaScript And XML, a web development technology used for front-end designing that allows you to load your data in the background and gives the output in browser i.e. web page without refreshing the page. This is the main benefit of the AJAX that it allows you to create ng interactive web applications. AJAX is web technology that is independent of web server software. Thus, provides the facility to develop the better, faster and greater web applications that is improve the user experience through the interaction.

BACK-END:

Here we are using MYSQL as back end tool.

MySQL is the most famous open source database software. It provides the superior speed, reliability and ease of use. MySQL has become the preferred choice for web. Many of world's largest and fastest-growing organizations use MySQL to save time and money powering their high-volume Web sites, critical business systems, and packaged software. MySQL was originally founded and developed in Sweden by two swedes and a Finn: David Axmark, Allan Larsson and Michael Monty Widenius, who had worked together since the 1980's.
PHP: Hypertext Preprocessor is a server-side scripting language designed for Web development, but also used as a general-purpose programming language. It was originally created by Rasmus Lerdorf in 1994, the PHP reference implementation is now produced by The PHP Group.



[Figure 1: Client-Server Architecture]

2.2 Technology Stack:

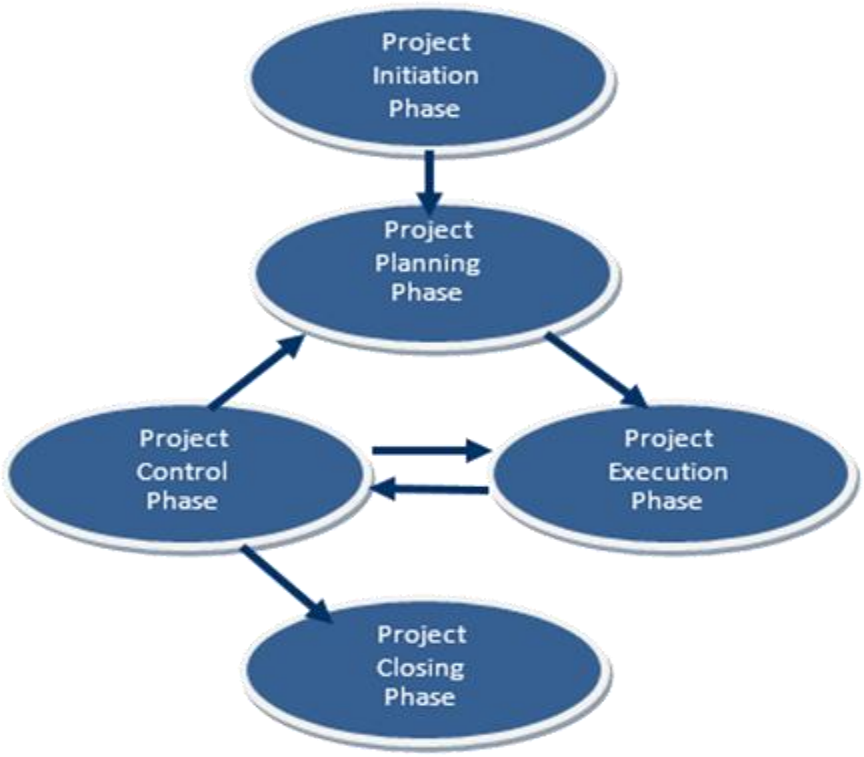
- **Web-design:-** HTML, CSS, BOOTSTRAP
- **Programing Language:-** PHP
- **Database:-** MySQL
- **Scripting Language:-** Java Script, AJAX
- **Tool Use:-** Editor, XAMPP, Google Map

3. Design Analysis

It is a powerful software technology that simulates the physical behavior on the computer. Instead of constructing a prototype and developing elaborate testing regimens to analyze the physical performance of a product, engineers can extract this information expeditiously and accurately on the computer.

3.1 Design methodology introduces to the development of a system or method for exclusive circumstances. Today, the term is most often applied to technological fields in reference to web design, software or information systems design. The key to design methodology is realizing the best solution for each design situation, whether it be in industrial design, architecture or technology. It focuses on the brainstorming to encourage the innovative ideas and collaborative thinking to work through each proposed idea and achieve at the best solution.

3.2 Implementation strategy is the way of developing the project step by step in a well-structured manner that it does not need to redesign or need not more changes. The strategy selected by the developer is the outcome of estimation done on the basis time, effort, cost and technologies. It is formation of well analyzed and designed stages in a systematic manner.



[Figure 2: Project Implementation Methodology]

Project Initiation Phase is the initialization of a project that determines the basic idea to develop the project. It will explore the every detail about the project for the development of a successful product such that the purpose and scope of the project, strengths and weaknesses of the idea of project, required resources, existing business or proposed venture, opportunities and threats presents in a natural environment, and the prospects for success.

Project Planning Phase is the planning phase for the project what to do and how to do. What to do will explore about the requirements of the project. How to do will find the ways to implement those planning ideas or in other ways, this will show the actual concept for doing the activities carried out in the previous stage in the real world. This phase will look for another techniques is the risk analysis and identification. Thus, systematic attempt will be taken to specify the risk to project plan, scheduling resources, project development.

In the **Project Execution Phase**, the actual execution of the project takes place. Here all the aspects will be developed those are described in the previous stage. This phase will implement the strategic requirements stepwise using the methodology selected by the project developer or project manager. This will carried out the entire requirements in to the existence.

Project Control Phase tracks the project for the proper sequence, guideline and as per the allocated timeline. This phase will constantly monitor the project execution phase for the quality measurement and to validate the project timeline for the project to be carried out within the deadline. Not only the timeline will measure here, it will focus on the quality aspects also as far as the development is in the running phase. The risk factors that affect the project and harm it unexpectedly are avoided for the better performance of the developing product.

Project Closing Phase is the phase will customer is getting involved in the developed project or product. The reviews of the customers will be asked for the evaluation of the project. Based on those feedbacks, the modifications are to be done in the project for the customer satisfaction. This phase will work on all the test cases determined in the previous phase and constantly checking for the better quality of a product.

3.3 Problem and Weakness of Current System

- Less sensitivity of sensor
- Sensor may not work due to rain or fog
- Voice alert of symbol
- Unaware from road symbol
- Vandalism
- Absence of road symbol

3.4 Requirements of New System

- Prevent accident
- Better transportation
- Detail of road symbol
- Without use of sensor
- Voice alert of road symbol

4. System Requirement Specification

4.1 Software Requirement Specification(SRS)

❖ Introduction

This SRS provide a complete description of Road Symbol Voice Alert System.

- **Purpose**
  Make a system that gives voice alert of road symbol at a time of driving.
- **Scope**
  This system allow user to register new road symbol as well as get voice alert of road symbol for safety purpose.
- **Definition**
  SRS-Software Requirement Specification
  GUI-Graphical User Interface
  Register Symbol-the person who will participate in system
  Ex. User, Admin etc.
- **Overview**
  This system provides an easy solution of manage database of road symbol
  And also get alert of road symbol with information.
- **Additional Information**
  This system works on internet server and using GPS, so it will operated by web hosting.

❖ General Description

This system admin and user's base idea in mobile, tablet, devices in vehicle.

❖ Functional Requirements

- **Registration**
  If user visit the system the very first time then user need to register them self and verify some details for further operation.
- **Login**
  User can login to the system using id and password.
- **Register new Symbol**
  Register new road symbol with location and some of their details.
- **View Status**
  User can show the status of the registered road symbol by them.
- **Logout**
  User can logout from the system.
- **Voice Alert**
  User get the voice alert of road symbol at a time of driving.
- **Get Information**
  User can also get the information of road symbols which are unknowns for them.

❖ Technical Issues

Require internet server which able to run application.
Use GPS for get location information.

❖ Interface Requirements

- **GUI**
  - Home Page
  - Login/Signup page
  - Register New Symbol Page
  - Contact us
  - Profile
  - Status
- **Hardware Interface**
  - Computer/Mobile
  - Server
  - GPS
  - Internet
- **Software Interface**
  - Hosting Panel
  - PHPMyAdmin
  - Domain name

❖ Performance Requirements

- Internet Connection
- Bandwidth
- Accuracy in Location

❖ Design Constrain

- Bootstrap, JQurey, AJAX
- W3C Standards

❖ Other non-Functional Requirements

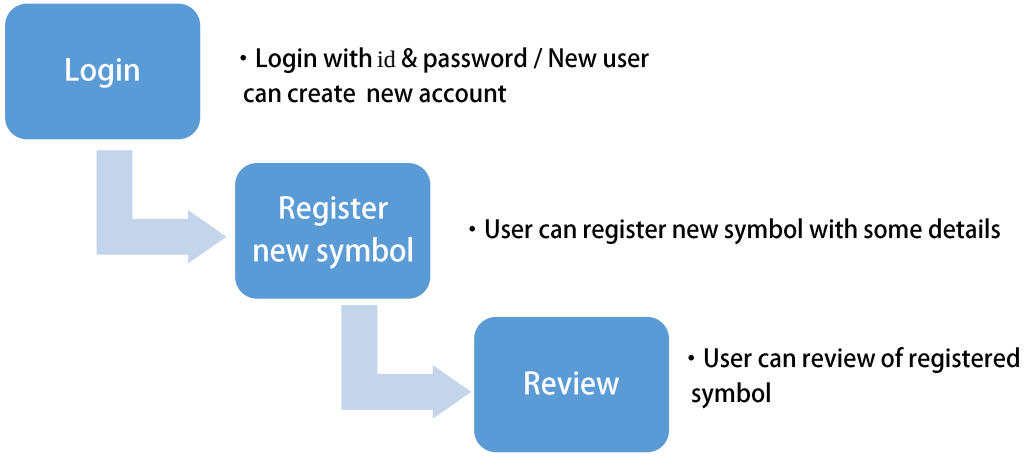
- **Security**
  - **SSL** (Secured Socket Layer) in all phase.

- Logout all user after a period of time.
- Back-end server only for authenticated admin.

- **Reliability**
  - Automatic backup of database.
- **Availability**
  - **24 x 7** Availability.
- **Maintainability**
  - Secured Database.
- **Portability**
  - Run on all platforms.

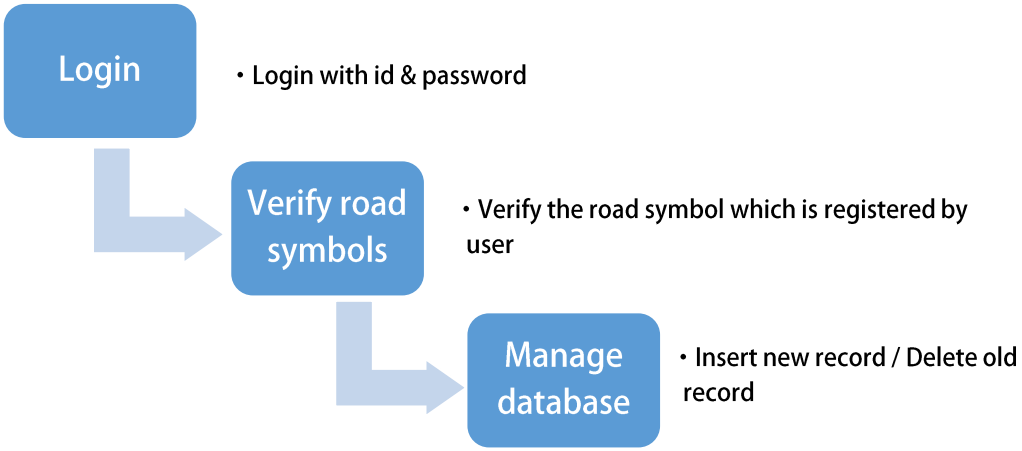
4.2 Block Diagram

- **User Side**



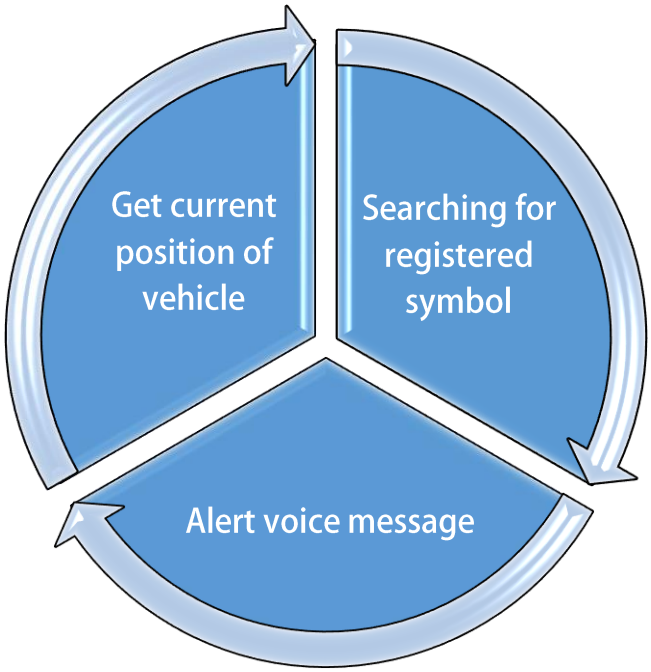
[Figure 3: Block Diagram at User Side]

- **Admin Side**



[Figure 4: Block Diagram at Admin Side]

- **Working Flow**



[Figure 5: Block Diagram of Working Flow]

5. System Analysis

System Analysis is a procedure of gathered and interpreting facts, identifying the problems, and decomposition of a system into its components.

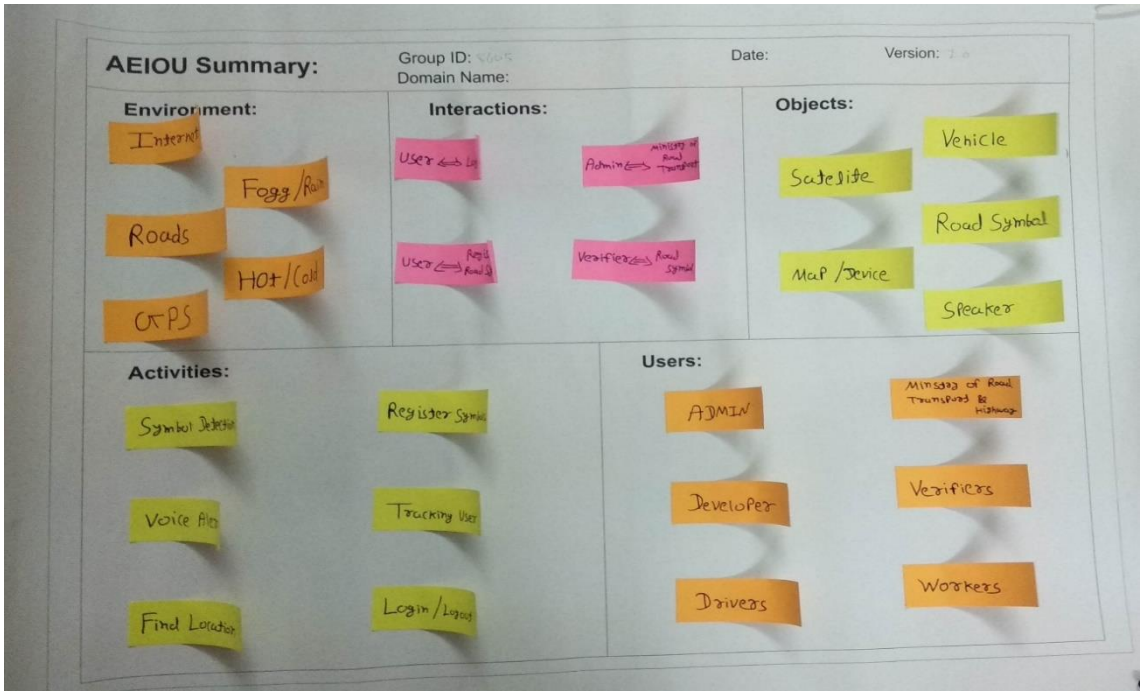
System analysis is organized for the purpose of studying a system or its parts in order to identify its goals and objectives. It is a problem solving approach that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose.

Analysis specifies what the system should do.

5.1 Design Engineering Canvas

5.1.1 AEIOU Canvas

This is very fast canvas of our design engineering subject. After thinking on different domains we have selected one domain and have done the observation. After completing our observation we have divided the complete observation into 5 parts into AEIOU that is A fro Activity, E for Environment, I for Interaction, O for Objects and U for User. With the help of this canvas we have make the partition of our complete observation through which we can easily identify the key points of our observation from which we can knew about the problems which are faced.



[Figure 6: AEIOU Canvas]

- **A – Activity**
  - Login/Logout
  - Register New Symbol
  - Voice Alert

- Symbol Detection
- Find Location
- Moving Vehicle

- **E – Environment**

  - Internet
  - Fog/Rain
  - Roads
  - GPS
  - Hot/Cold

- **I – Interaction**

  - User-Login/Logout
  - User-Register Road Symbol
  - Admin-Ministry Of Road Transport & Highway
  - Verifier-Road Symbols

- **O – Object**

  - Vehicle
  - Satellite
  - Map/Device
  - Road Symbol
  - Speaker

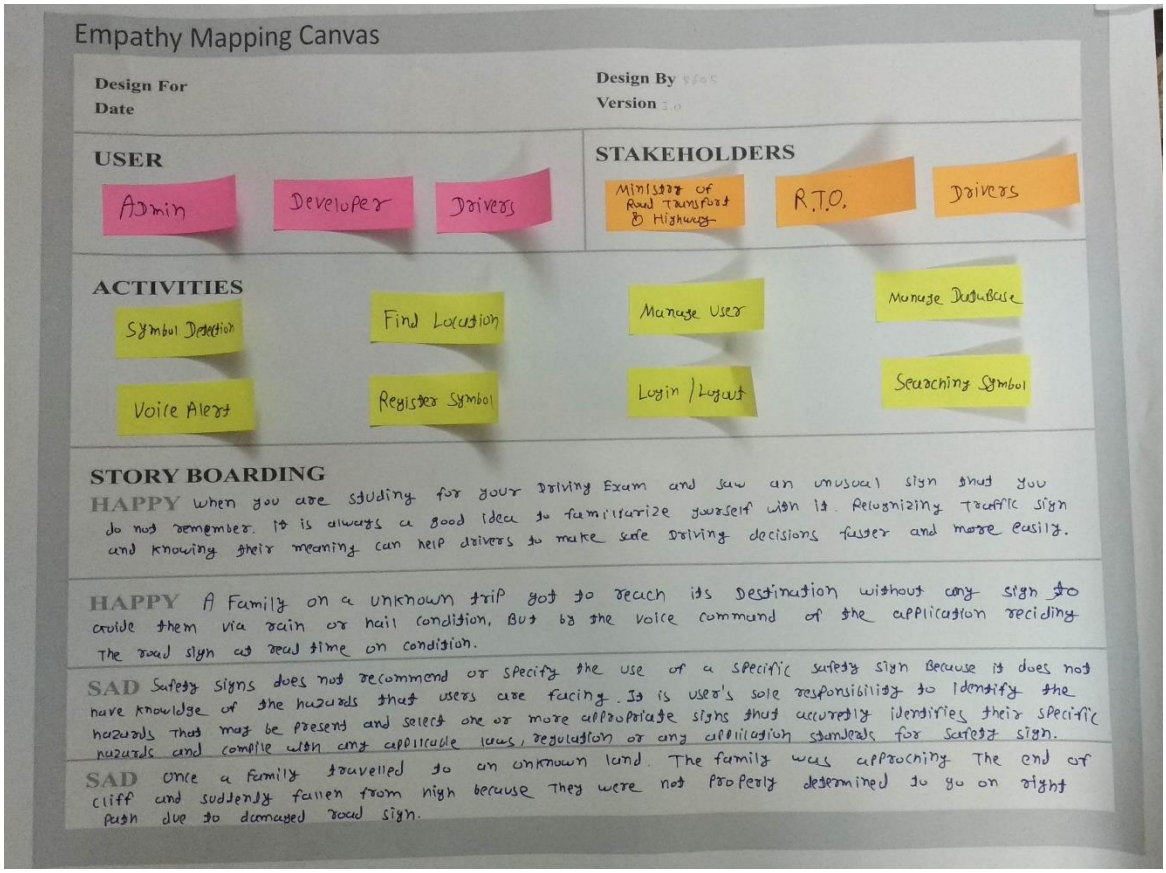
- **U - User**

  - Admin
  - Developer
  - Drivers
  - Verifiers
  - Workers
  - Ministry of Road Transport & Highway

5.1.2 Empathy Mapping Canvas

Empathy means to feel what the other feel.
Empathy Mapping Canvas help as to experience, feel and understand another person's condition, situation, and emotion with the help of observation.

Empathy Mapping Canvas is the evolution of problem, which are faced by people, by experiencing it when faced by us. This helps us to experience the problem the think about the solution for it.



[Figure 7: Empathy Canvas]

- **User**
  - Admin
  - Developer
  - Drivers
- **Stakeholders**
  - Drivers
  - Ministry Of Road Transport & Highway
  - RTO
- **Activities**
  - Login/Logout
  - Register New Symbol

- Voice Alert
- Symbol Detection
- Find Location
- Manage Database
- Searching Symbol

- **Story Boarding**

❖ **Happy Story**

When you are studying for your driver's exam and saw an unusual sign that you do not remember, it is always a good idea to familiarize yourself with it. Recognizing traffic signs and knowing their meanings can help drivers make safe driving decisions faster and more easily.

❖ **Happy Story**

A family on an unknown trip got to reach its destination without any sign to guide them via rain or hail but by the voice commands of the application receding the road signs on conditions.

❖ **Sad Story**

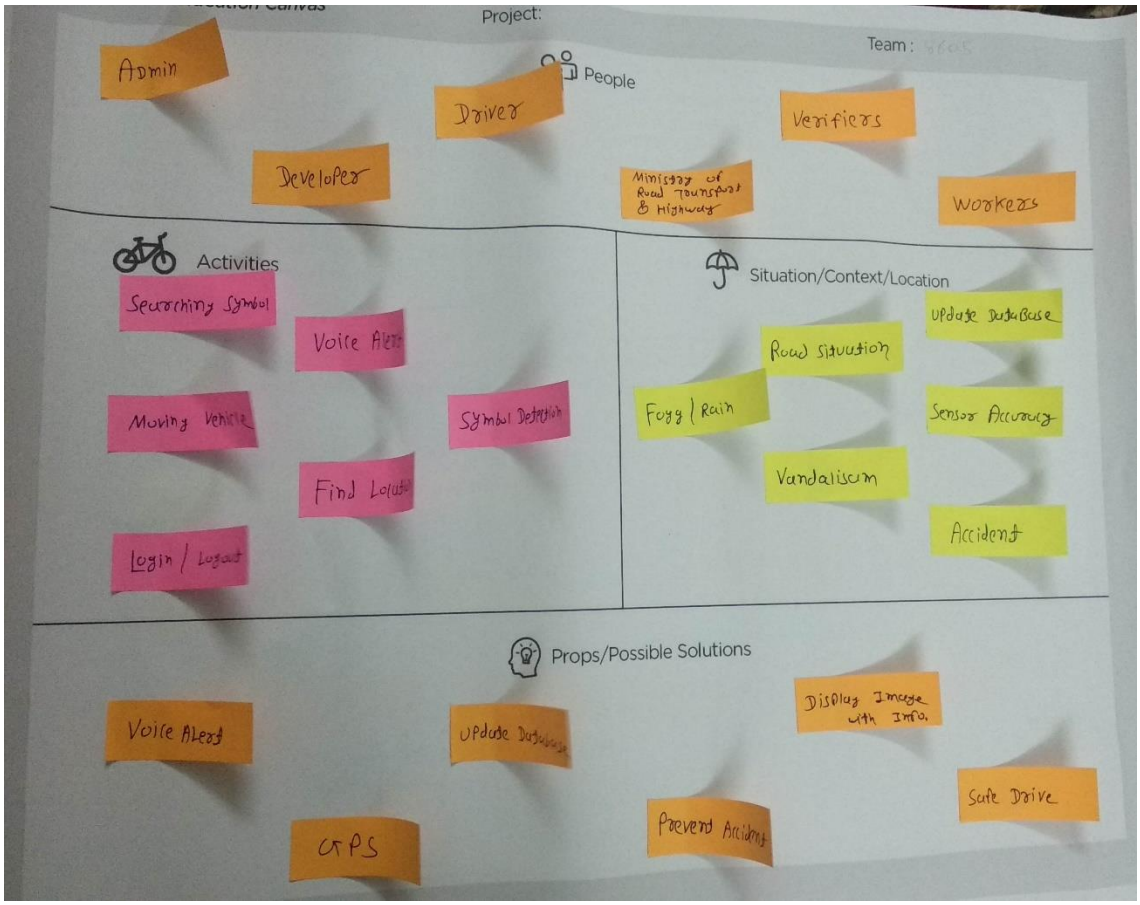
Once a family travelled to a unknown land. The family was approaching the end of cliff and suddenly fallen from high because they were not properly determined to go on right path due to damaged road sign.

❖ **Sad Story**

Safety signs does not recommend or specify the use of a specific safety sign because it does not have knowledge of the hazards that users are facing. It is user's sole responsibility to identify the hazards that may be present and select one or more appropriate signs that accurately identifies their specific hazards and complies with any applicable laws, regulations or any applicable standards for Safety Sign.

5.1.3 Ideation Canvas

Ideation Canvas help us in doing the work creatively. Because Ideation Canvas develops the new thoughts and ideas in the mind through which we can know about the problems and what should be the solution for it Ideation Canvas has four main parts User, Activity, Situation/Location and Props/ Object.



[Figure 8: Ideation Canvas]

- **People**
  - Admin
  - Developer
  - Drivers
  - Verifiers
  - Workers
  - Ministry of Road Transport & Highway
- **Activities**
  - Login/Logout
  - Register New Symbol
  - Voice Alert
  - Symbol Detection
  - Find Location
  - Moving Vehicle

- **Situation/Context**

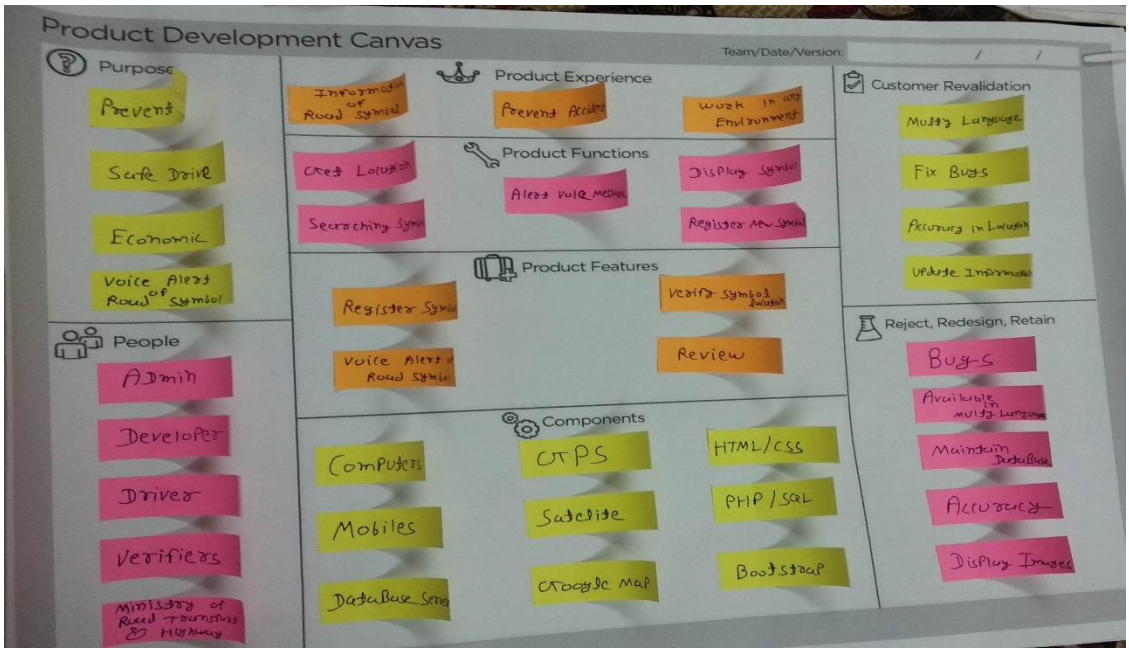
  - Fog/Rain
  - Road situation
  - Accident
  - Update database
  - Sensor Accuracy
  - Vandalism

- **Props/Possible Solution**

  - Voice Alert
  - GPS
  - Prevent Accident
  - Update Database
  - Safe Drive
  - Display Image With Information
  - User's Review on Symbol

5.1.4 Product Development Canvas

Product Development Canvas Concentrate on Solution of the Problems. In the Canvas we describe about the product that is the one solution of entire problem. Solution includes the features like Purpose, People, Product, components, and Product Features etc.



[Figure 9: Product Development Canvas]

- **Purpose**

  - Prevent Accident
  - Safe Drive
  - Economic
  - Voice Alert of Road Symbol

- **People**

  - Admin
  - Developer
  - Drivers
  - Verifiers
  - Workers
  - Ministry of Road Transport & Highway

- **Product Experience**

  - Information Of Road Sign
  - Prevent Accident
  - Work in Any Environment

- **Product Function**

  - Get Location
  - Searching Symbol
  - Alert Voice Message
  - Display Symbol
  - Register New Symbol

- **Product Features**

  - Register Symbol
  - Multiple Language
  - Review

- **Components**

  - Computers
  - Mobile/Tablets

- Database Server
- GPS
- Satellite
- Google Map
- HTML/CSS/BOOTSTRAP
- PHP/SQL

- **Customer Revalidation**

  - Multiple Language
  - Fix Bugs
  - Accuracy in Location
  - Update Information

- **Reject, Redesign, Retain**

  - Available in Multiple Language
  - Bugs
  - Maintain Database
  - Accuracy
  - Display Images With Information

5.2 Functions of System

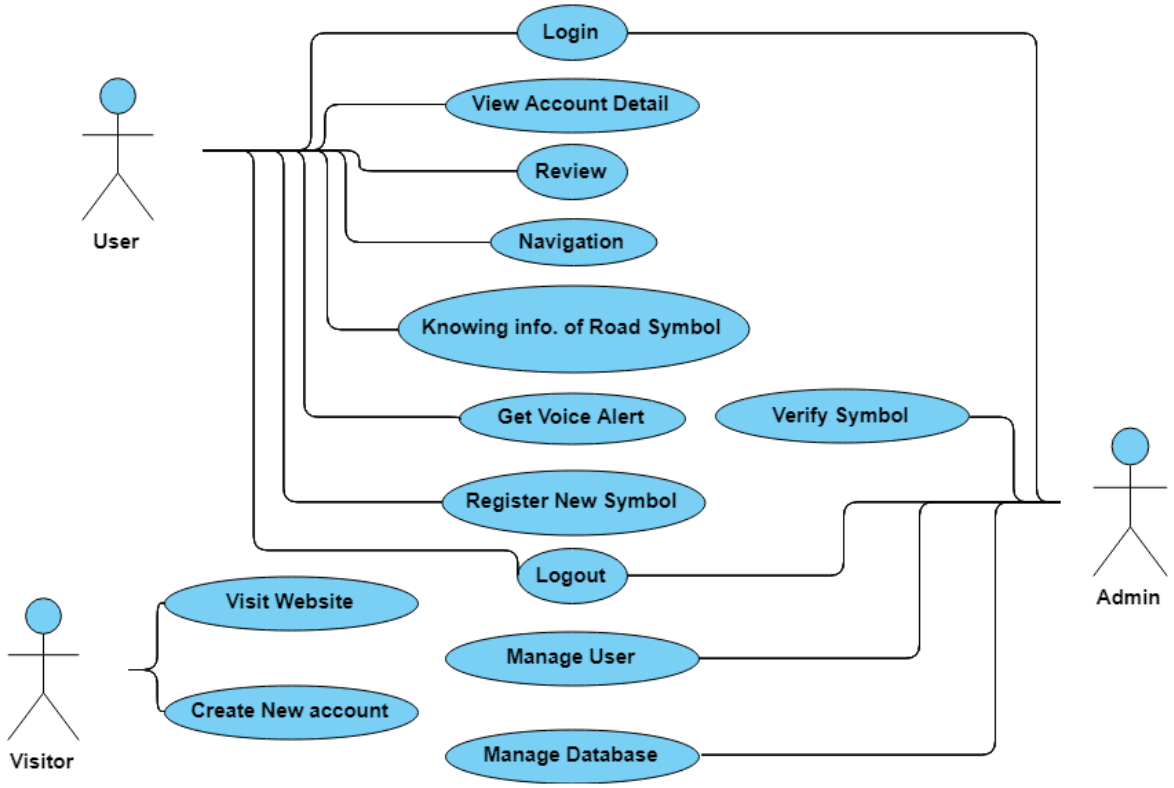
- **User Side**

  - Create new account
  - Login/logout
  - Register new symbol
  - Get voice alert
  - Review
  - Get information of road symbol

- **Admin Side**

  - Manage database
  - Manage user
  - Verify symbol location

5.2.1 Use Case Diagram



[Figure 10: Use Case Diagram]

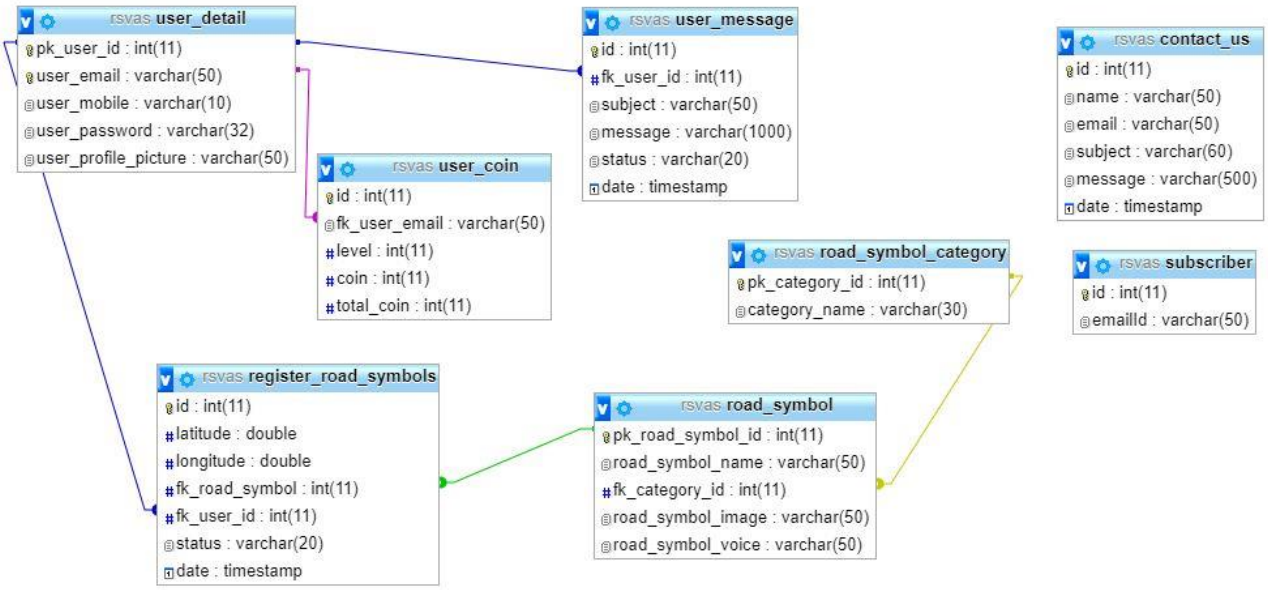
5.3 Data Modeling

Data modeling is the process of documenting a complex software system design as an easily understood diagram, using text and symbols to represent the way data needs to flow. The diagram can be used as a blueprint for the construction of new software or for re-engineering a legacy application.

Traditionally, data models have been built during the analysis and design phases of a project to ensure that the requirements for a new application are fully understood.

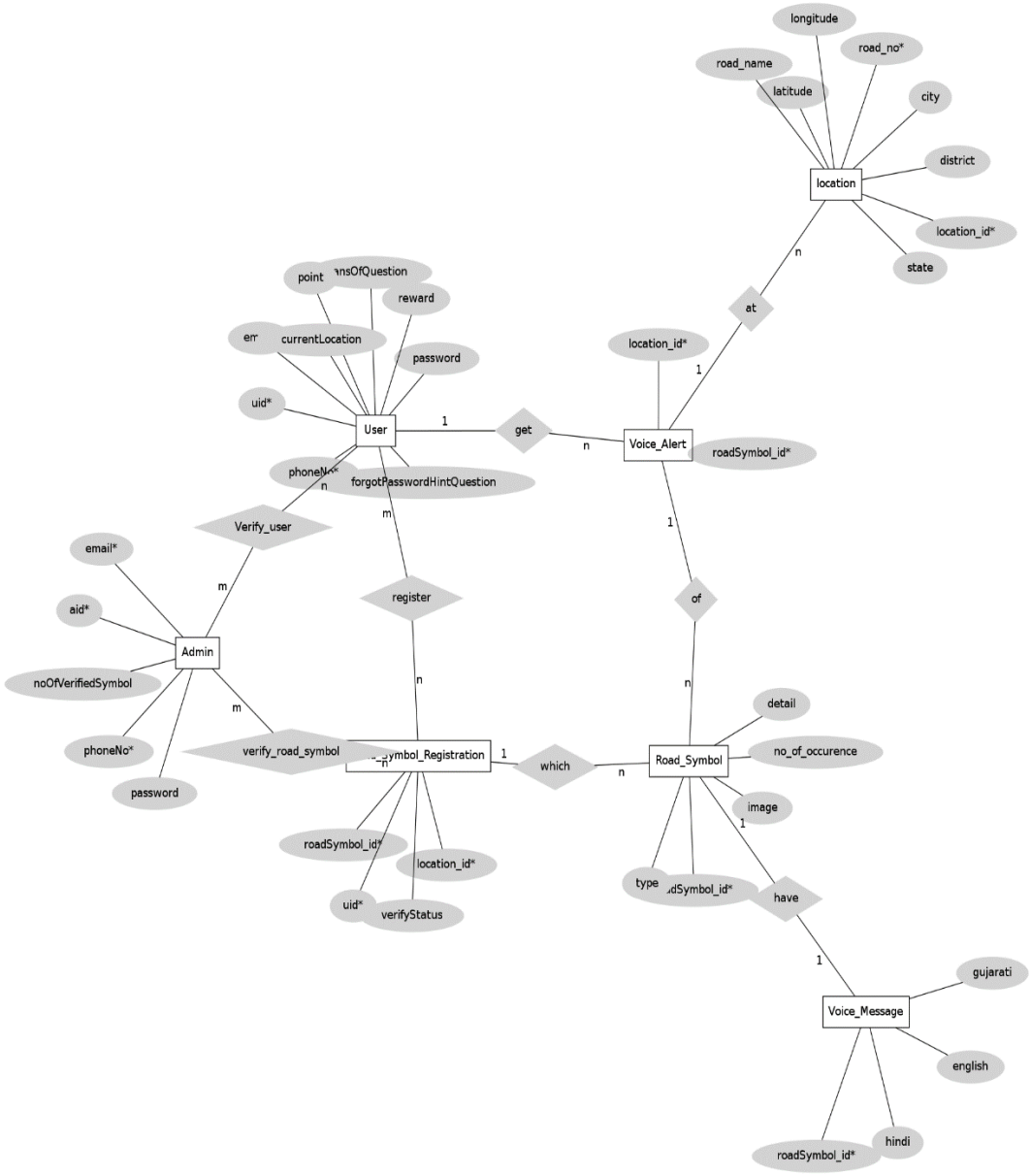
In the database design phases, data are represented using a certain data model. The data model is a collection of concepts or notations for describing data, data relationships, and data semantics and data constraints. Most data models also include set of basic operations for manipulating data in the database.

5.3.1 Class Diagram



[Figure 11: Class Diagram]

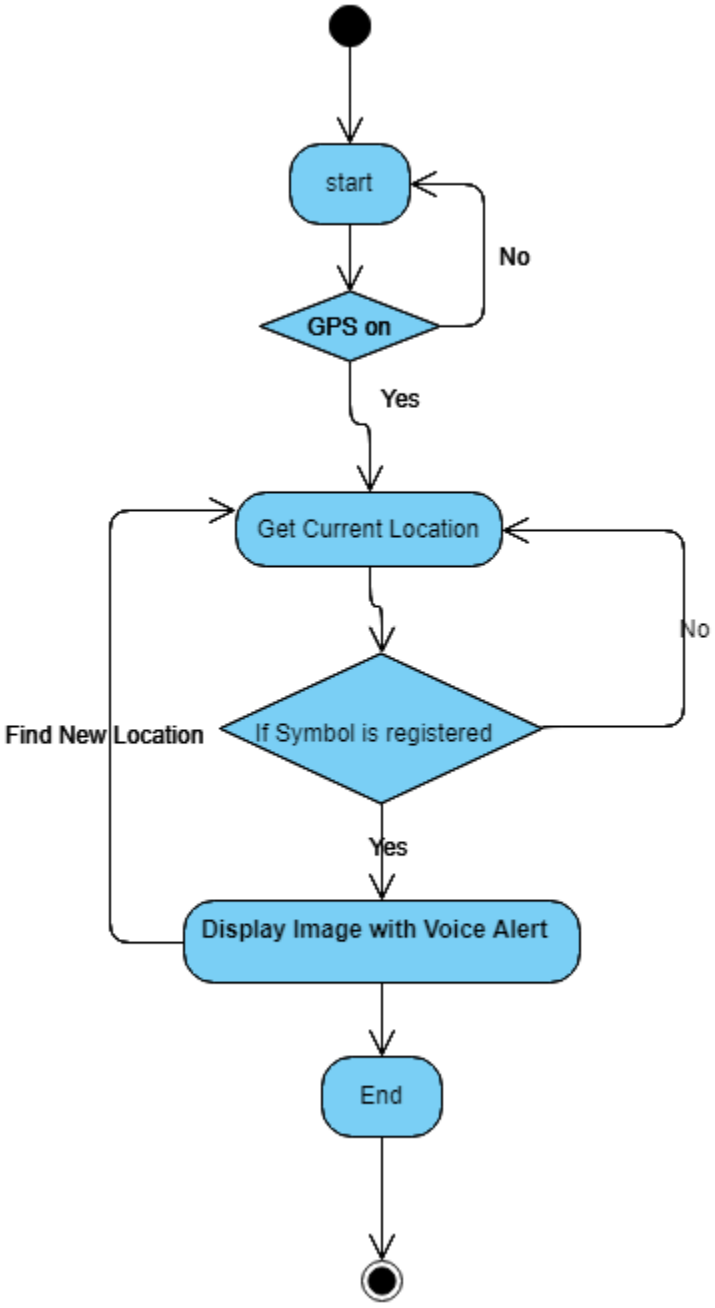
5.3.2 E-R Diagram



[Figure 12: E-R Diagram]

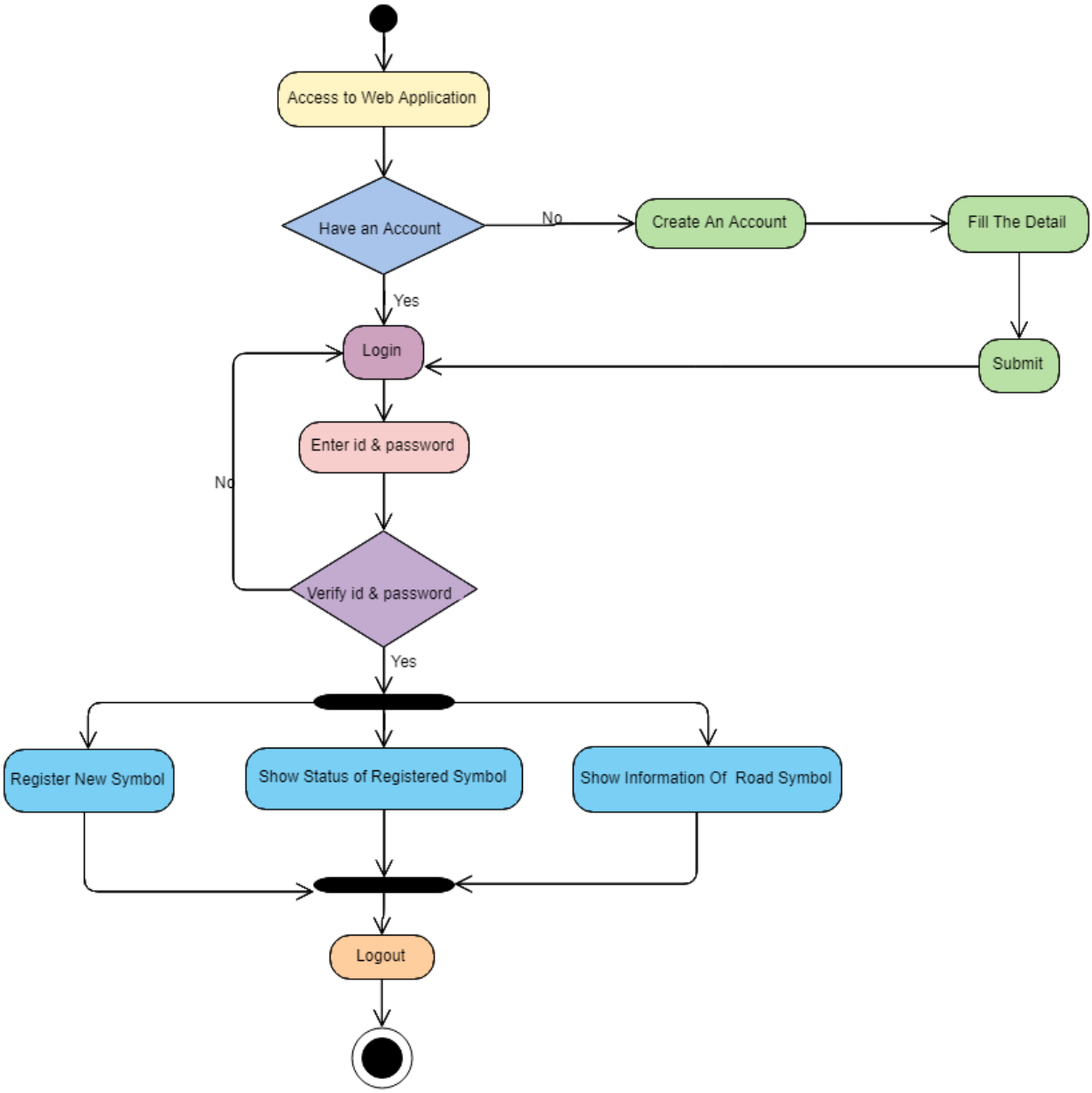
5.3.3 Activity Diagram

- **Activity Diagram of get voice alert**



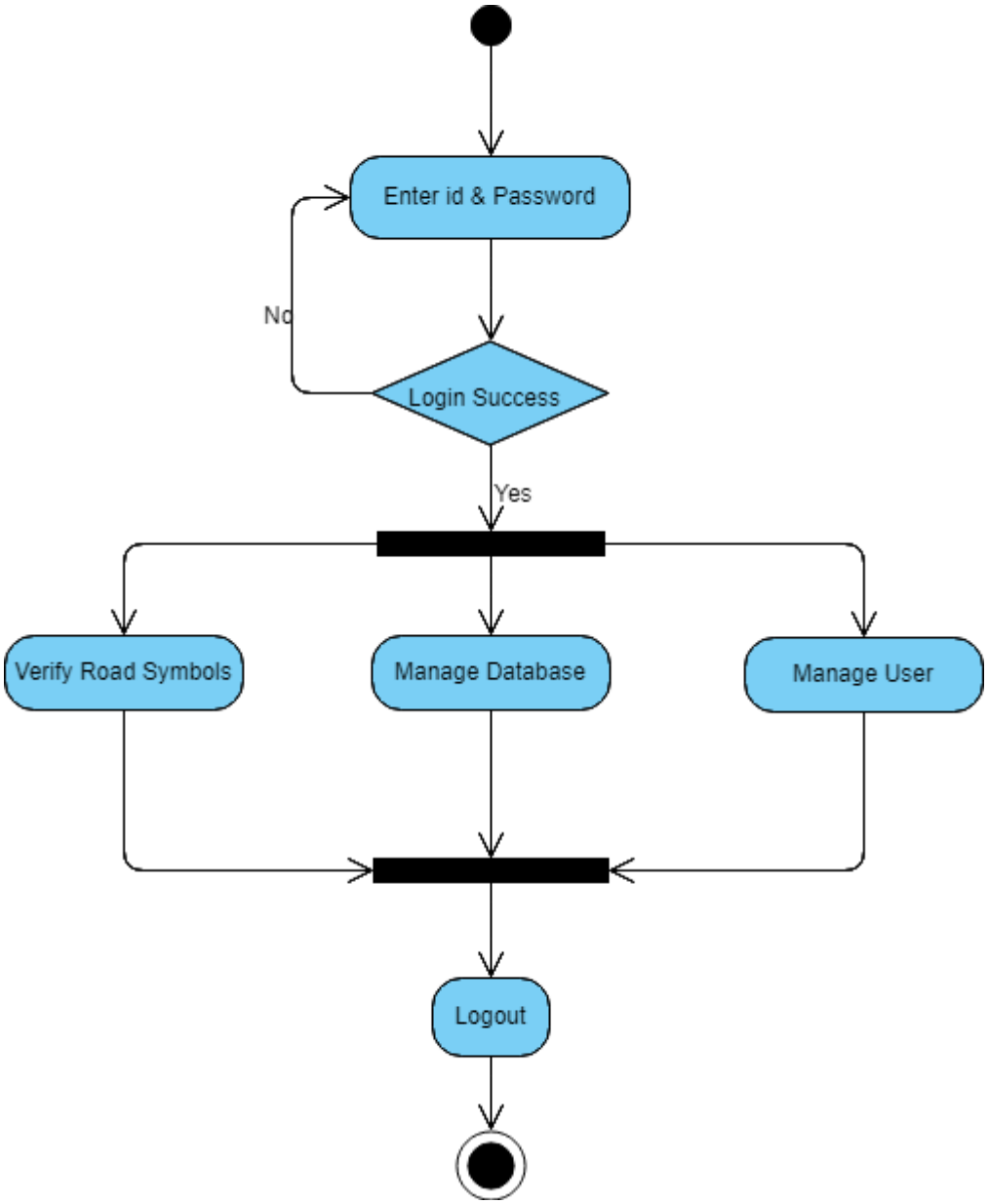
[Figure 13: Activity Diagram-1]

- **Activity Diagram at User side**



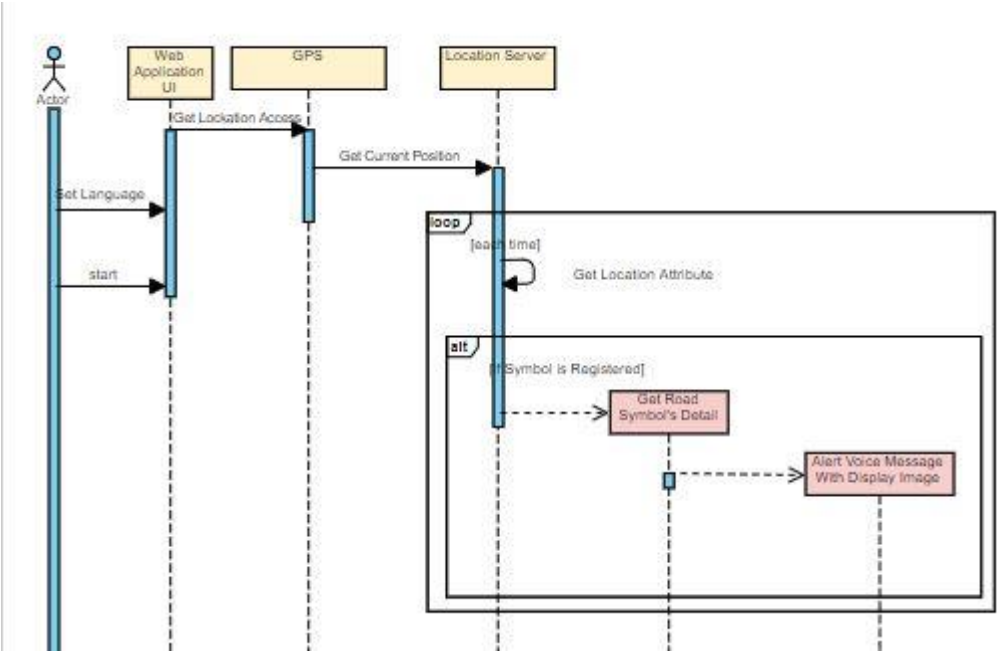
[Figure 14: Activity Diagram-2]

- **Activity Diagram at Admin side**

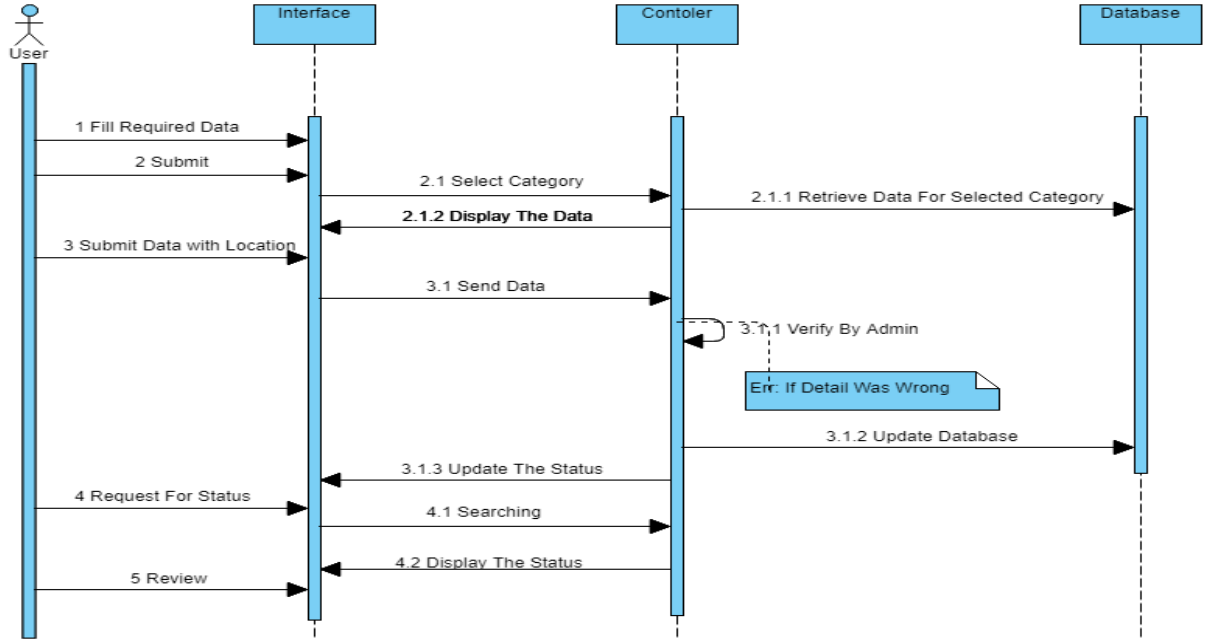


[Figure 15: Activity Diagram-3]

5.3.4 Sequence Diagram



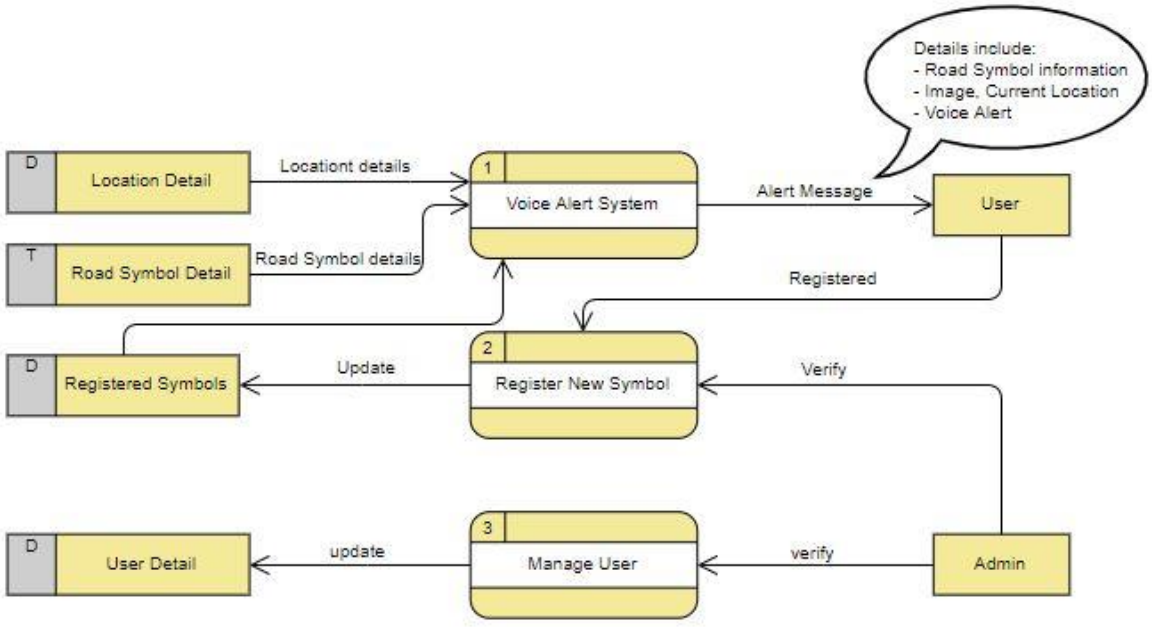
[Figure 16: Sequence Diagram-1]



[Figure 17: Sequence Diagram-2]

5.4 Functional and Behavioral Modeling

5.4.1 Data Flow Diagram



[Figure 18: Data Flow Diagram]

6. System Design

System Design is a procedure of planning a new business system or replacing an existing system by defining its components or modules to satisfy the specific requirements. Before planning, you need to understand the old system thoroughly and determine how computers can best be used in order to operate efficiently.

System Design focuses on how to accomplish the objective of the system.

System Analysis and Design (SAD) mainly focuses on –

- Systems
- Processes
- Technology

6.1 Database Schema Design

- User Detail

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	**pk_user_id**	int(11)			No	*None*	AUTO_INCREMENT
2	**user_email**	varchar(50)			No	*None*	
3	**user_mobile**	varchar(10)			No	*None*	
4	**user_password**	varchar(32)			No	*None*	
5	**user_profile_picture**	varchar(50)			No	*None*	

- Road Symbol Registration

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	**id**	int(11)			No	*None*	AUTO_INCREMENT
2	**latitude**	double			No	*None*	
3	**longitude**	double			No	*None*	
4	**fk_road_symbol**	int(11)			No	*None*	
5	**fk_user_id**	int(11)			No	*None*	
6	**status**	varchar(20)			No	*None*	
7	**date**	timestamp			No	CURRENT_TIMESTAMP	

- Road Symbol

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	pk_road_symbol_id	int(11)			No	None	AUTO_INCREMENT
2	road_symbol_name	varchar(50)			No	None	
3	fk_category_id	int(11)			No	None	
4	road_symbol_image	varchar(50)			No	None	
5	road_symbol_voice	varchar(50)			No	None	

- Road Symbol Category

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	pk_category_id	int(11)			No	None	AUTO_INCREMENT
2	category_name	varchar(30)			No	None	

- User Message

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	id	int(11)			No	None	AUTO_INCREMENT
2	fk_user_id	int(11)			No	None	
3	subject	varchar(50)			No	None	
4	message	varchar(1000)			No	None	
5	status	varchar(20)			No	None	
6	date	timestamp			No	CURRENT_TIMESTAMP	

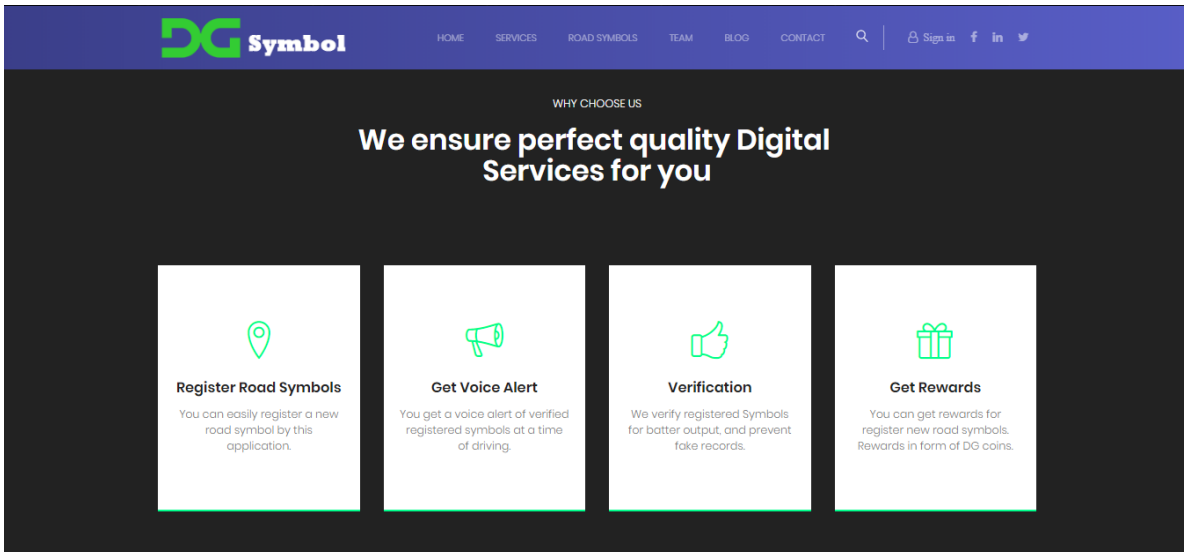
- User Coin

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	id	int(11)			No	*None*	AUTO_INCREMENT
2	fk_user_email	varchar(50)			No	*None*	
3	level	int(11)			No	*None*	
4	coin	int(11)			No	*None*	
5	total_coin	int(11)			No	*None*	

- Contact Us

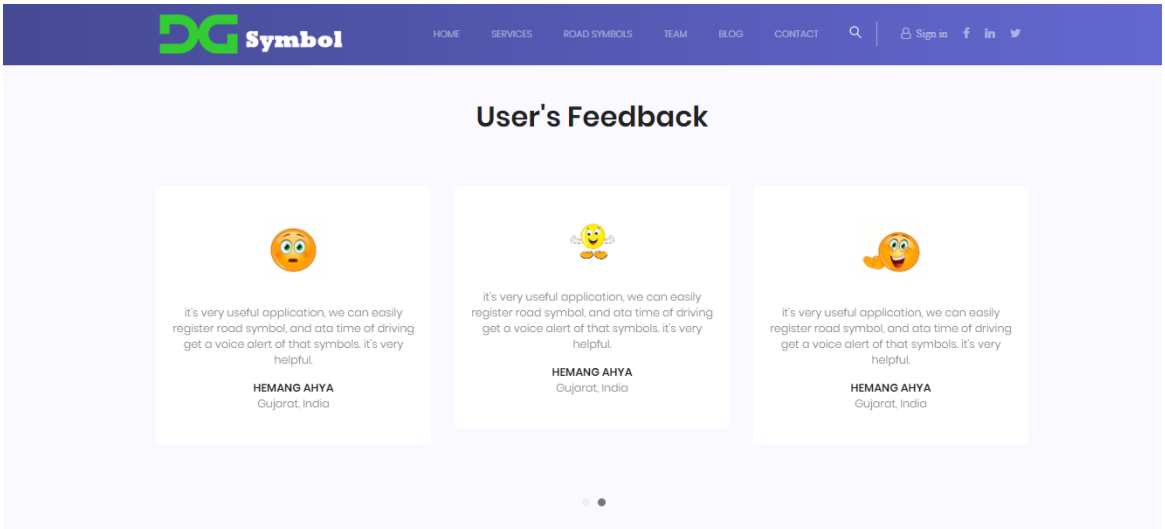
#	Name	Type	Collation	Attributes	Null	Default	Extra
1	id	int(11)			No	*None*	AUTO_INCREMENT
2	name	varchar(50)			No	*None*	
3	email	varchar(50)			No	*None*	
4	subject	varchar(60)			No	*None*	
5	message	varchar(500)			No	*None*	
6	date	timestamp			No	CURRENT_TIMESTAMP	

6.2 System Interface Design

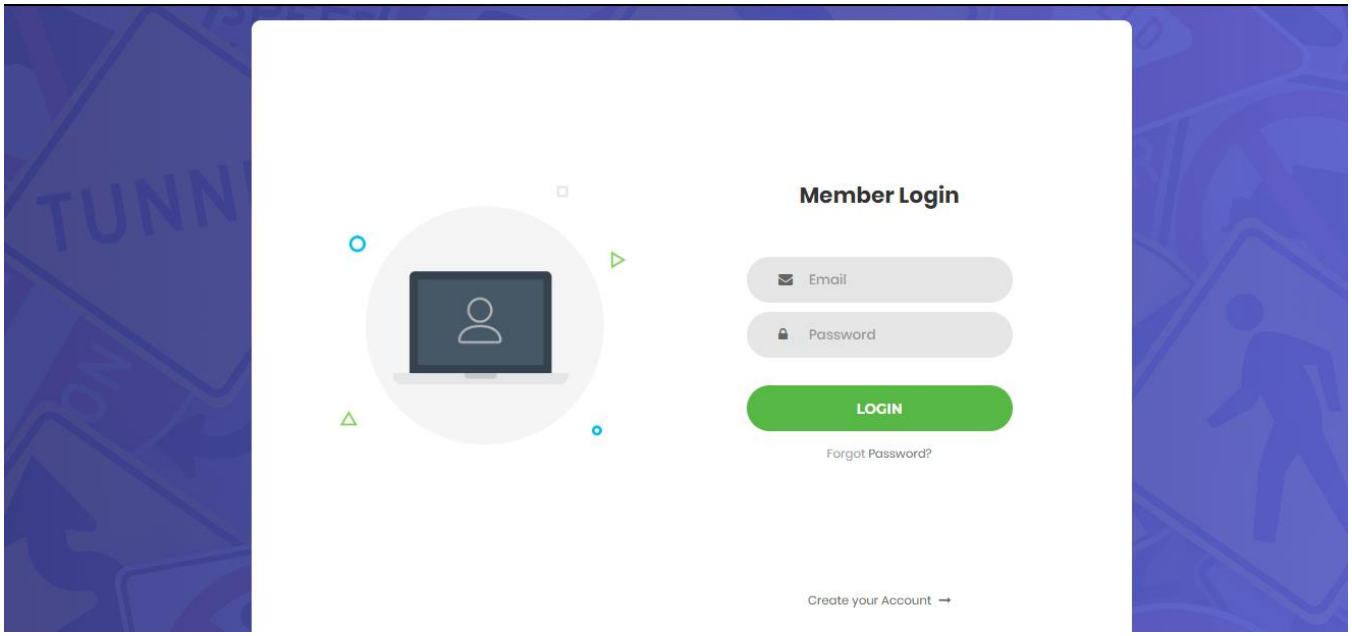


[Figure 19: UI-1]

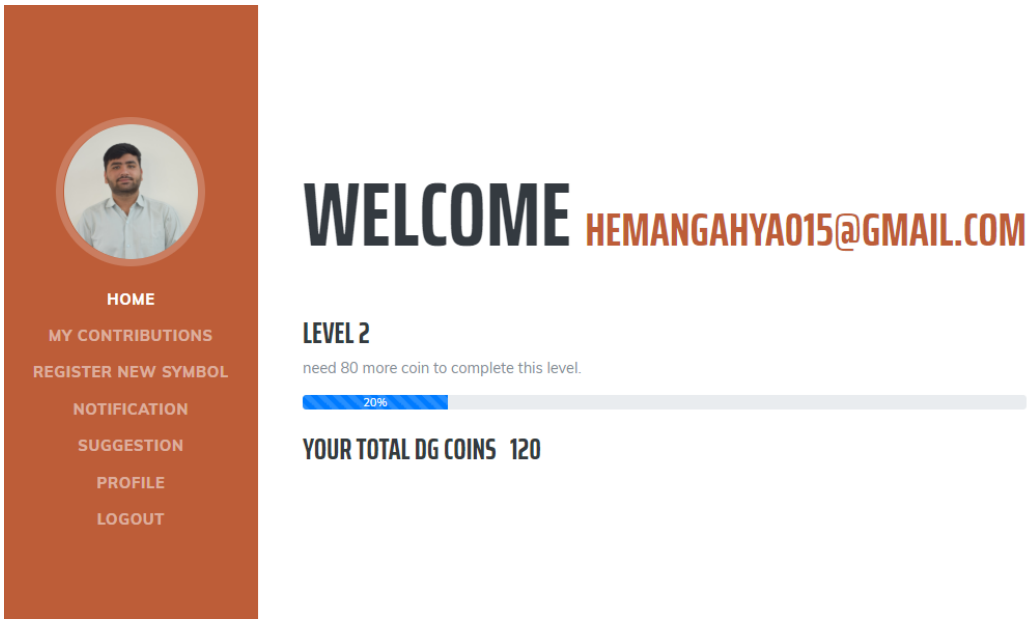
[Figure 20: UI-2]



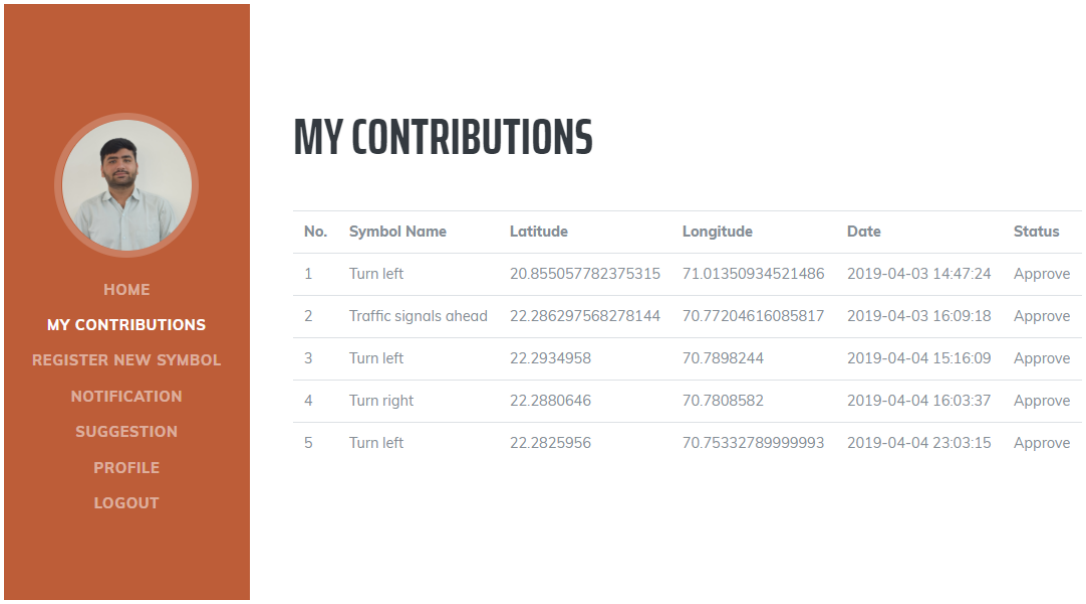
[Figure 21: UI-3]



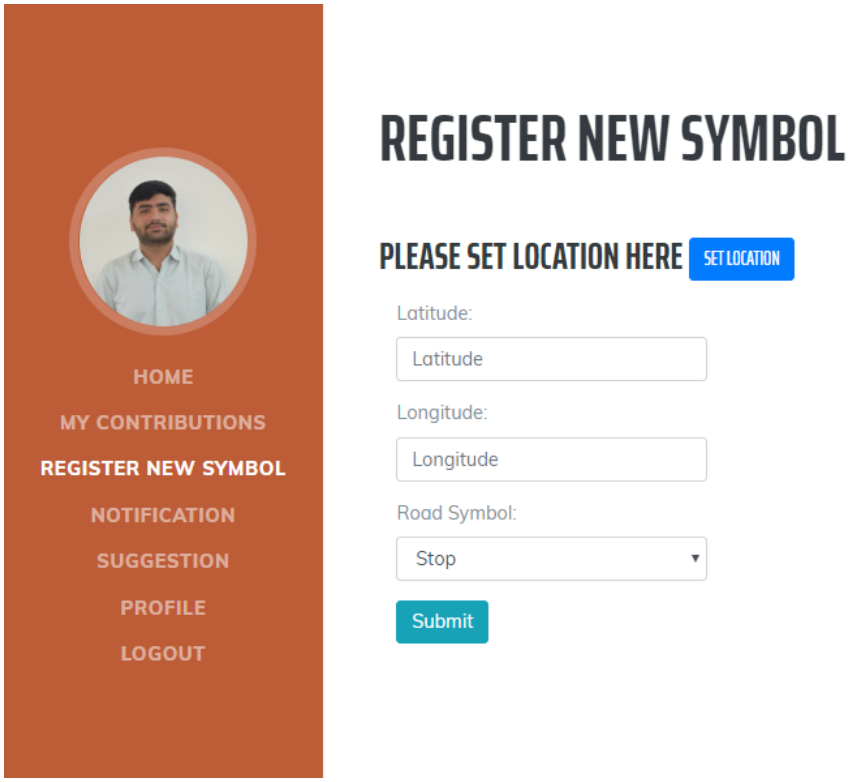
[Figure 22: UI-4]



[Figure 23: UI-5]



[Figure 24: UI-6]



[Figure 25: UI-7]

7. Conclusion & Future Work

• Conclusion

Using this system user can easily drive with voice alert of road symbols and also drive safely during the rain or fog. User also involve in this system and help to manage and update database and also give review for particular symbols at right location.

• Future Work

- Develop in Multiple Language
- Map Integration
- Make Android App
- Integration with Ministry of Road Transport & Highway
- Accuracy in Location

8. References

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