EVConnect

PROJECT REPORT

SUBMITTED BY

MIDHUN O

In partial fulfillment of the award for the degree of

BSc COMPUTER SCIENCE

In

DEPARTMENT OF COMPUTER SCIENCE

AWH SPECIAL COLLEGE, KALLAI

(AFFILIATED TO UNIVERSITY OF CALICUT)

AWH SPECIAL COLLEGE

21/10, KALLAI-CALICUT-673003

KERALA, INDIA

ACKNOWLEDGEMENT

A project of this dimension would not have been possible without the genuine help and earnest support provided to us from all sources we approached. This space would not be enough for us to mention all such people here, but that would not lessen our gratitude towards them. But it would be unfair if we to not express our sincere thanks to those people who have provided us with the greatest support and guidance.

We most sincerely appreciate and thank **Mr. Ashique** and **Mrs. Shahana**, our project guide, who helped us in all possible ways, and for their support and cooperation towards the fulfillment of the project. We express our deep sense of gratitude and sincere thanks to the Director of Bluegen Solutions for providing the necessary facilities and environment, which made this project work feasible.

We are greatly indebted to our principal **Dr. Abdul Kader** for being there as a tower of strength and pillar of support. We most obediently express our thanks to him. We thank our Head of the Department, **Mrs.Sheena Bhaskar** from the bottom of our hearts. We cordially thank you for the support and help given to us by **Mrs. Daniya**, who coordinated us well through the project creation.

Last but not the least, we thank our family and friends. Without whom's moral and emotional support, this project would not have materialized. They have been instrumental in keeping our confidence level high and hopes alive.

MIDHUN O

SYNOPSIS

The "EV Charging Solutions" project aims to create a user-friendly platform called "EVConnect" that simplifies the process of finding reliable and convenient charging stations for electric vehicle (EV) owners. By providing a comprehensive database of charging stations, EVConnect reduces range anxiety and encourages more people to adopt EVs, which have lower emissions and are more energy-efficient. EVConnect also benefits charging station operators by increasing the visibility and utilization of their stations and creating new business opportunities. Overall, EVConnect aims to make electric vehicle charging more accessible and convenient, thus promoting the use of sustainable transportation and reducing environmental impact

AWH SPECIAL COLLEGE, KALLAI 673003

BONAFIDE CERTIFICATE

Certified that this project report "**EVConnect**" is the bonafide work of **MIDHUN O (ASAUSCS015)** who carried out the project work under my guidance and supervision.

Mrs. DANIYA D. K
Guide Department
Lecturer in Computer Science
Department of Computer Science
AWH Special College
Kallai- 673003

Mrs. SHEENA BHASKAR
Head of the Department
Department of Computer Science
AWH Special College
Kallai- 673003

External Examiner

INDEX

SECTION	TITLE	PAGE NO.
1	**INTRODUCTION**	**1**
1.1	OVERVIEW OF THE PROJECT	2
1.2	MAIN OBJECTIVE	3
2	**SYSTEM ANALYSIS**	**4**
2.1	REQUIREMENT SPECIFICATIONS	6
2.2	SYSTEM REQUIREMENT SPECIFICATION	7
2.3	OVERVIEW OF PYTHON	8
2.4	OVERVIEW OF MySQL	9
2.5	OVERVIEW OF PyCham	9
2.6	OVERVIEW OF APACHE	10
2.7	OVERVIEW OF DJANGO	11
2.8	FEASIBILITY STUDY	12
3	**SYSTEM DESIGN**	**14**
3.1	MODULE DESIGN	15
3.2	INPUT DESIGN	18
3.3	OUTPUT DESIGN	18
3.4	DATA FLOW DIAGRAM	19
3.5	ER DIAGRAM	24
3.6	DATA BASE DESIGN	25
4	**SYSTEM TESTING**	**32**
4.1	TESTING	33
5	**SYSTEM IMPLEMENTATION**	**35**
5.1	USER TRAINING	36
5.2	SYSTEM MAINTENANCE	38
6	**SCREENSHOTS**	**38**
7	**CONCLUSION**	**45**
8	**FUTURE ENHANCEMENTS**	**47**
9	**BIBLIOGRAPHY**	**49**

INTRODUCTION

1. INTRODUCTION

1.1 OVERVIEW OF THE PROJECT

The EV Charging Solutions project aims to provide a comprehensive platform for electric vehicle (EV) owners to manage their charging need.The primary reason why people don't prefer electric vehicles is because of the unavailability of charging stations. Charging stations, unlike petrol bunks, aren't available everywhere. There always exists a fear as to what might happen if the vehicle runs out of battery. People are worried about more straightforward and faster commuting methods in our country rather than saving the Earth from the ill effects caused by pollution. The project mainly deals with a simple solution to make charging stations more accessible.

1.2 MAIN OBJECTIVE

Electric vehicles (EVs) are becoming increasingly popular due to their many advantages over traditional gasoline-powered vehicles. EVs have lower emissions and are more energy-efficient, which helps to reduce air pollution and greenhouse gas emissions. Additionally, electric cars are often quieter, smoother, and more responsive than traditional vehicles.

However, one of the biggest challenges for EV owners is finding reliable and convenient charging stations. This is where EVConnect comes in. EVConnect is a user-friendly platform that makes it easy for electric vehicle owners to find nearby charging stations, pay for their use, and receive emergency charging services if needed. By providing a comprehensive database of charging stations, EVConnect takes the guesswork out of finding a charging station and helps to reduce range anxiety for EV owners.

Furthermore, EVConnect also benefits charging station operators by providing them with a platform to register their stations and make them available to the growing community of EV owners. This not only helps to increase the visibility and utilization of charging stations but also creates new business opportunities for station operators.

SYSTEM ANALYSIS

2. SYSTEM ANALYSIS

System analysis is a detailed study of the various operations performed by a system and their relationships within and outside the system .First of all the existing system is studied to decide the extent of performance that is fixing up the boundaries .It involves establishing requirements for all system elements and then mapping these requirements to software forms .The analysis encompasses requirements, getting at the system level with a small number of top-level designs. During analysis, a great deal of relatively unstructured data is collected through interviews.

Overall, system analysis in a project report plays a critical role in ensuring the success of the project by helping project managers and stakeholders to identify problems, propose solutions, and optimize the project's performance. By analyzing the system or organization thoroughly, system analysis provides valuable insights that can inform decision-making and ensure that the project meets its objectives.

2.1 REQUIREMENT SPECIFICATIONS

2.1.1 EXISTING SYSTEM

Nowadays, the road is ruled by vehicles which use fossil fuels. These vehicles are extremely dangerous to the environment. Fossil fuels are not regenerative energy. The need for electric vehicle is huge. EV users face it difficult to find charging stations as they are not popular right now. There are fear among users whether they might go out of charge on the road. There is a lack of platform which they can overcome this issue. Now most of the stations use their own platform. It creates difficulty for users to carry multiple platforms for each station. There is no integrated platform for EV stations, users, delivery boys, and service centers to manage the various functionalities.

2.1.2 PROPOSED SYSTEM

The proposed system is an integrated platform for EV station and service management that aims to provide a seamless and efficient experience for users and service providers. The proposed system offers features such as location-based search, online booking, wallet management, and automatic charging using IoT technology. With the proposed system, users can enjoy a hassle-free experience of finding charging stations and getting their EVs serviced, while EV station and service center owners can efficiently manage their businesses.The proposed system aims to revolutionize the EV station and service industry by providing a comprehensive and user-friendly solution that facilitates efficient management for service providers while ensuring a seamless experience for users.

2.2 SYSTEM REQUIREMENT SPECIFICATION

The following requirements are only the minimal requirements to run this project more successfully and efficiently.There should be sufficient memory and software tools for efficient processing.

2.2.1 HARDWARE REQUIREMENT

- Processor : i3 or above
- System Bus : 32Bit or 64Bit
- RAM : 4 GB or Above
- HDD : 500 GB or Above
- Monitor : 14” LCD or Above
- Keyboard : 108 Keys
- Mouse : Any type of mouse
- Mobile : Android supported mobile phone

2.2.2 SOFTWARE REQUIREMENT

- Operating system : Windows 10 Any 32 bit or 64 bit
- Front end : HTML, CSS, JavaScript
- Back end : Python
- Database Server : MySQL
- IDE : PyCharm
- Web server : Apache
- Framework : Django
- Web browser : Microsoft Edge, Google Chrome etc.

2.3 OVERVIEW OF PYTHON

Python is a high-level, general-purpose programming language that is widely used for developing various applications. It was first released in 1991 by Guido van Rossum and has since then become one of the most popular programming languages due to its simplicity, flexibility, and versatility. Python is an interpreted language, which means that the code is executed line by line, without the need for compilation.

One of the key features of Python is its ease of use. It has a simple and straightforward syntax, which makes it easy for beginners to learn and use. Additionally, Python has a large standard library that includes modules for a wide range of tasks, such as web development, scientific computing, data analysis, machine learning, and more.

Python also supports object-oriented programming (OOP) and functional programming paradigms. In OOP, the code is organized into objects, which can be defined with attributes and methods. In functional programming, the focus is on writing functions that take input and produce output, without changing the state of the program.

- **Python is Interpreted** – Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PHP.
- **Python is Interactive** – You can sit at a python prompt and interact with the interpreter directly to write your program
- **Python is Object-Oriented** – Python supports an Object Oriented style or technique of programming that encapsulates code within objects
- **Python is a Beginner's Language** – Python is a great language for beginner-level programmers and supports the development of a wide range of applications from, simple text processing to WWW browsers to games

2.4 OVERVIEW OF MySQL

MySQL is an open-source relational database management system that stores data in tables and allows multiple users to access and manage it. It provides a secure and scale-able solution for storing and retrieving data in various applications. MySQL supports multiple platforms, making it a popular choice for web applications, data warehousing, and e-commerce. It also offers features such as transactions, indexing, and clustering for improved performance and data integrity. With its easy installation and configuration, MySQL is widely used in small and large-scale applications alike.

2.5 OVERVIEW OF PyCharm

PyCharm is an integrated development environment (IDE) for the Python programming language that is widely used by developers for coding, testing, and debugging their applications. It provides a user-friendly interface and offers a range of features such as code completion, syntax highlighting, refactoring, and debugging tools. PyCharm also supports various web development frameworks, including Django and Flask, making it an excellent choice for web application development. The IDE offers integration with version control systems such as Git and Mercurial, enabling users to collaborate with others on projects. Additionally, PyCharm provides built-in support for unit testing and virtual environments, which helps developers to streamline their workflow and ensure the quality of their code. Overall, PyCharm is a powerful and efficient tool that makes Python development easier and more productive.

2.6 OVERVIEW OF APACHE

Apache is a free, open-source web server software that is used to deliver web pages on the internet. It is one of the most popular web servers and is widely used for hosting websites. The software is maintained and developed by the Apache Software Foundation, and it is available for a wide range of operating systems, including Windows, Linux, and macOS.

Apache supports several programming languages and technologies, such as PHP, Python, Perl, Ruby, and MySQL. It also supports a wide range of modules, which enable users to customize the server and add features to it as per their requirements.

One of the key advantages of Apache is its modularity and flexibility. It can be configured to work with different modules, making it adaptable to different environments and scenarios. It is also highly scale-able, allowing it to handle large volumes of traffic and users.

Apache provides a range of security features such as SSL/TLS encryption, password protection, and access control. It also offers logging and monitoring capabilities that enable users to keep track of server activity and identify potential issues.

Overall, Apache is a robust and reliable web server that is widely used by businesses and individuals for hosting websites and web applications. Its flexibility, scalability, and security features make it a popular choice for web hosting.

2.7 OVERVIEW OF DJANGO

Django is a high-level, open-source web framework written in Python. It is designed to simplify the process of building complex, database-driven websites and web applications. Django was first released in 2005 and has since gained a large and active community of developers.

One of the core features of Django is its Model-View-Controller (MVC) architecture, which separates the data model, user interface, and application logic. This makes it easier to build maintainable and scale-able web applications. Django also provides a powerful Object-Relational Mapping (ORM) system that enables developers to work with databases using Python classes and objects, rather than raw SQL queries.

Another notable feature of Django is its built-in administration interface, which provides a convenient way to manage the data in the database. Additionally, Django provides a robust authentication system that handles user authentication, permissions, and security out of the box.

Django is designed to be modular and extensible, with a large number of third-party packages and plugins available for integrating additional functionality into your web application. Django's templating system also makes it easy to create reusable UI components that can be shared across different views.

Overall, Django is a powerful and flexible web framework that can help you build complex web applications quickly and efficiently. Its emphasis on best practices, modularity, and extensibility makes it a popular choice for web developers worldwide.

2.8 FEASIBILITY STUDY

The key conditions involved in the feasibility analysis are:

- **Economical Feasibility**
- **Operational Feasibility**
- **Technical Feasibility**

2.8.1 ECONOMICAL FEASIBILITY

Economical feasibility analysis is the most frequently used evaluating technique for the effectiveness of the candidate system. These checks are sufficient benefits in creating the system to make cost acceptable. In the case of the proposed system, it is very necessary to implement in such a firm and when its necessity compared, its cost for implementing is very low and it is very acceptable by the users of the system. When its advantages and efficiency are evaluated, it is economically feasible.

Economic feasibility of the **EVConnect** project is positive due to the growing demand for electric vehicles and the increasing need for reliable and convenient charging stations. The platform will generate revenue through transaction fees for charging and emergency charging services, as well as through partnerships with charging station operators for listing their stations on the platform. The initial investment in development and marketing will be offset by the potential for a high return on investment, given the growth potential of the electric vehicle market. The cost of maintaining and updating the platform will need to be factored in, but the revenue generated from transaction fees and partnerships is expected to exceed these costs. Overall, the **EVConnect** project has strong economic feasibility and potential for growth in the future.

2.8.2 OPERATIONAL FEASIBILITY

Operational feasibility is the measure of how well a proposed system solves the problems and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development.

The Operational feasibility assessment focuses on the degree to which the proposed development project fits in with the existing business environment and objectives concerning the development schedule, delivery date, corporate culture, and existing business processes.

In the case of the **EVConnect** platform, operational feasibility is high due to the availability of necessary resources and technologies. The system is designed using modern software technologies such as Python, Django, HTML, CSS, and Bootstrap, which are widely used and well-supported in the development community. The platform is also highly scale-able and can be easily adapted to accommodate future expansion and growth.

2.8.3 TECHNICAL FEASIBILITY

Technical feasibility study accesses the details of how you intend to deliver a product or service to customers. Think materials, labour, transportation, where your business will be located, and the technology that will be necessary to bring all this together.

Technical feasibility of the EVConnect project is high. The technologies used to build the platform, such as mobile app development, web development, are well-established and widely used. Additionally, the necessary hardware components, such as charging stations and IoT devices, are readily available in the market. The team responsible for the development of the platform has the necessary technical skills and experience to handle the project's complexities. Furthermore, the platform's scalability and maintainability are achievable, with the use of modern software development practices. Overall, the technical feasibility of the EVConnect project is high, and the platform can be developed and deployed with reasonable effort and resources.

SYSTEM DESIGN

3.SYSTEM DESIGN

System design is the process of developing a candidate system that meets the criteria established in system analysis. User requirements are translated into systems characteristics during system design. System design involves firstly the logic design and then physical construction of the new system. The logical design describes the detailed specifications for the new system, the new input / output, files and databases, procedures, all in a manner that must be project requirement. Physical construction, the activity following design, produces software files and a working system.

3.1 MODULE DESIGN

This project is divided into 5 modules , which are:

1) **ADMIN**
2) **USER**
3) **STATION**
4) **DELIVERY BOY**
5) **SERVICE CENTER**

3.1.1 ADMIN

- Login
- Manage EV Stations
- Manage service centers
- Manage Delivery Boy
- View Reports
- View Feedback

3.1.2 USER

- Login
- Register
- EV Trip planner
- View Charging Stations
    - Nearby Search
    - Search by Location
- View Wallet
    - View Balance
    - Recharge Wallet
    - View Transactions
- Charging
    - Scan QR code
    - Select amount or time
    - Payment : Automatic charging using IOT
    - View status
- Request Emergency charge
- View battery swapping hubs
    - Select hub
    - View available batteries
- View Nearby Service center
    - View available services
    - Enquire about Services
    - View Reply
- Post Review
- View Reviews
- Post Complaint
- View Reply

3.1.3 STATION

- Login
- Register
- Manage Battery Hubs
  - Update available batteries
- View wallet
- Manage Delivery Requests
  - View delivery Requests
  - Assign work to delivery boy
- View Reviews

3.1.4 DELIVERY BOY

- Login
- Register
- View assigned work
- Update assigned work

3.1.5 SERVICE CENTER

- Login
- Register
- Manage services available
- View Enquiry
- Reply to Enquiry

3.2 INPUT DESIGN

Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system

The objectives of input design are:

- To design data entry and input procedures
- To reduce input volume
- To design source documents for data capture or devise other data capture methods
- To design input data records, data entry screens, user interface screens, etc.
- To use validation checks and develop effective input controls.

3.3 OUTPUT DESIGN

The output designs are the most important task of any system. During output design, developers identity the type of outputs needed, and consider the necessary output controls and prototype report layouts. Design outputs describe all the components, parts, and pieces that go into your medical device. Design inputs describe all assemblies and sub assemblies of your product.

The objectives of input design are:

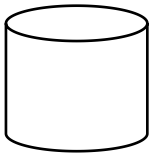
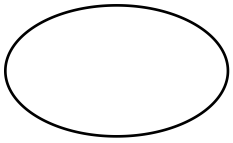
- To develop an output design that serves the intended purpose and eliminates the production of unwanted output.
- To develop an output design that meets the end user's requirements.
- To deliver the appropriate quantity of output.
- To form the output in an appropriate format and direct it to the right person.

3.4 DATA FLOW DIAGRAM

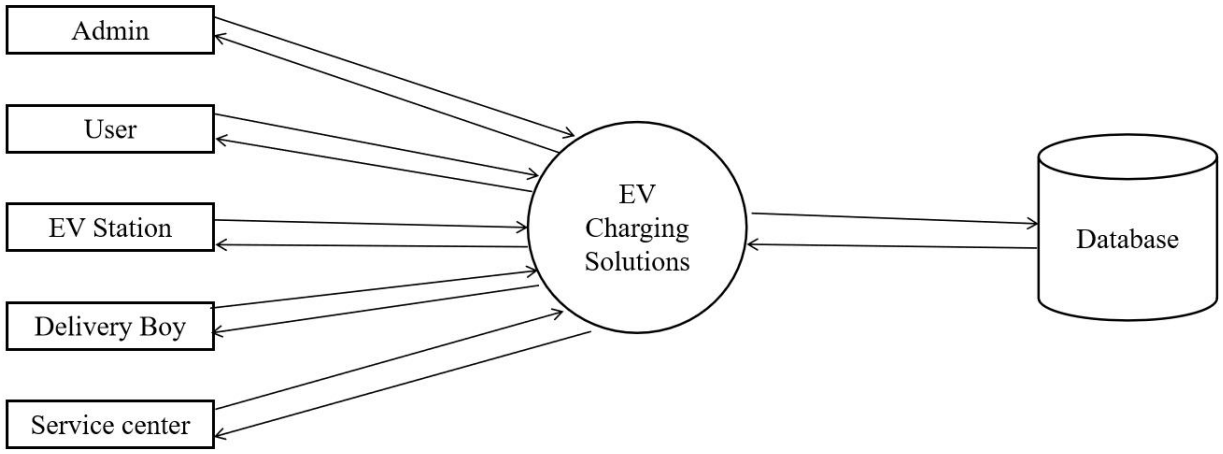
The **Data Flow Diagram** (DFD) is one of the most important tools used by system analysts. Data flow diagrams are made up of a number of symbols, which represent system components. Most data flow modeling methods use four kinds of symbols. These symbols are used to represent four kinds of system components. Processes, data source, data flows and external entities. Processes are represented by circles in DFD. Data flow is represented by a thin line in the DFD and each data store has a unique name and a square or rectangle represents external entities. Unlike detailed charts, Data flow diagrams do not supply detailed descriptions of the modules but graphically describe a system's data and how the data interacts with the system.

Five rules for constructing a data flow diagram:

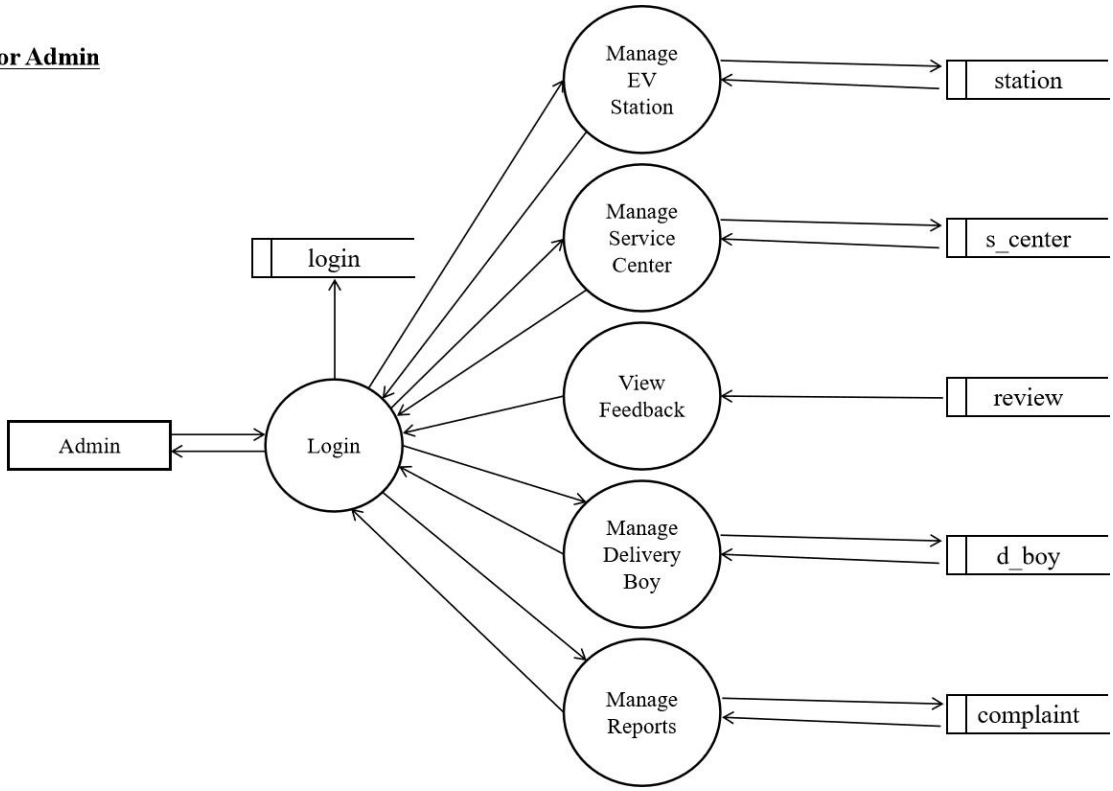
- Arrows should not cross each other
- All symbols must be named
- Choose meaningful names for data flow
- Draw all the data flows around the outside of the diagram
- Decomposed data flow squares and circles can have the same names

SYMBOL	DESCRIPTION
	Represents the database which is the data source or destination
	Represent tables
	Represents the flow of data that is a data stream
	Represents a process that transforms data
	Represents an organization that sends data to or data from the system

Level 0

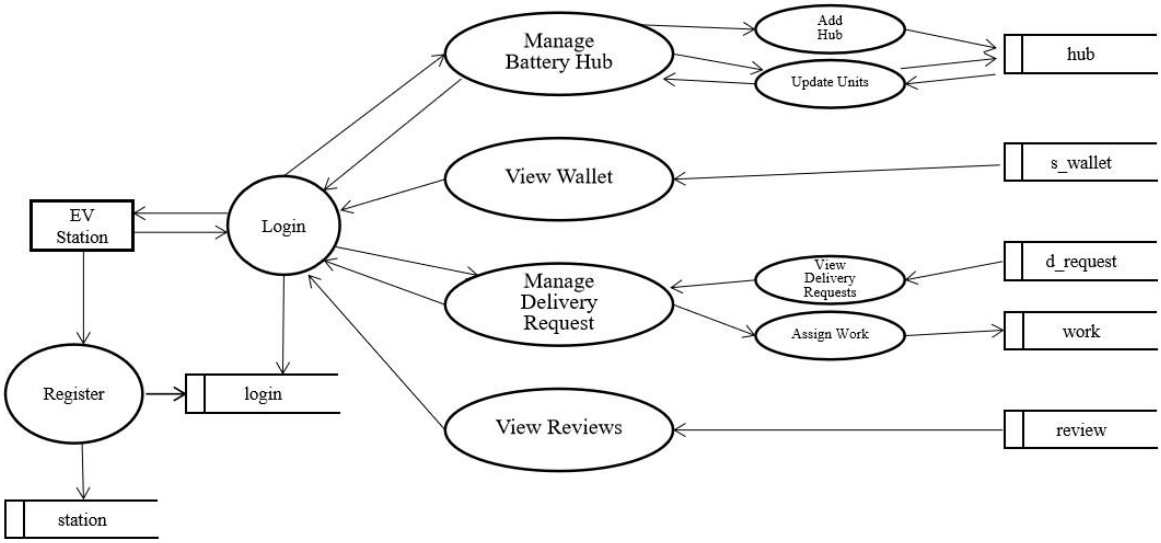


Level 1 for Admin

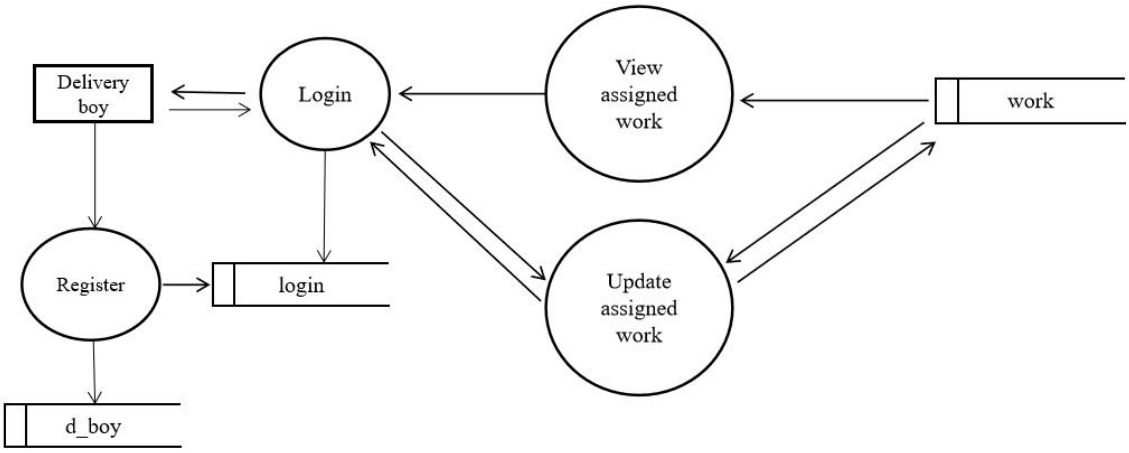


Level 1 for User

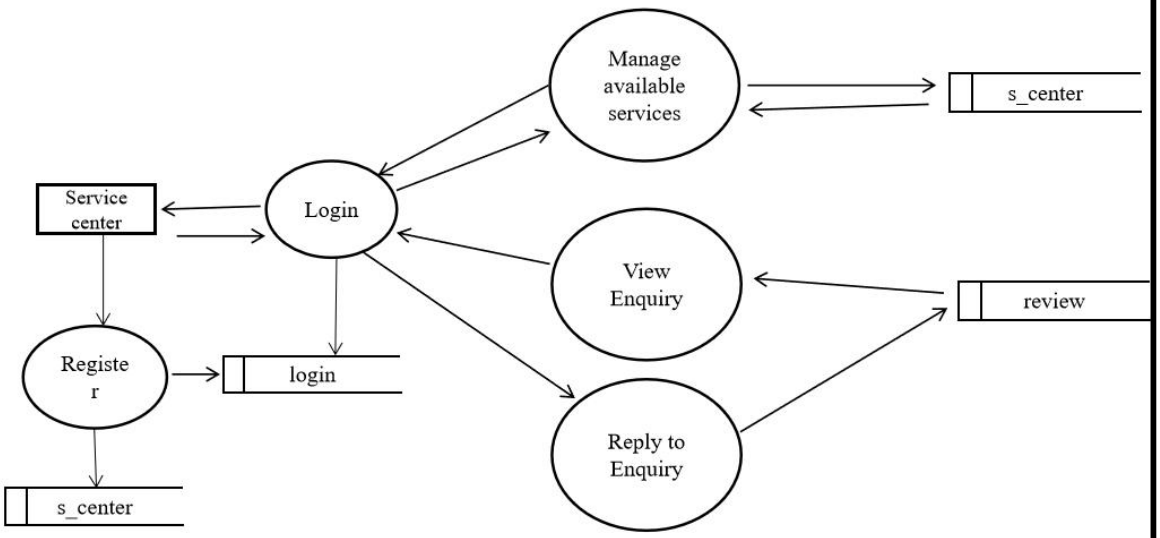
Level 1 for EV Station



Level 1 for Delivery boy

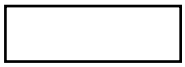
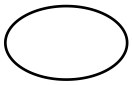
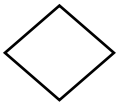


Level 1 for Service center

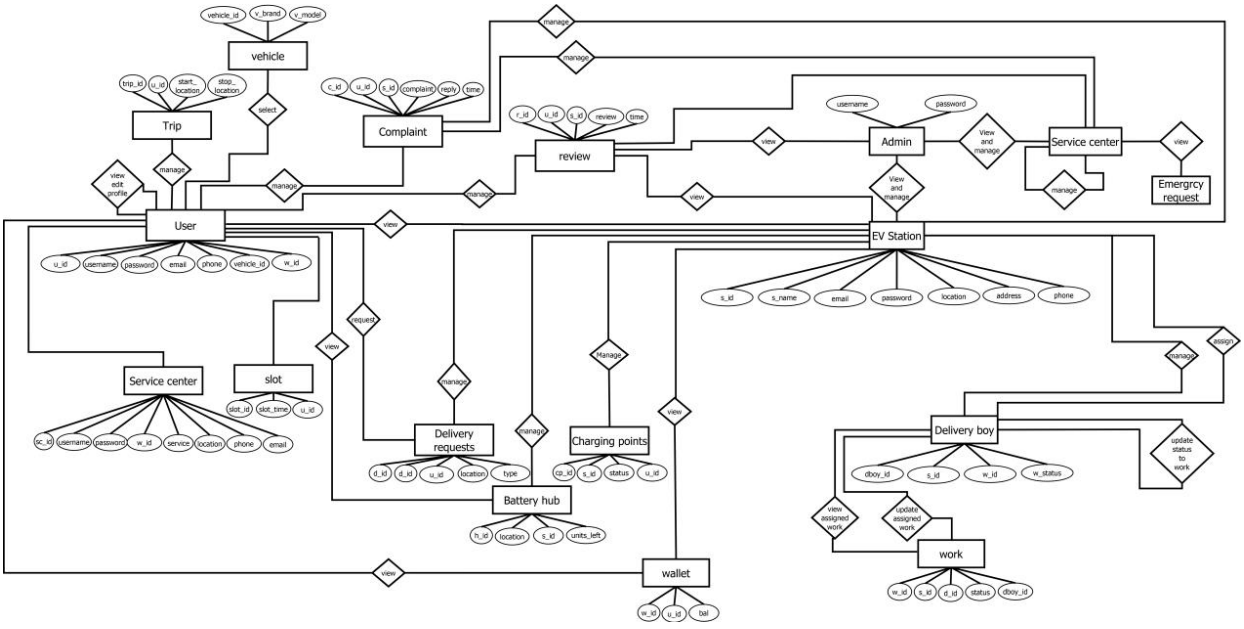


3.5 ER DIAGRAM

ER-modeling is a data modeling method used in software engineering to produce a conceptual data model of an information system. Diagrams created using this ER-modeling method are called Entity-Relationship Diagrams or ER diagrams or ERDs.

SYMBOL	DESCRIPTION
	Represent Entity
	Used to link attributes to entity
	Represents attributes of an Entity
	Represents relationship

ER DIAGRAM OF EV CHARGING SYSTEM



3.6 DATA BASE DESIGN

Database design is the organization of data according to a database model. The designer determines what data must be stored and how the data elements interrelate. With this information, they can begin to f the data into the database model, Database management system manages the data accordingly. The data to be stored in the database must be determined in cooperation with a person who does have operators in that domain, and who is aware of what data must be stored within the system. Once a database designer is aware of the data which is to be stored within the database, they must then determine where dependency is within the data. When provided a name and the list the address can be uniquely determined. When given an address and the list, a name cannot be uniquely determined because multiple people can reside at an address. Because an address is determined by a name, and address is considered dependent on a name.

Once the relationships and dependencies among the various pieces of information have been determined, it is possible to arrange the data into a logical structure which can then be mapped into the storage objects supported by the database management system. In the case of relational databases, the storage objects are tables that store data in rows and columns. In an Object database, the storage objects correspond directly tothe objects used by the Object-oriented programming language used to write the applications that will manage and access the data. The relationships may be defined as attributes of the object classes involved or as methods that operate on the object classes. Each table may represent an implementation of either a logical object or a relationship joining one or more instances of one or more logical objects. Relationships between tables may then be stored as links connecting child tables with parents. Since complex logical relationships are themselves tables they will probably have links to more than one parent. Normalization is the process of organizing data in a database. This includes creating tables and establishing relationships between those tables according to rules designed both to protect the data and to make the database more flexible by eliminating redundancy and inconsistent dependency.

NORMALIZATION

Normalization is a systematic way of ensuring that a database structure is suitable for general-purpose querying and free of certain undesirable characteristics-insertion, update, and deletion anomalies that could lead to loss of data integrity. A standard piece of database design guidance is that the designer should create a fully normalized design. The more normalized the design is, the less data redundancy there is (and therefore, it takes up less space to store). Document databases take a different approach. A document that is stored in such a database typically contains more than one normalized data unit and often the relationships between the units as well. If all the data units and the relationships in question are often retrieved together, then this approach optimizes the number of retrieves. It also simplifies how data gets replicated because now there is an identifiable unit of data whose consistency is self-contained .Some modeling disciplines, such as the dimensional modeling approach to data warehouse design. Explicitly recommend non-normalized designs, is designs that in large part do not adhere to 3NF normalization , consist of normal forms that are:

- First Normal Form(INF)
- Second Normal Form (2NF)
- Third Normal Form(NF)

First Normal Form

A relation is said to be in 1NF when each table column hold indivisible values, eliminating redundancy and improving data integrity in databases.

Second Normal Form

A relation is said to be in 2NF if and only if satisfies all INF conditions for the primary key and every on-primary key attribute of the relation is fully dependent on its primary key alone. If a non-key attribute is not dependent on the key, it should be removed from the relation and placed as a separate relation i.e. the fields of the table in 2NF are all related to primary key

Third Normal Form

A relation is said to be in 3NF if only it is in 2NF and more over non-key attributes of the relation should not depend on other non-key attributes. The data in the system has to be stored and retrieved from the database

3.6.1 TABLE DESIGN

A table is made up of rows and columns. A row is also called a record for tuple). A column is also called a field (or attribute). A database table is similar to a spreadsheet. However, the relationships that can be created among the tables enable a relational database to efficiently store huge amounts of data, and effectively retrieve selected data.

Database design is the organization of data according to a database model. The designer determines what data must be stored and how the data elements interrelate.With this information, they can begin to It the data to the database model. A database management system manages the data accordingly.

Database diagrams graphically show the structure of the database. Using database diagrams, you can create and modify tables, columns, relationships, and keys. Additionally, you can modify indexes and constraints .

The objectives of creating a table are. Eliminate Data Redundancy: the same piece of data shall not be red in more than one place. This is because duplicate data not only waste storage spaces but also easily leads to inconsistencies, Ensure Data Integrity and Accuracy.

Gather the requirements and define the objective of your database Gather the data that are needed to be stored in the database. Divide the data into subject-based tables. Choose one column (or a few columns) as the so-called primary key, which uniquely identifies each of the rows.

Table 1 : login			
Field Name	**Data Type**	**Size**	**Constraints**
l_id	int	5	primary key
username	varchar	20	notnull
password	varchar	20	notnull
u_id	int	5	foreign key
type	varchar	50	notnull

Table 2 : complaint			
Field Name	**Data Type**	**Size**	**Constraints**
c_id	int	5	primary key
u_id	int	5	notnull
complaint	varchar	50	notnull
reply	varchar	50	notnull
time	varchar	20	notnull

Table 3 : d_boy			
Field Name	**Data Type**	**Size**	**Constraints**
dboy_id	int	5	primary key
w_id	int	5	foreign key
dboy_name	varchar	20	notnull
phone	int	10	foreign key
gender	varchar	10	notnull
password	varchar	10	notnull
email	varchar	50	notnull
status	varchar	20	notnull
address	varchar	50	notnull
age	int	11	notnull
qualification	varchar	50	notnull
license	varchar	250	notnull
pan	varchar	250	notnull
photo	varchar	250	notnull

Table 4 : hub			
Field Name	**Data Type**	**Size**	**Constraints**
h_id	int	5	primary key
s_id	int	5	foreign key
units_left	int	5	notnull

Table 5 : d_request			
Field Name	**Data Type**	**Size**	**Constraints**
dr_id	int	5	primary key
u_id	int	5	foreign key
latitude	varchar	20	notnull
type	varchar	10	notnull
time	varchar	20	notnull
longitude	float	20	notnull
location	float	20	notnull

Table 6 : enquiry			
Field Name	**Data Type**	**Size**	**Constraints**
en_id	int	11	primary key
sc_id	int	11	foreign key
u_id	int	11	foreign key
enquiry	varchar	100	notnull
response	varchar	50	notnull

Table 7 : payment			
Field Name	**Data Type**	**Size**	**Constraints**
p_id	int	5	primary key
w_id	int	5	foreign key
u_id	int	5	foreign key
s_id	int	5	foreign key
amount	int	11	notnull

Table 8 : work			
Field Name	**Data Type**	**Size**	**Constraints**
work_id	int	5	primary key
s_id	int	5	foreign_key
status	varchar	20	notnull
dboy_id	int	5	foreign key
location	varchar	20	notnull
type	varchar	23	notnull

Table 9 : review			
Field Name	**Data Type**	**Size**	**Constraints**
r_id	int	5	primary key
s_id	int	5	foreign key
u_id	int	5	foreign key
review	varchar	50	notnull
time	varchar	20	notnull
star	int	11	notnull

Table 10 : station			
Field Name	**Data Type**	**Size**	**Constraints**
s_id	int	5	primary key
s_name	varchar	20	notnull
email	varchar	20	notnull
password	varchar	20	notnull
location	varchar	50	notnull
phone	varchar	10	notnull
proof	varchar	250	notnull
electricity_license	varchar	250	notnull
latitude	float	20	notnull
longitude	float	20	notnull
address	varchar	200	notnull

Table 11 : s_center			
Field Name	**Data Type**	**Size**	**Constraints**
sc_id	int	5	primary key
username	varchar	20	notnull
password	varchar	20	notnull
service_available	text		notnull
location	varchar	50	notnull
phone	varchar	10	notnull
email	varchar	20	notnull
status	varchar	10	notnull
sc_name	varchar	20	notnull
latitude	varchar	20	notnull
longitude	varchar	20	notnull
certification	varchar	250	notnull
operating_hours	varchar	20	notnull

Table 12 : s_request			
Field Name	**Data Type**	**Size**	**Constraints**
sr_id	int	5	primary key
u_id	int	5	foreign key
location	varchar	20	notnull
status	varchar	20	notnull
sc_id	int	5	foreign key

Table 13 : s_wallet			
Field Name	**Data Type**	**Size**	**Constraints**
sw_id	int	10	primary key
s_id	int	10	foreign key
bal	int	10	notnull

Table 14 : user			
Field Name	**Data Type**	**Size**	**Constraints**
u_id	int	5	primary key
username	varchar	20	notnull
password	varchar	20	notnull
email	varchar	20	notnull
phone	varchar	10	notnull
vehicle_id	varchar	20	notnull
name	varchar	20	notnull
address	varchar	50	notnull
license	varchar	250	notnull

Table 15 : wallet			
Field Name	**Data Type**	**Size**	**Constraints**
w_id	int	5	primary key
u_id	int	5	foreign key
balance	int	10	notnull

SYSTEM TESTING

4. SYSTEM TESTING

4.1 TESTING

System Testing is a type of software testing that is performed on a complete integrated system to evaluate the compliance of the system with the corresponding requirements la system testing, integration testing passed components are taken as input. The goal of integration testing a to detect any irregularities between the units that are integrated. System testing detects defects within both the integrated units and the whole system. The result of system testing is the observed behaviour of a component or a system when it is tested.

System Testing is carried out on the whole system in the context of either system requirement specifications or functional requirement specifications or in the context of both. System testing tests the design and behaviour of the system and also the expectations of the customer. It is performed to test the system beyond the bounds mentioned in the software requirements specification (SRS).

System Testing is performed by a testing team that is independent of the development team that helps to test the quality of the system impartial. It has both functional and non-functional testing System testing is a black box testing. System Testing is performed after the integration testing and before the acceptance testing.

The type of system testing are:

- Unit Testing
- Integration Testing
- Validation Testing
- Functional Testing
- User Acceptance Testing

4.1.1 UNIT TESTING

Unit Testing is a type of software testing where individual units or components of software are tested. The purpose is to validate that each unit of the software code performs as expected Unit Testing is done during the development (coding phase) of an application by the developers.

4.1.2 INTEGRATION TESTING

Integration Testing is a level of software testing where individual units/components are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and test stubs are used to assist in Integration Testing

4.1.3 VALIDATION TESTING

The process of evaluating software during the development process or at the end of the development process to determine whether it satisfies specified business requirements. Validation Testing ensures that the product actually meets the client's needs.

4.1.4 FUNCTIONAL TESTING

Functional Testing is a type of software testing that validates the software system against the functional requirements specifications. The purpose of Functional tests is to test each function of the software application, by providing appropriate input, verifying the output against the Functional requirements. Functional testing mainly involves black box testing and it is not concerned about the source code of the application. This testing checks User Interface, APIs, Database ,Security ,Client/Server communication, and other functionality of the Application under Test. The testing can be done either manually or using automation

4.1.5 USER ACCEPTANCE TESTING

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done.

SYSTEM IMPLEMENTATION

5. SYSTEM IMPLEMENTATION

System implementation is the process of defining how the information system should be built, ensuring that the information system meets the quality standard. The implementation phase of a project covers the period from the acceptance of the tested design to its satisfactory operations, supported by the appropriated user and the operation manual It is a major operation across the whole organization structure and requires a great deal of planning. Planning of implementation must begin from the initial conception of the project. It requires a thorough knowledge of the new system, its personal need, hardware, and software requirements, file, and procedure conversion activities, and of the current system where an interface with the new, the change to it, the job that will be superseded, etc. Only the analyst responsible for the creation of the new system will possess this knowledge. The new system analyst can schedule and coordinate, but has no executive power. Planning must cover the following aspects:

- **Organization of implementation.**
- **Control of resources.**
- **Motivation of the users. Training and production manuals.**
- **Change over.**

5.1 USER TRAINING

After the system is implemented successfully, training the user is one of the most important sub tasks of the developer. For this purpose, users are trained to operate the developed system. Both hardware and software security will be made to run the developed system successfully in the future. User manuals are prepared and provided to the users.

Development research provides interesting insights into how computer users think about their exposure to the new system.

An analyst should give an accurate idea of the users that need to be trained. They must know what their roles will be, and how they can use the system and what the system will do, and what the system will not the training could cover.

- **Familiarization with the system itself.**
- **Training in using the application, Le. the software application.**
- **Good communication is essential, but this cannot replace training.**
- **There is no substitute for hands on operation of the system while learning its use.**

5.2 SYSTEM MAINTENANCE

To maintain the project, the following steps are followed. Maintenance of software is one of the major steps in the software field. The software, which is developed by an engineer, should undergo a maintenance process regular times as time goes on, new problems arise and it must be corrected accordingly. Maintenance and enhancement are long-term processes. In this project, maintenance is carried over by staff concern. Since they are the key people to developing this project, they know clearly about the project and coding structure. So they will change the coding whenever required. Regarding the project maintenance, the changes will occur then and there according to the conditions

Various types of maintenance that can be done are:

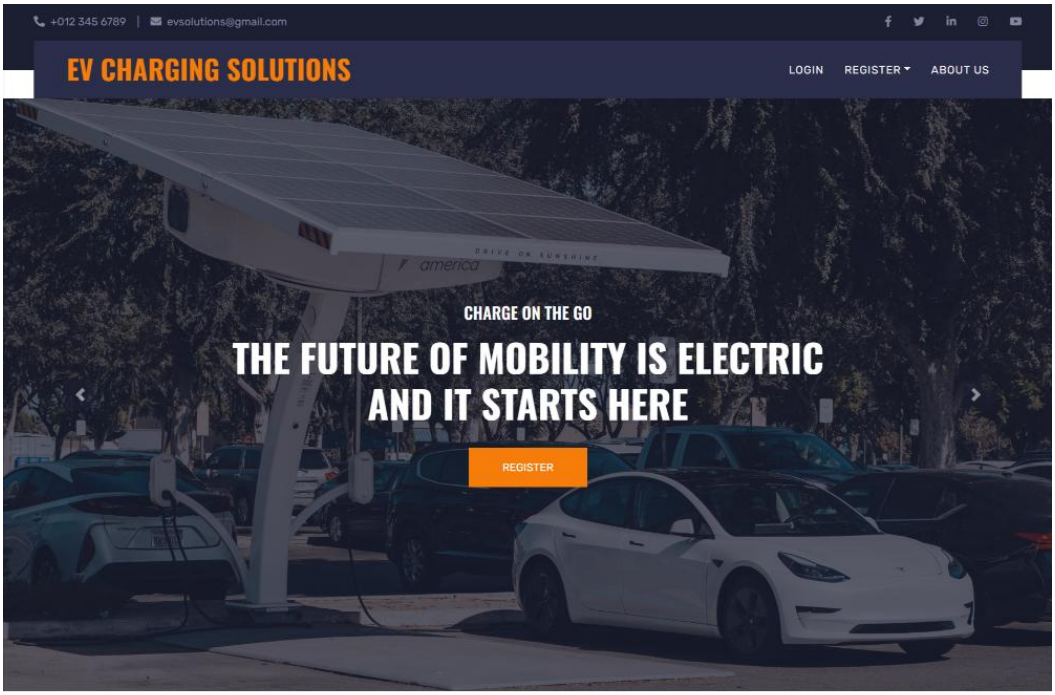
- **Corrective maintenance**
- **Reverse engineering**
- **Re Engineering**

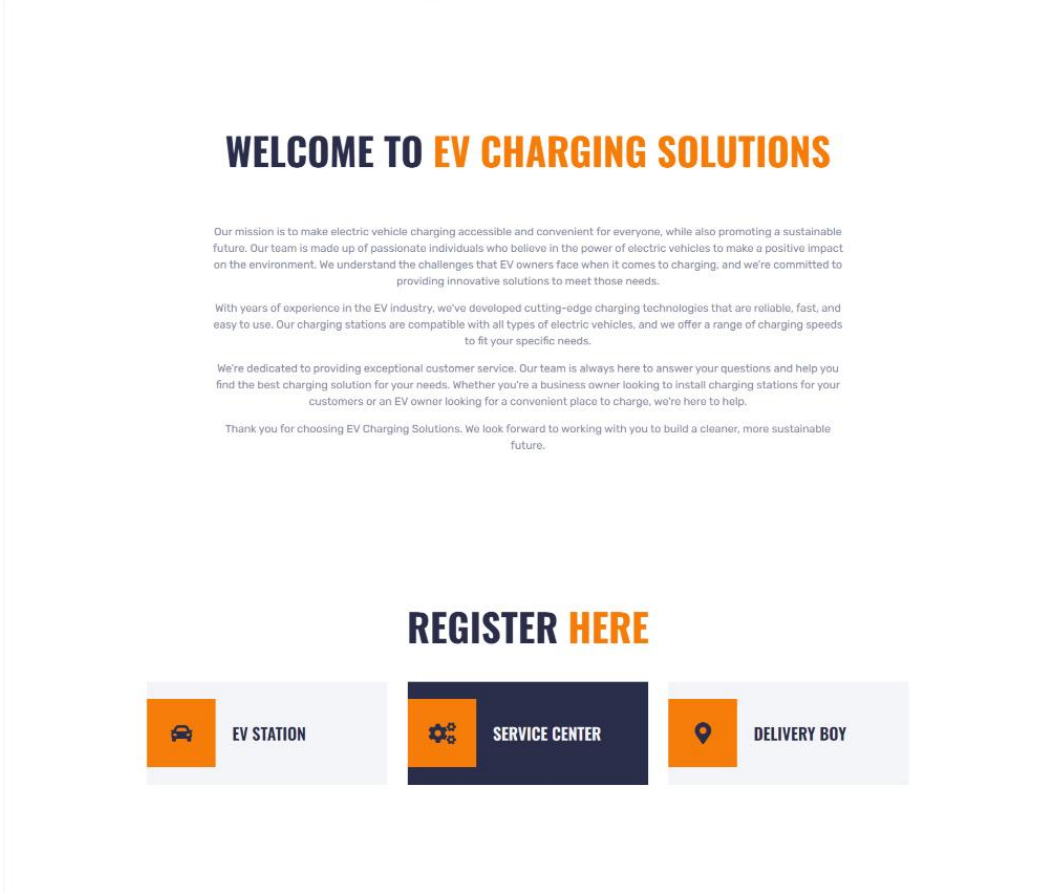
The staff in the concern are parted at each level of the project. So they do not need any further training to use the software. During the development process, they had entered each entry to test the project. They use this as an opportunity to take training in software.

SCREENSHOTS

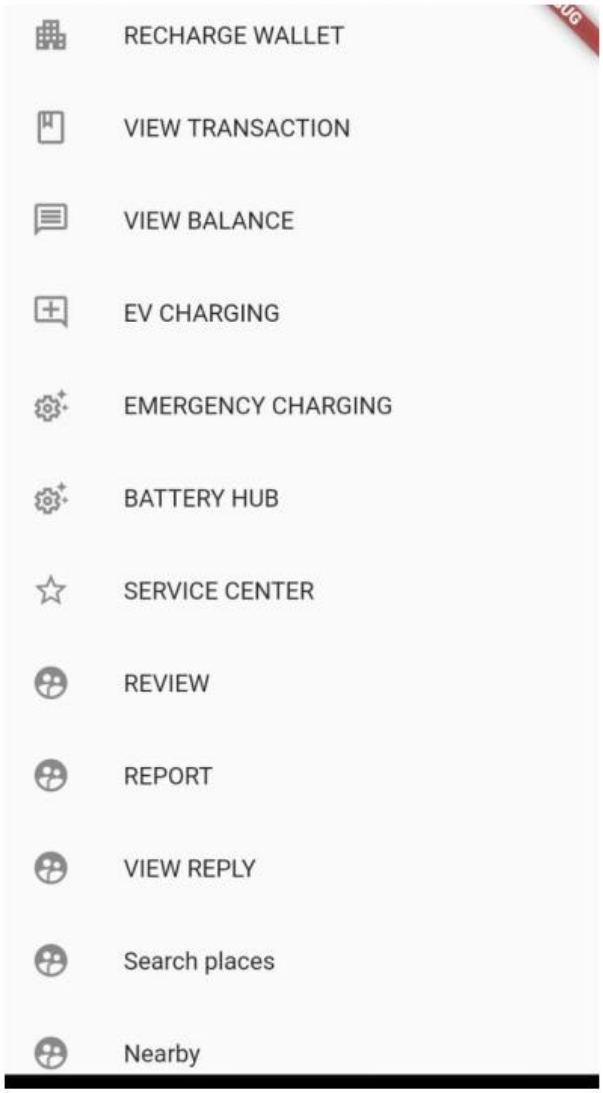
6. SCREENSHOTS

6.1 HOME (FOR WEB)

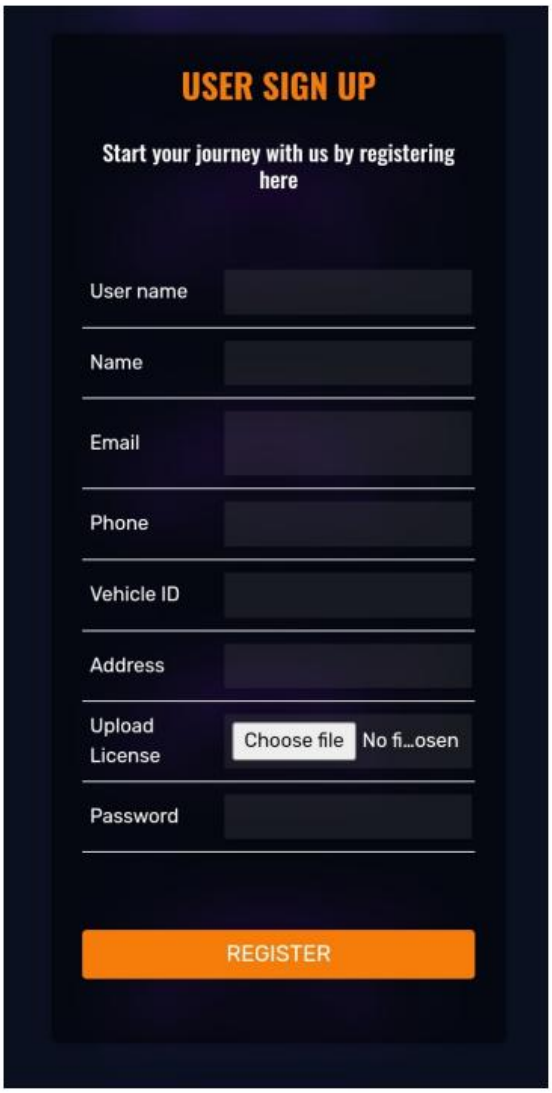




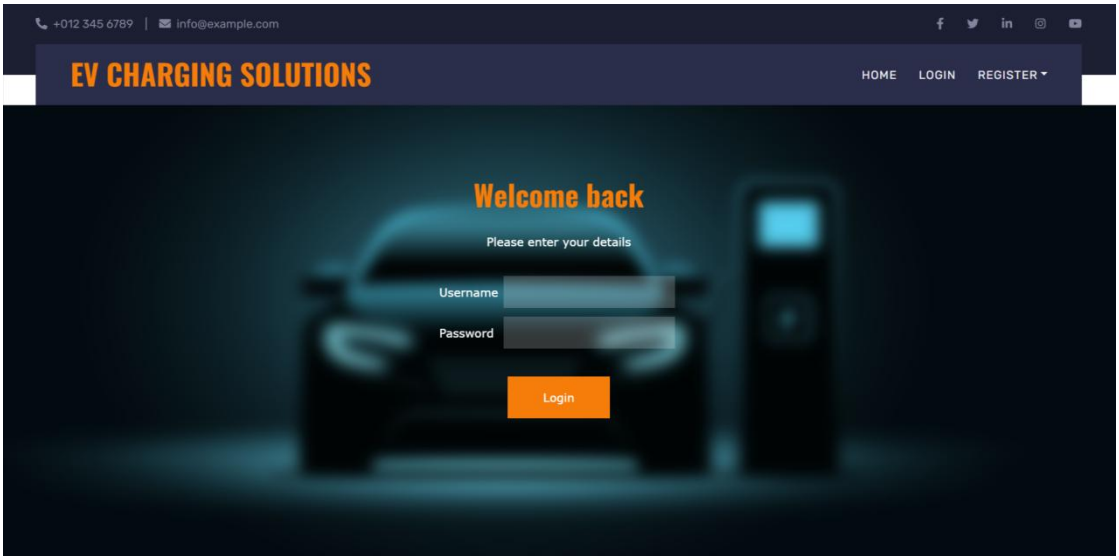
6.2 HOME (FOR APP)



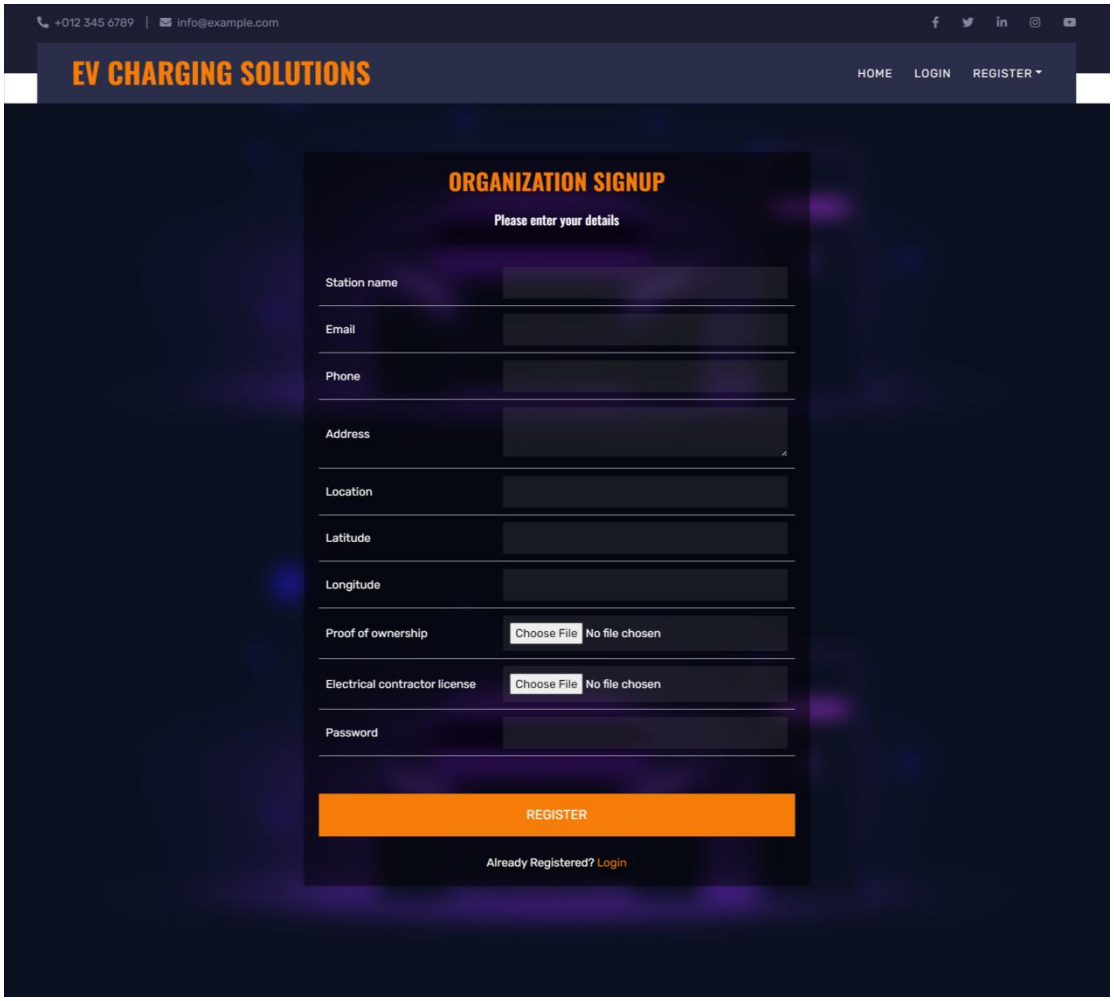
6.3 REGISTER (FOR USER)



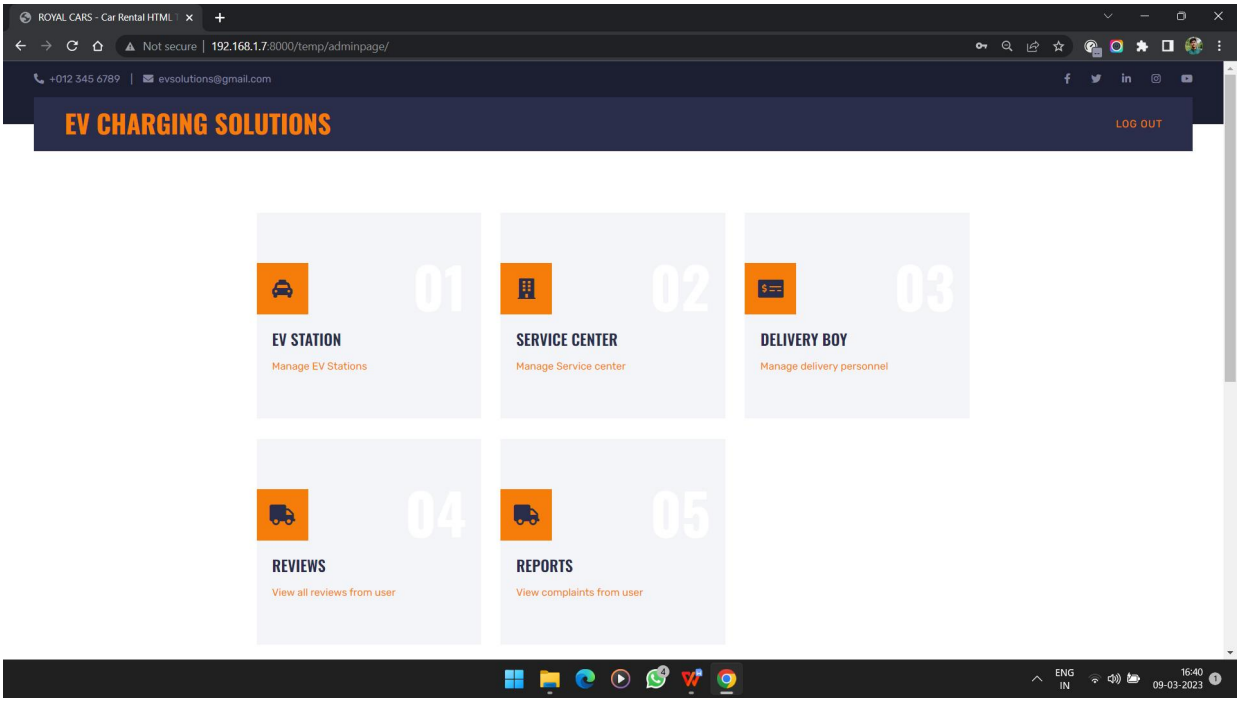
6.4 LOGIN (THROUGH WEB)



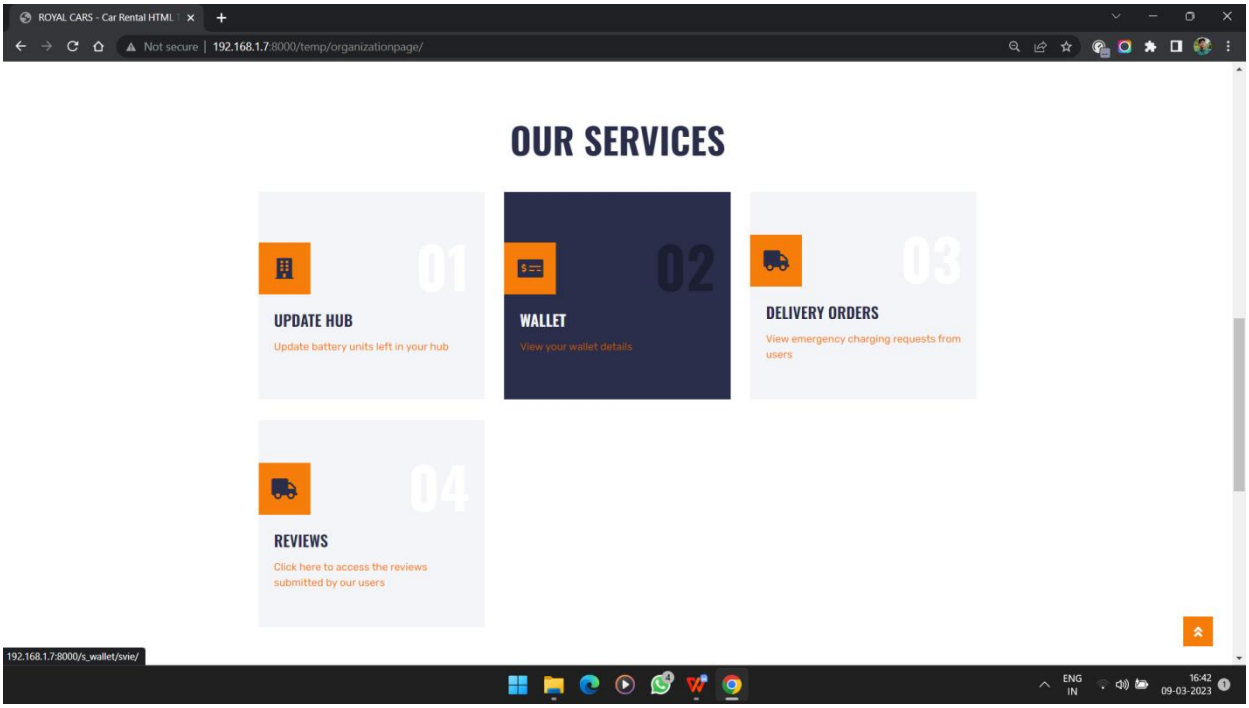
6.5 REGISTER (STATION)



6.6 HOME (ADMIN)

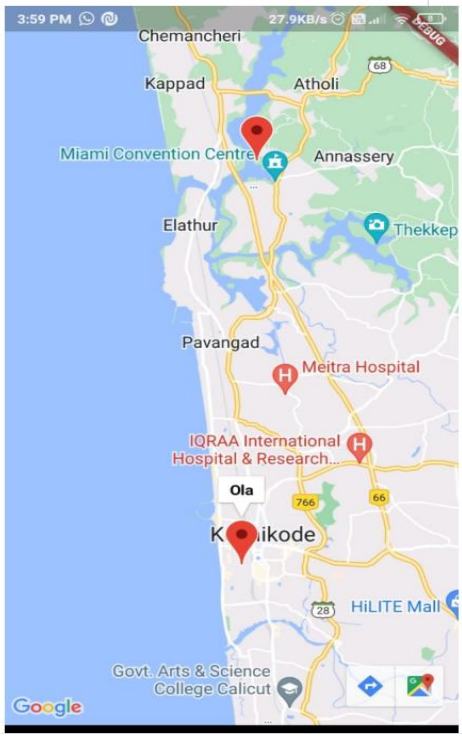


6.7 HOME (STATION)

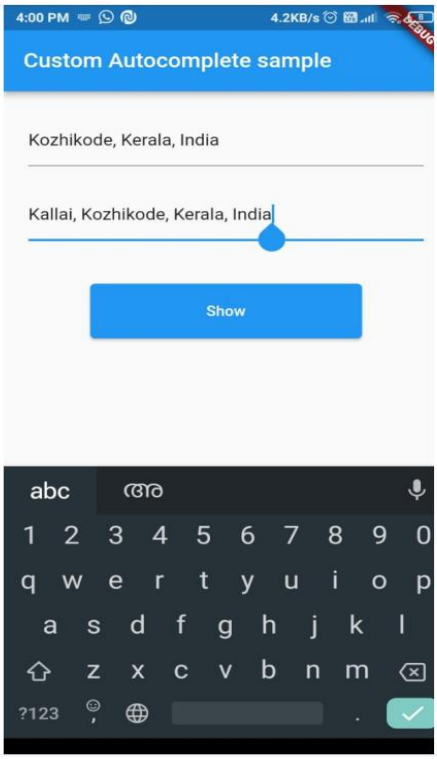


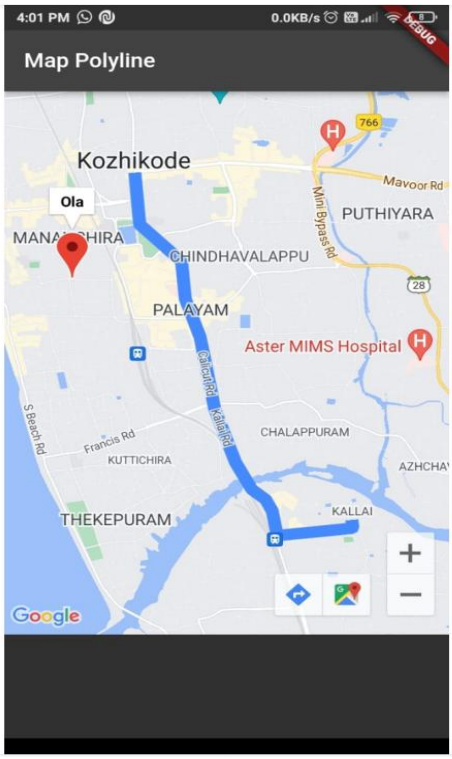
6.8 TOPUP WALLET

6.9 NEARBY SEARCH



6.10 SEARCH BY LOCATION





CONCLUSION

7. CONCLUSION

This report has highlighted the numerous advantages of electric vehicles over traditional gasoline-powered vehicles, including lower emissions, increased energy efficiency, and improved performance. However, the challenge of finding reliable and convenient charging stations has been identified as a major obstacle to the widespread adoption of EVs. The **EVConnect** platform offers a promising solution to this challenge by providing a user-friendly platform for EV owners to find and utilize charging stations, while also benefiting charging station operators. As the transition to sustainable transportation continues to gain momentum, platforms like **EVConnect** will play an increasingly vital role in facilitating this transition and helping to reduce the negative impact of transportation on the environment.

FUTURE ENHANCEMENTS

8. FUTURE ENHANCEMENTS

- Integrate a rewards program for users who frequently use your charging stations. This could be in the form of discounts on charging fees or other perks.
- Develop a feature that allows users to reserve charging spots in advance, so they don't have to worry about finding an available spot when they arrive at the station.
- Add a chat-bot feature that can provide quick answers to common questions users may have about the charging process or their account.

BIBLIOGRAPHY

9. BIBLIOGRAPHY

W3Schools (https://www.w3schools.com/)

FreeCodeCamp (https://www.freecodecamp.org/learn/)

TutorialsPoint (https://www.tutorialspoint.com/python/index.htm)

Yes Tech Media (https://www.youtube.com/@YesTechMedia)