**INTERNET OF VEHICLES (IoV) BASED**

**ANDROID APP DEVELOPMENT**

**A Project Report**

***Submitted by:***

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***in partial fulfillment for the award of the degree***

***of***

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING**

at

**SRM University- AP, Amaravati -522502**

**Andhra Pradesh, INDIA**

**MARCH &2021**

**DECLARATION**

I hereby declare that the project entitled “ INTERNET OF VEHICLES (IOV) BASED ANDROID APP DEVELOPMENT ” submitted for the B. Tech. (CSE) degree is my original work and the project has not formed the basis for the award of any other degree, diploma, fellowship or any other similar titles.

**Signature of the Student**

**Place**: AMARAVATI

**Date:** MARCH,2021

**CERTIFICATION**

This is to certify that the project titled“ INTERNET OF VEHICLES (IOV) BASED ANDROID APP DEVELOPMENT” is the bona fide work carried out by a student of B Tech (CSE) of SRM University AP, Andhra Pradesh (India) during the academic year 2020-21, in partial ful fillment of the requirements for the award of the degree of Bachelor of Technology (Computer Science and Engineering ) and that the project has not formed the basis for the award previously of any other degree, diploma, fellowship or any other similartitle.

**Signature of the Guide**

**Place:**

**Date:**

**ACKNOWLEDGEMENT**

We have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

The project could not have completed without support extends to us by Dr .Sriramulu Bojjagani, he guided us in preparation of the project and every time when we reached with difficulties, she welcomed them which helped us to successfully complete the project. We express our heartfelt gratitude with great pleasure and a sense of obligation to Dr . Sriramulu Bojjaganiour project in charge for His timely support and supervision.

We would like to place on record the deep sense of gratitude to the honourable Vice Chancellor SRM AP University for providing the necessary facilities to carry the project based lab. Last, but not the least, we thank all Teaching and Non-Teaching Staff of our department and especially my classmates and my friends for their support in the completion of our project based lab.

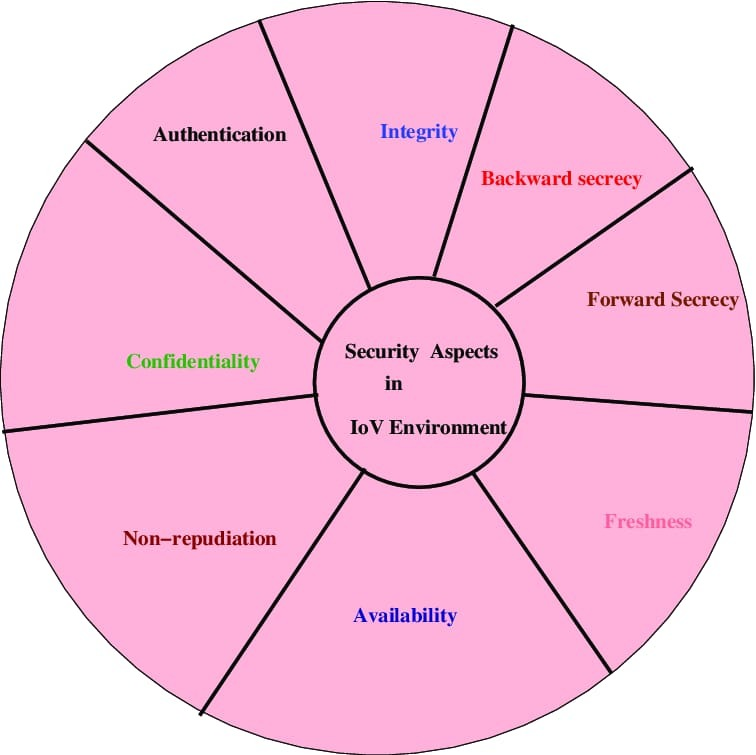
ABSTRACT:

The internet of vehicles (IoV) is regarded as an extension of the V2V communication network. With the assistance of vehicle artificial intelligence (AI) knowledge of other vehicles and their behaviour, the internet of vehicles (IoV) helps to improve driving aids. IoV is linked in an ad hoc networking environment called a vehicular ad hoc network (VANET), which uses each vehicle in the network as a node.Where the vehicles may also be connected to the public Internet. It is particularly important for autonomous vehicles since they can interact with other vehicles in their immediate vicinity. Furthermore, in order to maintain safe and smart transportation, it is important to avoid accident-prone areas. Since communication between different individuals participating in the IoV environment occurs over an open channel, a passive/active adversary has the ability to intercept, alter, erase, or even inject false information during communication. It is then a major concern for vehicle users to assess if the information obtained is correct. In the Internet of Things, protection becomes important because any device failure has a direct effect on user safety. From an IoV viewpoint, we address security problems, various security threats, and their countermeasures in this paper. In the IoV, we also suggest an authentication method for (V2I) vehicle-to-infrastructure communication.

**INTRODUCTION:**

In our Project, we developed an Android app. Here the Vehicle to device connection has happened. In this app, we make GPS connectivity also that’s why we can view a map and as well as directions.

The Internet of Vehicles (IoV) technology forced vehicle hardware to advance by installing various intelligent devices, processors, and sensors inside the vehicle that include accessorised parts of the car and external sensors including cameras, location tracking, some sensors for drivers, sensors to analyse the physical, mental, and emotional condition of the driver, actuators providing a multisensory platform, and many more.



**Fig1.Various Security aspects in IoV Enivronment**

**Integrity:** The data sent and received should be similar, meaning there should be no data distortion on the network. Message tampering, masquerading, black hole, grey hole, fabrication, and malware (using hashing technologies) are all threats that can be used.

**Backward secrecy:** When a new vehicle node enters an existing network, the operator of that vehicle should not be aware of the messages that were flown before the vehicle entered the network.

**Forward secrecy:** An IoV network is one in which the nodes are constantly moving. As a result, a node's membership against a location changes over time. As a result, the network must be refreshed any time a node enters or exits the network to preserve privacy. After a vehicle node exits an IoV network, the vehicle should not be exposed to messages.

**Availability:** As the number of vehicles on the road grows, so does the number of people who participate in IoV. As a result, when there are a large number of requests or when the network is congested, the network may break down. As a result, one of the system's primary obligations is to make the system accessible to all legal users. DoS, black hole, grey hole, spamming, jamming, and malware attacks are some of the potential attacks on availability. Spamming sends spam messages across the network, consuming a lot of bandwidth and impacting the latency of regular packets throughout the network.

**Non-repudiation:** Any emergency accident on the road necessitates the identification of the right perpetrator. To meet this requirement, all users within the accidental contact range must be unable to reject any sent message.

**Confidentiality:** While certain details in the IoV must be made public, the privacy and protection of the consumers or businesses participating in the IoV are the most critical aspects of the paradigm. As a result, the adversary should not have access to private or sensitive information (encryption being the solution). Eavesdropping allows an adversary to analyze traffic or data without interfering with the network, as well as perform identity theft, traffic analysis, and malware.

The rapid advancement of technology in recent decades has given rise to a modern idea of a universal network, which consists of all existing heterogeneous networks that can be reached and used by a wide range of devices. Today, the internet has been expanded to almost every part of the globe, and we have a vast range of devices of various types that can link to the internet. These devices are known as "Things" because they are interconnected and can provide various services through contact with other devices. All devices that can connect to the internet and exchange data are called “Things,” whether they are laptops or vending machines. The word "Internet of Things" or "IoT" refers to the entire network structure of such things that offer different services to users. Because of the vast number of services that IoT aims to provide, research in the field of Internet of Things is moving at a rapid pace at both the industrial and academic levels. IoT is being implemented into a number of social fields, including smart health, smart cities, and smart transportation, to name a few, and is expected to increase business automation, thus raising productivity and lowering costs. IoV Internet of Vehicles is a technology that has evolved from the Internet of Things. With an ever-increasing number of vehicles capable of connecting to the internet, our conventional vehicular ad-hoc network (VANET) has developed into the internet of vehicles (IoV). The nature of vehicular cloud, which offers an open interface, helps IoV address the limitations of VANETs. Based on similarities and differences, the vehicles in a given region are divided into various clusters. Both cluster members communicate with their cluster leaders, who then save data to the cloud. If all data contact was between all participants instead of just the cluster heads, the band of spectrum needed would be reduced.

Not only that, but it also allows for distributed spying over the network to monitor data in and out.

IoV will be a game changer and a blessing to the transportation system, with various advantages as mentioned below.

•Cost-effective: Better traffic management would result in lower insurance rates, operational costs, warranty costs, public health rates, and so on.

•Time-saving: Thoroughly analysed traffic will monitor the time of passengers, riders, and all other users.

•Smart city evolution: IoV allows cities to become more coordinated by offering services such as pre-informed parking and improved navigation, real-time traffic visibility, accident notification, and path optimization.

•Reducing life-threatening risks: By inspecting traffic, road conditions, and accident-prone circumstances, traffic may be directed by navigation, emergency services, or instantaneous services.

•System of automatic and troubling alerts.

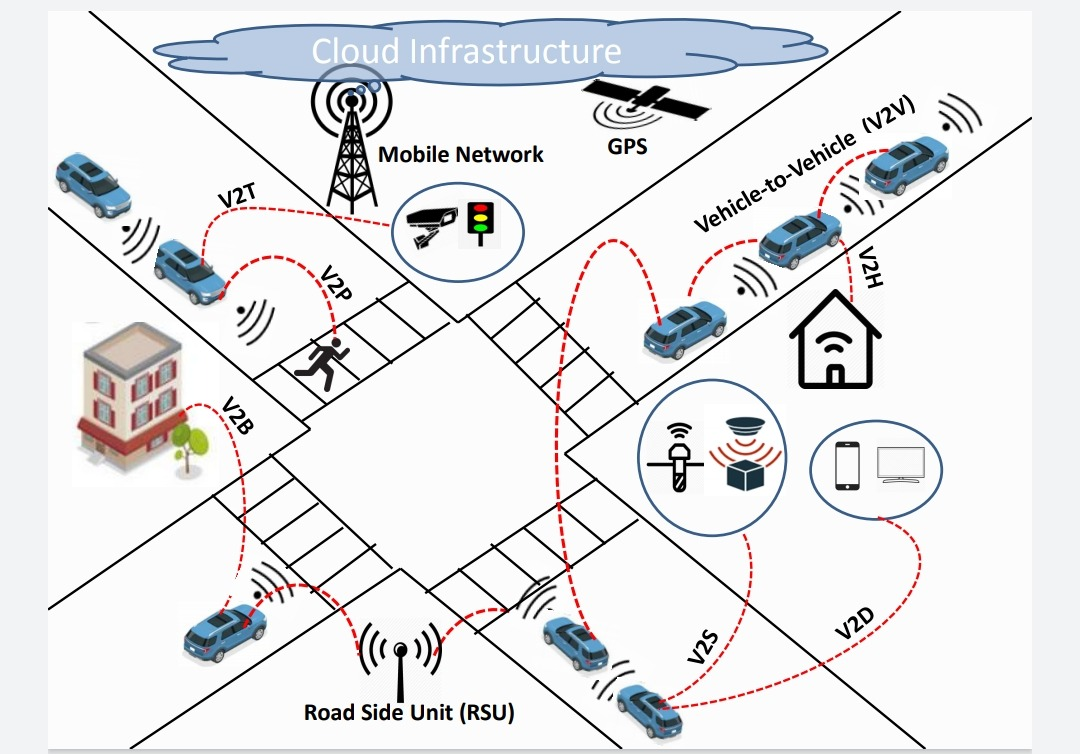
•Services such as meals on wheels and music on the road are all part of smart automated driving.

•Services such as Toll payment.

Being in the generation of Internet connectivity, there is a need to stay in a safe and hassle-free environment. And also we have benefits of IoV over VANET and then 5 types of vehicular communication in it we have vehicular to vehicular(V to V), vehicular to roadside(V to RS), vehicular to infrastructure cellular network(V to I), vehicular to personal devices(V To P), vehicular to sensors(V to S).

The Internet of vehicles can be considered as a convergence of the mobile internet and traditional Internet of Things. The below figure shows the architecture of the internet of vehicles concerning smart cities. It is huge network of interactions between various entities of vehicle-to-home(V2H), vehicle-to-road(V2R), vehicle-to-home(V2H), vehicle-to-everything(V2X), vehicle-to-building(V2B), vehicle-to-grid(V2G), and vehicle-to-vehicle(V2V), vehicle-to-infrastructure(V21) .

It also allows data shares between device-to-device (D2D), vehicle-to-sensor (V2S) and vehicle-to-device (V2D).



**Fig 2. An architecture of internet of vechicles (IoV) concerning smart cities**

This architecture shows us the functionality of internet of vechicles in smart cities

Cloud infrastructure refers to the hardware, abstracted resources, storage, and network resources needed for cloud computing. Cloud infrastructure is needed to host cloud services and applications.

**SOFTWARE AND HARDWARE REQUIREMENTS USED:**

MobileName: Samsung Galaxy A30s

Processor: Octa –coreExynos 7904

RAM: 4GB

Operating System: One UI 2.0

Version: Android 10 which is the latest updated version.

Android studio: version 4.2

Operating system: Android studio

8 GB RAM is required

2 GB disk space availability is required

4 GBis Recommended (500 MB for IDE + and 1.5 GB for Android SDK and

emulator system image)

1280 x 800 minimum screen resolution is required

Data base used: Sqlite

**LITERATURE SURVEY:**

A review of the previous work survey provides new frameworks for the development of IoV for smart cities.

Li-Minn Ang et al.[1] developed a new universal architecture for the IoV, which can be used for different communication models in smart cities to address various challenges like driver safety, traffic efficiency, large-scale data sensing, collection, information processing etc., in the year 2018.

Leandros Maglaras et al. [2] proposed a model for the social internet of vehicles for smart cities: A network that enables social interactions between various entities like drivers, vehicles, devices. Identified issues in IoV regarding security and privacy in the year 2016.

Nishant sharma et al. [3] proposed a model for security challenges in the Internet of Vehicles(IoV) environment, Developed internet of vehicle network model and also internet of vehicle system overview in the year 2018.

Ankita mahamune et al. [4] developed the key technologies and the development status of the internet of things based connected vehicles in smart cities in the year 2017.

Panos Papadimitratos et al. [5] made vehicular communication systems: enabling technologies, applications, and future outlook on intelligent transportation, in the year 2009.

Sherali zeadally et al. [6] internet of vehicles: Architecture protocols and security and also proposed seven-layer IoV architecture based on [24]-[26] in the year 2016.

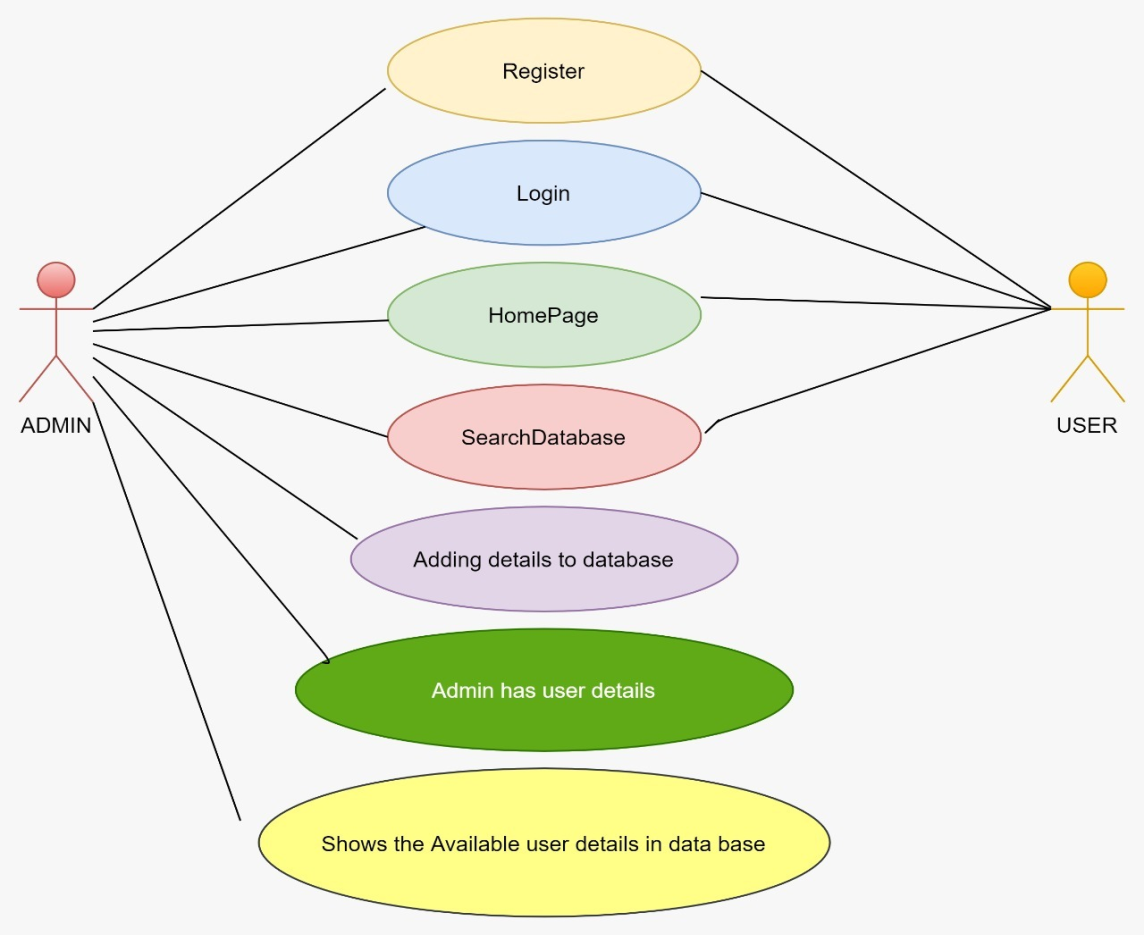
Wazid et al. [7] developed a frame work on AKM-IoV. It deals with the key management protocol in fog computing. To achieve security features between vehicles, road-side units, fog serves and cloud serves, they designed a secure protocol called authenticated key management protocol called AKM-IoV. The practical protocol demonstration was done using NS2 simulation.

Tao Zhang. [8] made connected vehicles have many security vulnerabilities and also described securing connected vehicles: Challenges and opportunities. He said going forward, need joint industry-academia-government efforts to build, identify, develop, test in the year 2015.

Felipe Domingos da Cunha et al. [9] developed a frame work on VANET Architectures and he said data communication in VANETs: Survey, Applications and their challenges and the multichannel operation in vehicular network also in the year 2016.

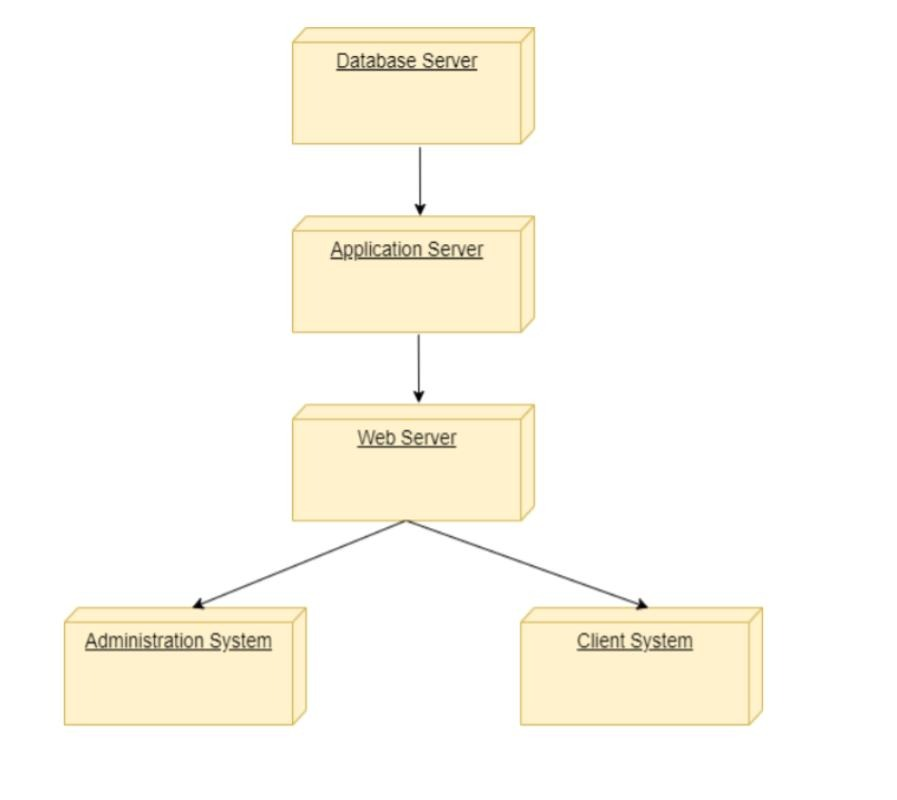
Yasir Mehmood et al. [10] proposed the internet-of-things-based smart cities: Recent advances and challenges. The emerging of internet of things market is continuously gaining momentum in the year 2017.

**DESIGNING:**

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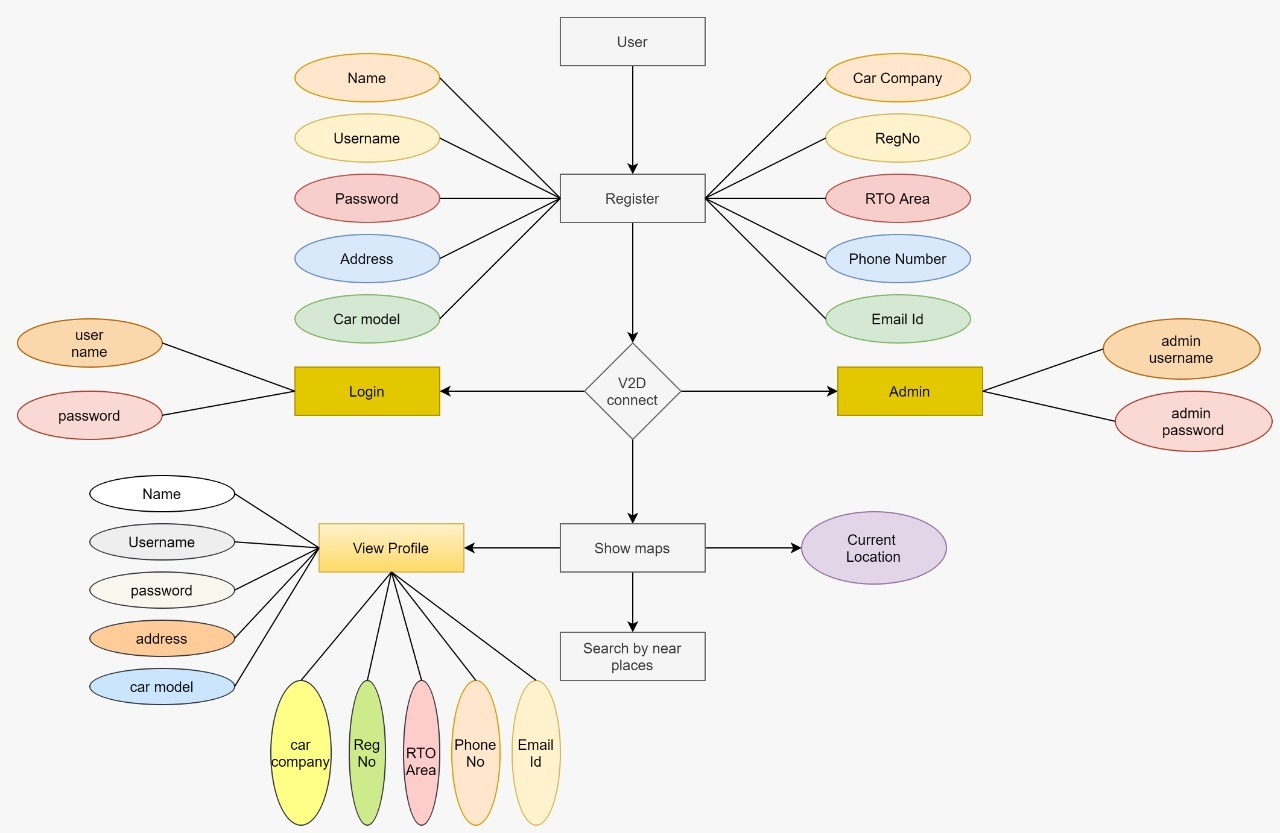
**Fig 3. USE CASE DIAGRAM**

A use case diagram is a visual representation of how a consumer could interact with a device. A use case diagram depicts the system's numerous use cases and different categories of users and is often followed by other diagrams.

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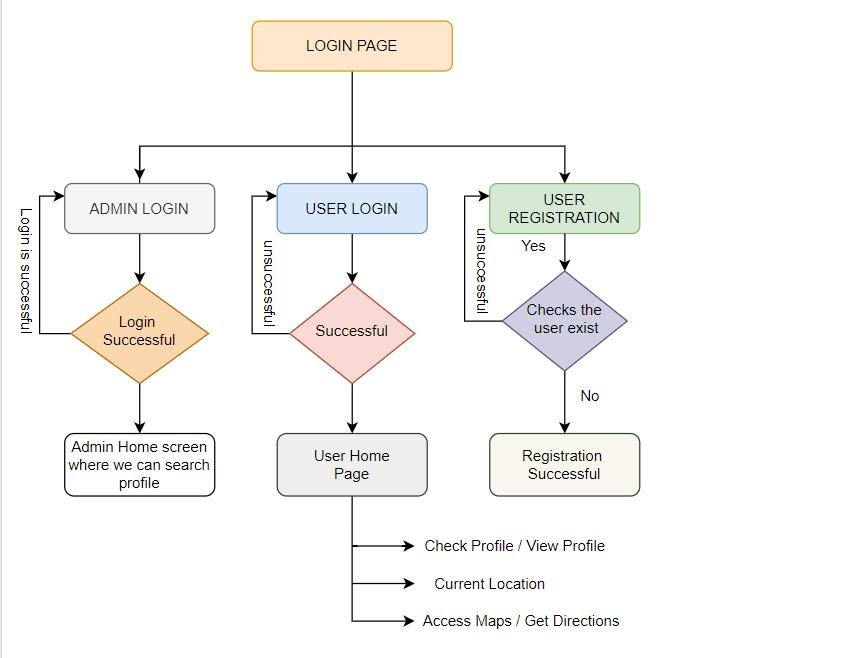
**Fig 4. DEPLOYMENT DIAGRAM**

Deployment diagrams are used to illustrate the topology of a system's physical elements, as well as the locations of software components. The static deployment view of a system is represented by deployment diagrams. The nodes and their relationships make up deployment diagrams.

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**Fig 5. ER DIAGRAM**

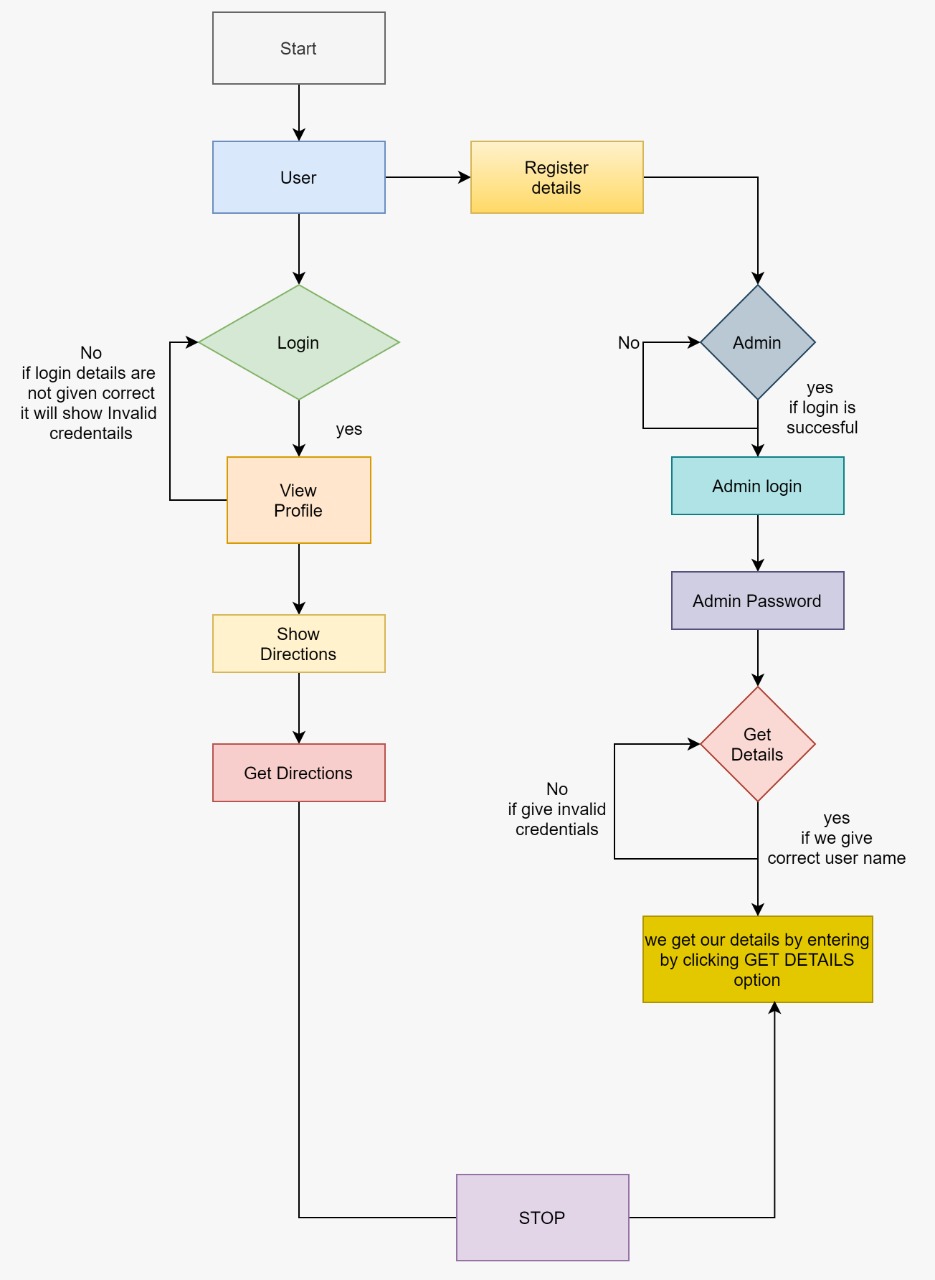
The Entity Relationship Diagram, otherwise known as the ERD, ER Diagram, or ER model, is a type of database design structural diagram. The major entities within the system scope, as well as the inter-relationships among these entities, are visualized using different symbols and connectors in an ERD.

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**Fig 6. WORK FLOW**

A workflow diagram depicts a management process from beginning to end in a step-by-step, linear manner. It depicts the movement of individual tasks, acts, or resources between individuals or groups. It also outlines what needs to be done to complete the goal.

**FLOW CHART:**



A flowchart is a graphical representation of a series of measures. It is commonly used to present the flow of algorithms, workflows, or processes because it displays steps in sequential order. A flowchart typically depicts the steps as different types of boxes, with arrows linking them in the proper order.

**PROPOSED SYSTEM:**

Iov based android app development is proposed to replace the RTO office work.

This application allows user to easily register their vehicle details such as registration number, vehicle model, and other information required.

This App is versatile and user-friendly.

And the amount of time taken to get the details and other information will be reduced.

**GOALS:**

The main goal of this project is to simplify the process of information management in any RTO office.

It helps the management to maintain the information about the users vehicle. Thus it helps the management to maintain the records in a systematic order and also to access details very quickly.

This can be implemented in all RTO offices to proceed the office works smoothly.

This entire system is managed by a system administrator, who has complete system power, to read, write and executes the results, and grants access to admin and user.

**BENFITS:**

Eco-friendly: You can avoid paperwork.

Effective user Data Management.

Supervise user information.

**DATABASE DESIGN:**

This system is designed to handle processes such as input information efficiently, storing details automatically, and interpreting the overall vehicle information. The usual manual process has now reached a level where coping with the magnitude of work in the given time, is difficult for the available man power. Imbalance between the availability of man power and the amount of work to be done in the process leads to delay in vehicle information. Consequently, the introduction of computerization is an effective measure which can improve the efficiency of the vechicle information processing, especially with the use of software for the vechicle information processing. Computerized database systems such as the SQLite have been built to minimize redundancy of data.

**SAMPLE DATA BASE VALUES INSERTED IN SQL DATA BASE FOR THIS APP**

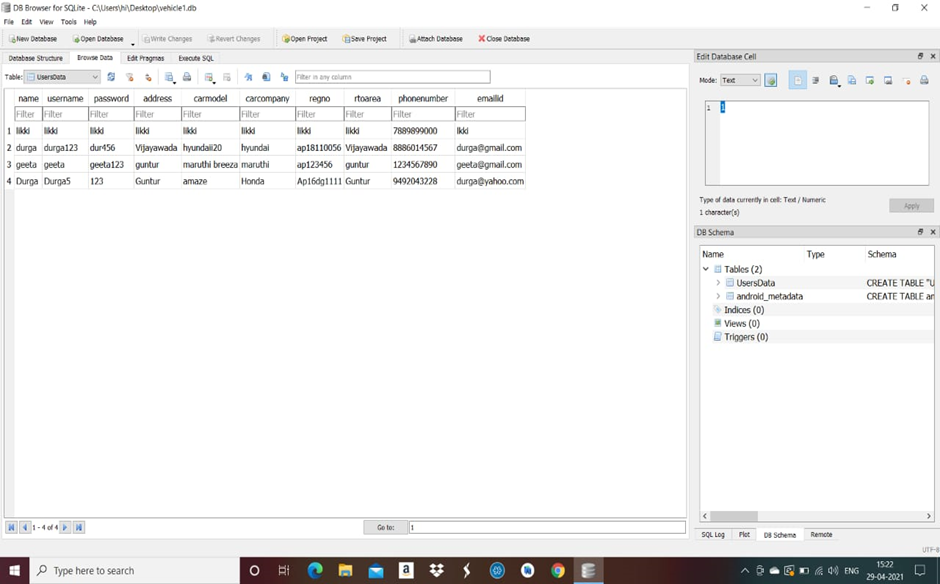


Fig 7

The figure 7 which mainly represents about the sample data base values that are inserted in the sql lite data base for this app.

**IMPLEMENTATION**:

**SOURCE CODE**:

1. **Main Activity.java**

**public class** MainActivity**extends** AppCompatActivity {

EditText**e1**;

EditText**e2**;

DatabaseAccess**databaseAccess**;

**protected void** onCreate(Bundle savedInstanceState) {

**super**.onCreate(savedInstanceState);

setContentView(R.layout.***activity\_main***);

**e1** = (EditText)findViewById(R.id.***unamelogin***);

**e2** = (EditText)findViewById(R.id.***passwordlogin***);

**databaseAccess**=DatabaseAccess.*getInstance*(getApplicationContext());

}

**public void** loginNow(View view) {

**databaseAccess**.open();

String uname = **e1**.getText().toString();

String pass = **e2**.getText().toString();

**if**(**databaseAccess**.checkusernamepassword(uname,pass)){

Intent in4 = **new** Intent(MainActivity.**this**,LoggedIn.**class**);

in4.putExtra(**"uname"**,uname);

startActivity(in4);

**e1**.setText(**""**);

**e2**.setText(**""**);

}

**else**{

Toast.*makeText*(**this**, **"Invalid Credentials"**, Toast.***LENGTH\_LONG***).show();

}

**databaseAccess**.close();

}

**public void** registerNow(View view) {

Intent in3 = **new** Intent(MainActivity.**this**,Signup.**class**);

startActivity(in3);

}

**public void** adminpage(View view) {

Intent i8 = **new** Intent(MainActivity.**this**,AdminLogin.**class**);

startActivity(i8);

}

}

1. **Signup.java**

**if**(!name.isEmpty() && !username.isEmpty() && !password.isEmpty() && !address.isEmpty() && !carcompany.isEmpty() && !carmodel.isEmpty() && !regno.isEmpty() && !rtoarea.isEmpty() && !phonenumber.isEmpty() && !emailid.isEmpty()){

**if**(phonenumber.length()!=10){

Toast.*makeText*(**this**, **"Enter Valid Phone Number"**, Toast.***LENGTH\_LONG***).show();

}

**else if**(**databaseAccess**.checkusername(username)){

Toast.*makeText*(**this**,**"User Already Exists"**,Toast.***LENGTH\_LONG***);

}

**else**{

**boolean**check = **databaseAccess**.insertData(name,username,password,address,carmodel,carcompany,regno,rtoarea,phonenumber,emailid);

**if**(check){

Toast.*makeText*(**this**, **"Registration Done"**, Toast.***LENGTH\_LONG***).show();

Intent in2 = **new** Intent(Signup.**this**,MainActivity.**class**);

startActivity(in2);

}

**else**{

Toast.*makeText*(**this**, **"Registartion Failed"**, Toast.***LENGTH\_LONG***).show();

}

}

}

**else**{

Toast.*makeText*(**this**, **"Enter Complete Details"**, Toast.***LENGTH\_LONG***).show();

}

**databaseAccess**.close();

}

}

1. **Database Access.java**:-

**public class** DatabaseOpenHelper**extends** SQLiteAssetHelper {

**private static final** String ***DATABASE\_NAME*** = **"vehicle.db"**;

**private static final int*DATABASE\_VERSION*** =1;

**public**DatabaseOpenHelper(Context context) {

**super**(context,***DATABASE\_NAME***,**null**,***DATABASE\_VERSION***);

}

}

**public class** DatabaseAccess {

**private**SQLiteOpenHelper**openHelper**;

**private**SQLiteDatabase**db**;

**private static** DatabaseAccess*instance*;

DatabaseAccess(Context context){

**this**.**openHelper**= **new** DatabaseOpenHelper(context);

}

Cursor **c** = **null**;

**public static** DatabaseAccessgetInstance(Context context){

**if**(*instance*==**null**)

*instance*= **new** DatabaseAccess(context);

**return***instance*;

}

**public void** open(){

**this**.**db**= **openHelper**.getWritableDatabase();

}

**public void** close(){

**if**(**db**!=**null**)

**this**.**db**.close();

}

**public**Boolean insertData(String name,Stringusername,String password, String address,

String carmodel,Stringcarcompany,Stringregno,Stringrtoarea, String phonenumber,Stringemailid){

ContentValuescontentValues = **new** ContentValues();

contentValues.put(**"name"**,name);

contentValues.put(**"username"**,username);

contentValues.put(**"password"**,password);

contentValues.put(**"address"**,address);

contentValues.put(**"carmodel"**,carmodel);

contentValues.put(**"carcompany"**,carcompany);

contentValues.put(**"regno"**,regno);

contentValues.put(**"rtoarea"**,rtoarea);

contentValues.put(**"phonenumber"**,phonenumber);

contentValues.put(**"emailid"**,emailid);

**long**result = **db**.insert(**"UsersData"**,**null**,contentValues);

**if**(result==-1)

**return false**;

**return true**; }

**public**Boolean checkusername(String username){

Cursor cursor = **db**.rawQuery(**"select \* from UsersData where username ='"**+username+**"'"**,**new**String[]{});

**if**(cursor.getCount()>0){

**return true**;} **return false**;}

**public**Boolean checkusernamepassword(String username,String password){

**c** = **db**.rawQuery(**"select \* from UsersData where username ='"**+username+**"' and password = '"**+password+**"'"**,**new**String[]{});

**if**(**c**.getCount()>0){

**return true**;

}

**return false**;

}

String getUserData(String username){

Cursor cursor = **db**.rawQuery(**"select \* from UsersData where username ='"**+username+**"'"**,**new**String[]{});

String ans = **""**;

**while**(cursor.moveToNext()){

ans += **"Name : "**+cursor.getString(0)+**"\n\n"**;

ans += **"Username : "**+cursor.getString(1)+**"\n\n"**;

ans += **"Password : "**+cursor.getString(2)+**"\n\n"**;

ans += **"Address : "**+cursor.getString(3)+**"\n\n"**;

ans += **"Car Model : "**+cursor.getString(4)+**"\n\n"**;

ans += **"Car Company : "**+cursor.getString(5)+**"\n\n"**;

ans += **"Reg NO : "**+cursor.getString(6)+**"\n\n"**;

ans += **"RTO Area : "**+cursor.getString(7)+**"\n\n"**;

ans += **"PhoneNumber : "**+cursor.getString(8)+**"\n\n"**;

ans += **"Email Id : "**+cursor.getString(9);

}} **return**ans;}}

**Sample XML CODES**:-

**<ScrollView**

**android:layout\_width="match\_parent"**

**android:layout\_height="match\_parent">**

**<LinearLayout**

**android:layout\_margin="20dp"**

**android:layout\_gravity="center\_vertical"**

**android:layout\_width="match\_parent"**

**android:orientation="vertical"**

**android:layout\_height="wrap\_content">**

**<EditText**

**android:layout\_width="300dp"**

**android:layout\_gravity="center\_horizontal"**

**android:layout\_height="wrap\_content"**

**android:id="@+id/unamelogin"**

**android:layout\_margin="15dp"**

**android:textAlignment="center"**

**android:hint="Enter UserName**"

**android:drawableLeft="@drawable/ic\_baseline\_person\_24"/>**

**<EditText**

**android:layout\_width="300dp"**

**android:layout\_margin="15dp"**

**android:layout\_gravity="center\_horizontal"**

**android:layout\_height="wrap\_content"**

**android:id="@+id/passwordlogin"**

**android:inputType="textPassword"**

**android:textAlignment="center"**

**android:hint="Enter Password"**

**android:drawableLeft="@drawable/ic\_baseline\_remove\_red\_eye\_24"/>**

<Button

android:layout\_width="300dp"

android:layout\_height="wrap\_content"

android:text="Login"

android:padding="10dp"

android:layout\_marginTop="20dp"

android:textStyle="bold"

android:onClick="loginNow"

android:layout\_gravity="center\_horizontal"

android:layout\_marginBottom="30dp"

/>

<Button

android:layout\_width="300dp"

android:layout\_height="wrap\_content"

android:text="Register"

android:padding="10dp"

android:layout\_marginTop="20dp"

android:textStyle="bold"

android:onClick="registerNow"

android:layout\_gravity="center\_horizontal"

android:layout\_marginBottom="30dp"

/>

<Button

android:layout\_width="300dp"

android:layout\_height="wrap\_content"

android:text="Admin Login"

android:padding="10dp"

android:layout\_marginTop="20dp"

android:textStyle="bold"

android:onClick="adminpage"

android:layout\_gravity="center\_horizontal"

android:layout\_marginBottom="30dp"

/>

</LinearLayout>

</ScrollView>

<androidx.coordinatorlayout.widget.CoordinatorLayoutxmlns:android="http://schemas.android.com/apk/res/android"

xmlns:app="http://schemas.android.com/apk/res-auto"

xmlns:mapbox="http://schemas.android.com/apk/res-auto"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent">

<com.mapbox.mapboxsdk.maps.MapView

android:id="@+id/mapView"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

mapbox:mapbox\_cameraZoom="0.346515"

/>

<com.google.android.material.floatingactionbutton.FloatingActionButton

android:id="@+id/fab\_location\_search"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_gravity="end|bottom"

android:layout\_margin="16dp"

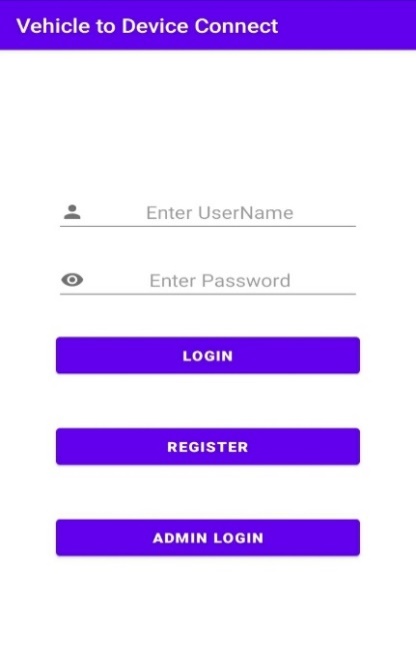
android:tint="@android:color/white"

app:backgroundTint="@color/colorPrimary"

app:srcCompat="@android:drawable/ic\_search\_category\_default" />

</androidx.coordinatorlayout.widget.CoordinatorLayout>

**RESULTS:**



**Fig 8.LOGIN PAGE**

The figure 8 represents Login page where existing user can login by giving his details i.e username and password and new user has to register the details so that he can login by giving user name and password so that the login is successfull.

In our app vehicle to device connect this the login page which has various options for user i.e new users can use register option and register their details already existing users can use login by entering their details like username and password there is a option for admin login where admin can search the existing user details.

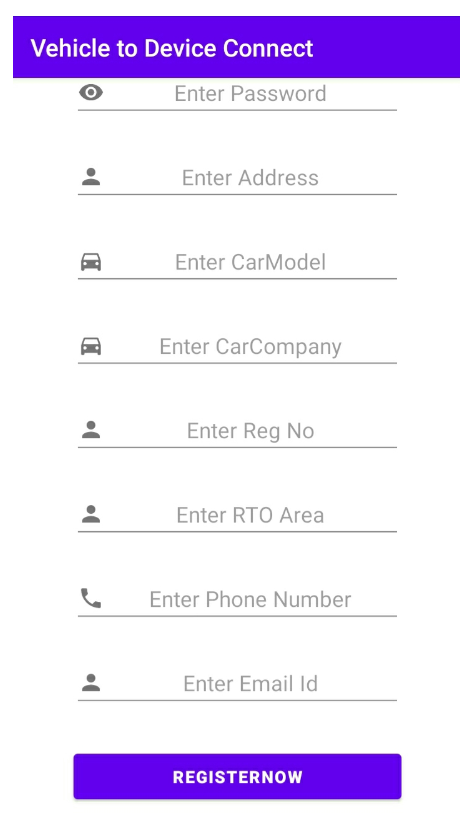


Fig 9.REGISTRATION PAGE

The figure 9 represents registration page where the new user have to register the details himself by giving his name, address, car model, car company, registration number, rto area, phone number, email id etc so that the registration is successful.

By using register option in home page it will be redirected to this registration page where new users are registered by entering their details like name,address etc.

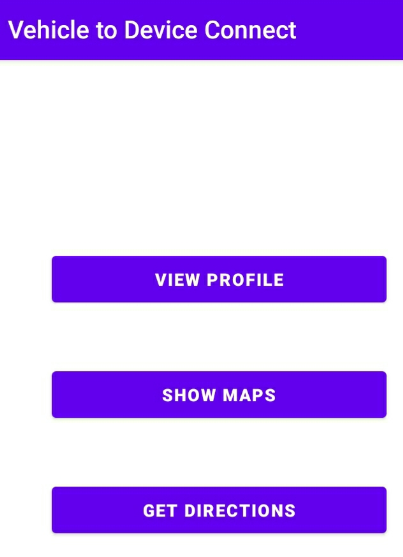


Fig 10. HOME PAGE

The figure 10 represents after successful login home page appearsand where various options are available to the user i.e . as user can view the profile,and get his current location and can search places.

After successful login home page appears where various options are available to the user i.e. user can view his profile, get his current location and can search places.



Fig 11. VIEW PROFILE PAGE

The figure 11 which represents the view profile where user can click the option and can see all the details like car model, car company and rto details without going to rto office to verify his all details which is convenient for user.

By clicking view profile option user can get all his details like car model, car company,rto details etc which makes convenient for user where he can verify all his details without going to rto office.



Fig 12. SHOW MAPS PAGE

The figure 12 is mainly about show maps in this module when user clicks on show maps option he is able to get the access of his current location so that he can know his current location and as this option will be helpful when user doesn’t know his current location.

If user click on show maps option he can get access to his current location so that user can know his current location. this option will be very useful if user don’t know exactly in which location he is in or if he travels to any new place.

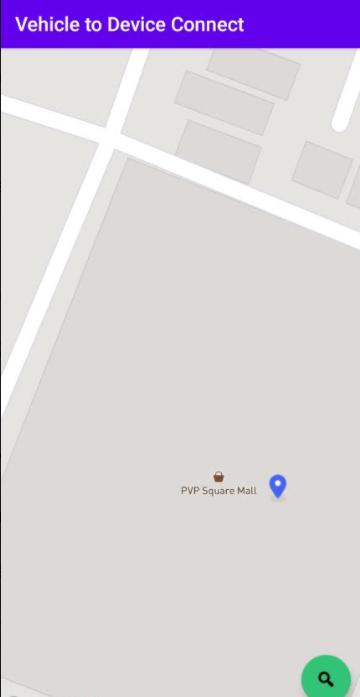


Fig 13. DIRECTIONS PAGE

The figure 13 is mainly about get directions option where we can search the places that he want and he can also be able to get directions from the current location in the app only without getting redirected to the google maps.

If user click on Get Directions Option he can search the places he want and he can able to get directions to the place from his current location in the app only without getting redirected to google maps.

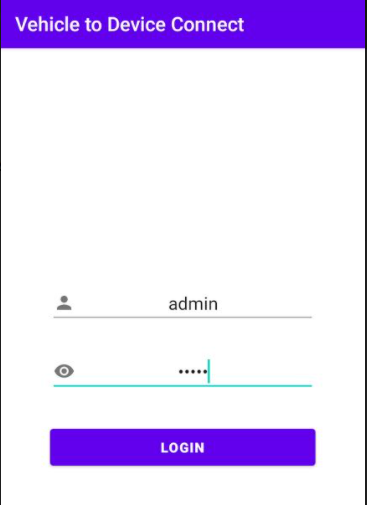


Fig 14. ADMIN LOGIN PAGE

The figure 14 represents admin login where user details is monitored and it has details like how many users are registered and to see all the details are safe and if any user registered multiple times with same details so that there will be no fake login and the all the given details are correct.

Here in our app we have provided admin login to monitor how many users are registered , to see all the details are safe, any user registered multiple times with same details so that there will not be fake login and all the details are correct i.e phone number entered by the user is 10-digit or not etc.

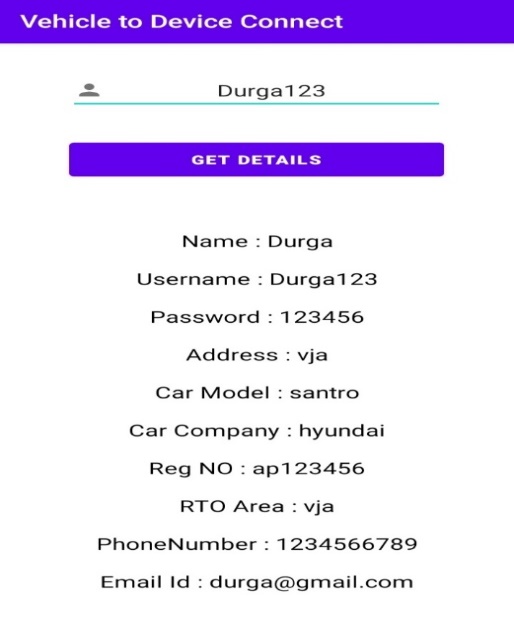


Fig 15.GET DETAILS PAGE

The figure 15 is mainly about get details in this option admin has all the user details by entering their username and if any registered user want their details he can contact admin if in case any user forget their password and their details are stored as no other person can view the details so that there will be no issues.

In the get details option admin can get all the user details by entering username. and if any of the registered user want his details he can contact admin in case where he forgot his registered password and his details are also preserved as no 3rd party can view his details so that there will be no security issues.

**FUTURE ENHANCEMENTS:**

Though our project is itself matured enough but still betterment is always an open door. In this case, also we can add some features to this project in future to make this software more reliable. such as

* Modify the project with more graphics with better approach.
* Filtering the users based on their vehicle type.
* There is a future scope of this facility that can add to many more features such as group chat where users can discuss various issues, thus making it more user-friendly interactive that meets each user's needs in the best possible way.

**CONCLUSION:**

In the recent times the usage of smart applications based on IOV (Internet of Vehicles) had been increased rapidly not only in the developed countries like U.S, U.K but also in developing countries like India, China etc which are user convenient and makes user work very easy. Many car manufacturing companies like MG Hector, Maruti Suzuki are developing their individual applications for their customer convenience. But this usage of smart applications are causing many privacy and security related issues. In this paper we focus on development of IOV system and the security issues related to IOV. In our proposed work we have developed an mobile application which ensures user security and makes user work convenient i.e. to know or verify his details without going to RTO Office. The user of this app can know his current location, can search for nearby places etc. using this app. This app provide multiple options for the registered users so that the users need not provide their data in the unsecured apps that are available online.

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