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Blockchain Based used Vehicle Tracking System

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Abstract: ***The used vehicle market has long been in India, but due to the danger involved in buying an old vehicle without a guarantee and the fact that it lacks certification, it has not been able to make a significant vehicle in the vehicle sector. Purchasing a second-hand vehicle is a risky decision since it is impossible to judge a vehicle just on the basis of appearance if you don't know anything about its history. Many individuals buy vehicles without looking into their past, which frequently results in them getting into legal difficulties. Some people offer vehicles that have been reported stolen with no prior history. Due to them, consumers who wish to purchase a quality used car are duped, which puts them in legal trouble. A solution to this problem is to use a platform that offers the consumer a reliable approach to looking up information about a vehicle, where all vehicle-related data is added in a safe, unchangeable manner. Thus, this issue may be solved via blockchain technology. We are trying to create an Android app that will use blockchain technology to store previous owner data in such a way that it cannot be altered.***

Keywords: Blockchain, peer-to-peer, API, Smart Contract, Digital Ledger.

I. INTRODUCTION

Around the world, buying and selling second-hand vehicles is a common industry. According to reports, 60 million automobiles have been bought in the USA, with around 71.1% of them being used or pre-owned [1]. Customers have a lot of questions before buying a used vehicle, including whether it will be a safe vehicle and why the owner is selling it. It is difficult to believe its various mechanical and electrical components without the answers to these queries, especially for inexperienced customers. a provider of history reports for old vehicles was established in 1984 to address this problem [2]. In order to start in 1996, launched its web-based services, the company CarFax collected data on all vehicles bought in the USA and Canada CarFax claimed in 2015 that its database contains information on more than 20 billion used vehicles. More than 100,000 sources were used to get this data and information [3].The problem is that many of these potential buyers need information about vehicles, starting with its manufacture history, covering its initial sale, any accidents they may have been in, as well as any and all maintenance and repairs. This is necessary for legal and insurance purposes, as well as to maintain a record of the subject vehicle and determine its market worth.

To counter the used-car industry fraud that is being committed. We are aiming to build an Android application that uses API to retrieve all vehicle information and blockchain to keep previous owner information that has been updated by RTO.

II. LITERATURE SURVEY

Blockchain is not a modern innovation. It is a collection of currently used techniques that have been arranged in a certain way to address issues with sharing, security, and various types of strengths. There are several recommended uses to go from a standard or standard operation to a blockchain. Numerous questionnaires were also designed to gather data regarding applications [12]. The following are some of the earlier Driveloop-related works.

Blockchain is characterized as a distributed shared ledger that may act as a store of unalterable data.[6] It is a digital protocol that may securely and immutably record a variety of information, such as financial assets, asset transfers, and contract agreements. [6] Nakamoto claims [7] A blockchain network is a peer-to-peer network where there is no coordinating central authority (CA) and all peers are equal (referred to as "nodes" in the following).

A blockchain network is a peer-to-peer network where there is no coordinating central authority (CA) and all peers are equal (referred to as "nodes" in the following).Everywhere that data has to be securely handled and validated by a third party or intermediary, blockchain technology's potential is unlocked. It can also be taken into account when different people and groups interact and when assets' ownership or properties are monitored throughout time. [8][9].

A number of blockchain implementations made the idea of smart contracts their value proposition. Long before blockchain technology ever existed, in 1996, Szabo Theoretical conditional programme code that executes automatically was given in [11].

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People may communicate without having to put their faith in one another because to a combination of the core concepts of blockchain technology, such as immutability and consensus, and the deterministic, self-executing business logic of smart contracts expressed in code[10][12].

III. BLOCKCHAIN

A. What is a blockchain

The technology underlying Satoshi Nakamoto's cryptocurrency Bitcoin was first described as the blockchain in 2008 [4]. The blockchain is a shared ledger where events are entered and confirmed by network users before being "mined" in a competitive system where participants must successfully complete some proof-of-work, typically a cryptographic challenge.

A simplified representation of the Bitcoin blockchain is shown in Figure 1, drawn from the Bitcoin Developer Guide [5]. The details of a past transaction can only be changed by changing every block mined after that transaction since the contents of previously-mined blocks are hashed and contained into the next block. As a result, a trustworthy transaction record is created that can only be changed by mining power that is in the majority. Apart from PKI, proposed and existing uses for the blockchain include smart contracts and reputation systems. The blockchain offers a special combination of qualities that make it useful for a number of applications. systems, and device-device communication for the Internet of Things. In particular, it is decentralized (no trusted third party is involved in its management), and historical events cannot be changed (without controlling the bulk of the mining power on the network for more information, please see [4]).

B. Advantages of blockchain

The primary advantage of blockchain technology is its decentralised nature. Why is it significant to our lives? It is not essential to collaborate with the central administrator or the third-party organisation, to put it simply. This indicates that there is no middleman in the system, and all users of the blockchain decide what to do. Each system contains a database, which must be protected because when a system collaborates with other organisations, there is a chance that the database might be hacked or that the data could get into the wrong hands. There is a chance that the database security procedure will take a long time and cost a lot of money. Each action is recorded to the Blockchain and the data of records are available to every participant of this Blockchain and cannot be changed or deleted. The results of this recording give the Blockchain's transparency, immutability and trust [14], [16].

Blockchain depends on the trust of two or more people who are outsiders to one another for its reliability. The key concept is that these are genuine, valuable transactions between these unnamed parties. More shared procedures and records have the potential to promote trust [17], [15].

When transactions are approved and distributed across the Blockchain, immutability is achieved. It won't be able to modify or remove a transaction once it is linked to the Blockchain. Additionally, it depends on the kind of system.; if it's centralized, it may be modified or removed because just one person makes the choice. But with a decentralized system, like the Blockchain, every transaction that is connected to the system gets duplicated to every computer in the network. This feature renders the Blockchain technology impermeable and unbreakable. The Blockchain gives its users the capacity to manage all transactions and data. When an attacker gets the fantastic technology, they may edit or delete the data on the Blockchain. Before the next block is written here, there is enough computational power to replace or wipe all of the data on the world's computers, including that including that in the blockchain.

If there are few computers in the Blockchain, the technology is more vulnerable to attack; conversely, if there are many computers, the system is safer and more transparent [14], [16], [17], [18], [15].

The replication of transactions is how the Blockchain achieves transparency. Each transaction is replicated to one of the computers in the Blockchain network, as was stated before. Every participant has access to view all transactions, which also means that every activity is visible to Blockchain users. Nobody is incapable of acting irresponsibly[17], [18]. The Blockchain is built so that it can identify any issues and, if required, fix them. This benefit increases the traceability of Blockchain technology. [19]. Participants in the system experience clutter and complexities as a result of the various ledgers.

The ecosystem is simplified by blockchain technology since every transaction is added to a single public ledger. The quicker processing is the final benefit.

Processing and initialling the transaction into the financial institution traditionally takes a long time. Utilizing blockchain technology allows for significant time reductions in processing and initialization, going from three days to a few minutes or even seconds.[18], [19].

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C. Use of blockchain in Project

1) We are using blockchain because of its Immutability feature.
2) Immutability means that the blockchain is a permanent and unalterable network.
3) We are using this concept to store the previous owner details and to save the transaction between the previous plus a new owner of the vehicle.

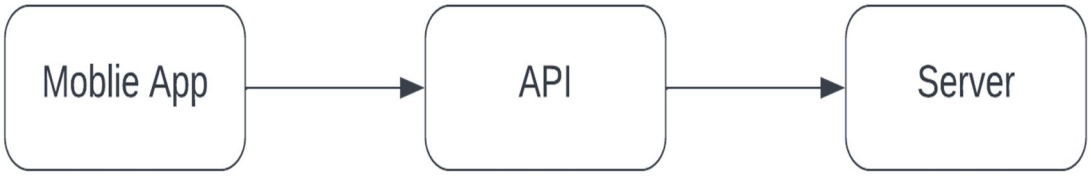
IV. API

A. What are an APIs

The application programming interface is referred to as API. An API is a protocol that enables users to make requests of resources, obtain data in a machine-readable format, and download it.

You access an API each time you use a mobile app like Facebook, send a sms alert or check the weather.

When you use a mobile application, it connects to the Network and sends information to a server. The data was subsequently retrieved, processed, put to use, and sent returned to your phone by the server. The program me then analyses that data and presents the results you requested in a comprehensible way. What an API actually is



dig.1.API

B. Advantages of APIs

1) Applications: Access to APIs ensures more flexibility in information-transfer processes.
2) Reach: APIs let you create layers in apps in order to distribute information to different audiences.
3) Customization: Furthermore, it can serve as a solution to create different experiences for users, letting protocols, functions, and commands be adapted according to specific demands.
4) Efficiency: When you have content that is automatically published and made available on different channels simultaneously, APIs allow for more efficient data distribution.
5) Adaptability: One of the greatest benefits of APIs is the ability it has to adapt to changes through data migration and flexibility of services.

C. Use of API in Project

To get the vehicle data in a safe manner, we are using an API. From which we fetch the required data which we are using in our android app vehicle footprint.

Our use of the Vehicle RC verification API reduces the chance of fraud by creating a relationship between the vehicle and its owner.

We use API to get the following information:

"result":{"extraction_output":{"noc_valid_upto":null,"seating_capacity":"10","fitness_upto":"2016-07-24","variant":null,"registration_number":"MH04AA1234","npermit_upto":"1900-01-01","manufacturer_model":"TATA SUMO","standing_capacity":"","status":"id_found","status_message":null,"number_of_cylinder":"4","colour":".","puc_valid_upto":"1900-01-01","vehicle_class":"LMV","permanent_address":"R NO 5 PARAVTI NIWAS, SEC 11 JUHU GAON, NAVI MUMBAI, -0","permit_no":"","father_name":"RAJU SHETTY","status_verfy_date":"2022-10-13","m_y_manufacturing": "6/1996","registration_date":"1996-07-17","gross_vehicle_weight":"0","registered_place":"VASHI (NEW MUMBAI), Maharashtra","permit_validity_upto":"1900-01-01","insurance_policy_no":"D007082220","noc_details":"","npermit_issued_by":"","sleeper_capacity":"","current_address":"R NO 5 PARAVTI NIWAS, SEC 11 JUHU GAON, NAVI MUMBAI, -0","status_verification":"Fitness Expired","permit_type":"","noc_status":null,"masked_name":false,"fuel_type":"DIESEL","permit_validity_from":"1900-01-

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01","owner_name":"ARVIND SHETTY","puc_number":"","owner_mobile_no":"","blacklist_status":"","manufacturer":"TATA MOTORS LTD","permit_issue_date":"1900-01-01","engine_number":"483DL41FTQ769014","chassis_number":"385003FTQ921274","mv_tax_upto":"2099-12-31","body_type":"SALOON","unladden_weight":"1700","insurance_name":"GoDigit General Insurance Ltd.","owner_serial_number":"7","vehicle_category":"LMV","noc_issue_date":null,"npermit_no":"","cubic_capacity":"1948.00","norms_type":"Not Available","state":null,"insurance_validity":"2020-08-14","financer":"","wheelbase":""}}

Sr no	Keyword	Description
1	Manufacturer_model	The manufacturer model it is model name and number of car
2	Registration_number	The Registration number a sequence of letters and numbers assigned to a vehicle
3	Fitness_upto	A government-issued document called the Fitness up to certification of health for vehicles certifies that the vehicle is in good sufficient physical shape to be driven on public roads.
4	Colour	It is colour of our vehicle
5	Vehicle_class	Vehicle class means the designation of motor vehicle
6	Permanent_address	The address of your initial home, which is also the address of your hometown, is your permanent address.
7	Insurance_policy_no	The insurance policy is a contract between the insurance provider and the policyholder, typically in a standard form. we get the insurance policy no.
8	Fuel_type	a class of power-driven vehicles that share the same basic engine and vehicle components
9	Owner_name	Identifies the user who is the owner of the schema
10	Blacklist_status	Get the detailed if the vehicle is blacklisted at a particular region.
11	Manufacturer	A manufacturer is a corporation or organization that produces products in big quantities for retail sales.
12	Chassis_number	The Chassis Number, meaning VIN, is a unique automotive identification number that is assigned to your vehicle by the manufacturers.
13	Vehicle_category	For regulatory purposes, a land vehicle is classified by a vehicle category.
14	Insurance_validity	Valid insurance means a valid policy, or other evidence of insurance.
15	Current_address	current address means, at a point of time, the address at which a person resides at such time.
16	Car_owners_number	Check whether the car is 1st hand 2nd hand or 3rd hand
17	Engine_number	an identification number marked on the engine of a vehicle
18	Insurance_name	When you buy insurance, you purchase protection against unexpected financial losses
19	Registered_place	Whether car has been registered.

fig.2.API Table

V. SYSTEM FLOW DIAGRAM

Following are the System flow diagrams which shows the flow of the application vehicle footprint. There are two stockholders of the application:

1) *User:* User is a person who what's to buy a secondhand vehicle and wants the check the details regarding the vehicle like insurance details, owner details, how many previous owners where there, etc.
2) *RTO:* RTO is a person who fill the previous owner details on the blockchain. By which user can get the previous owner names and other details.

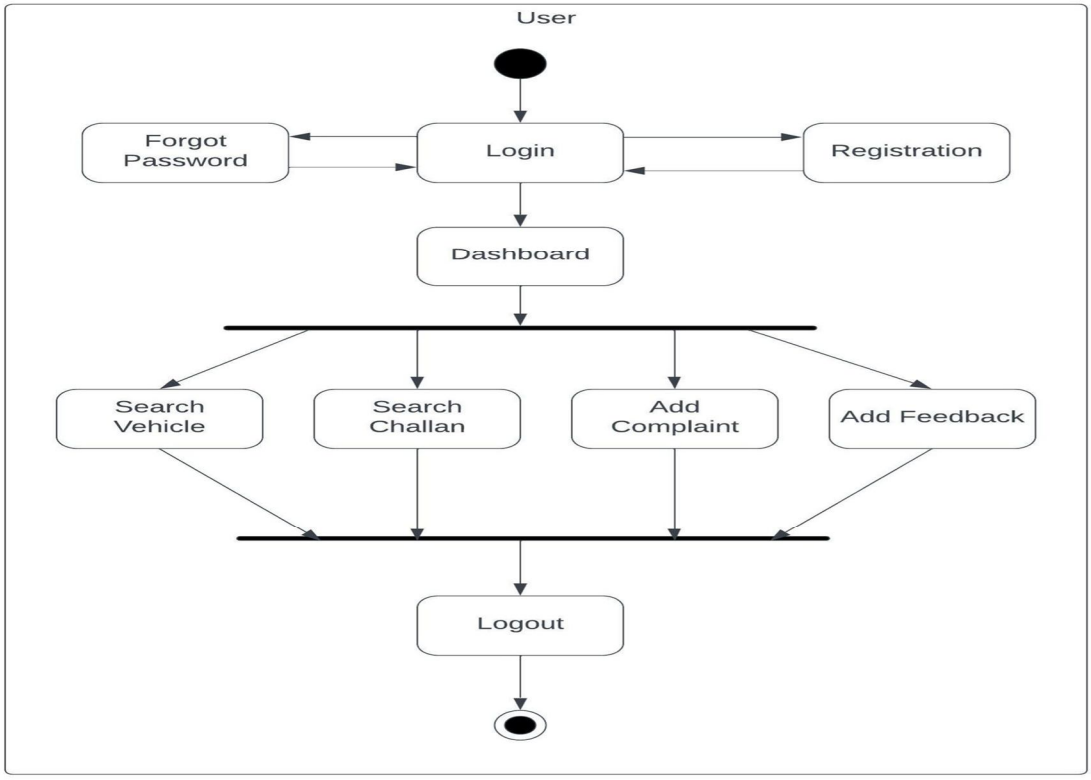


fig.3. User System Flow

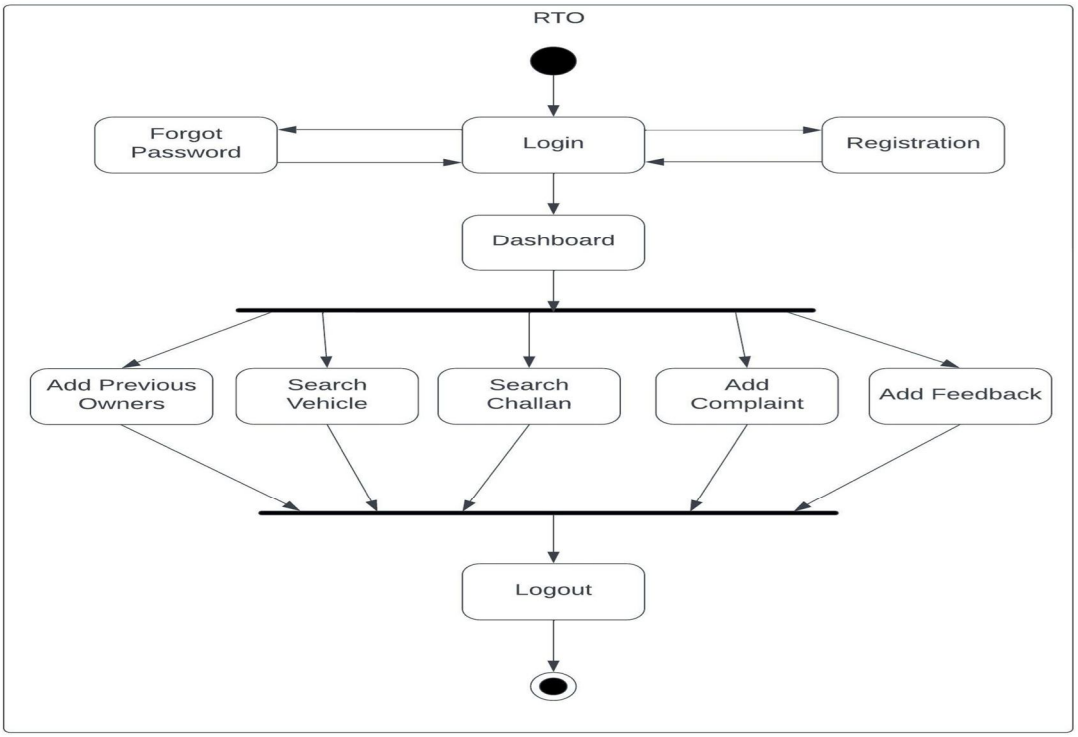


fig.4.RTO System Flow

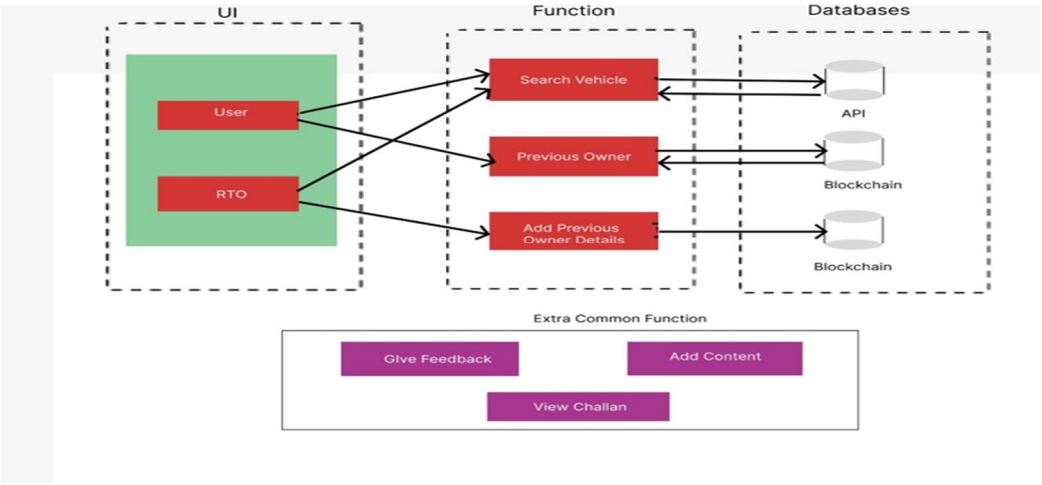


Fig.5. Application working

VI. USE CASE DIAGRAM

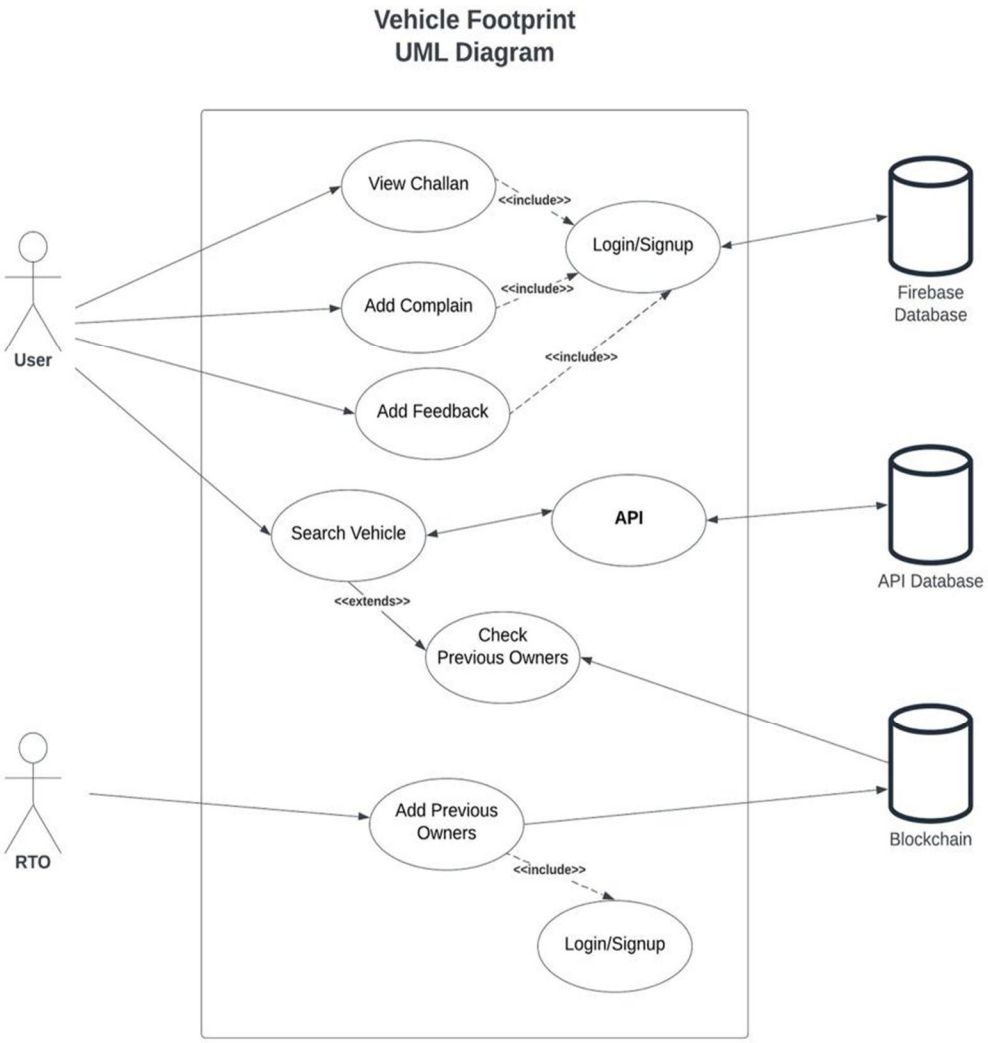
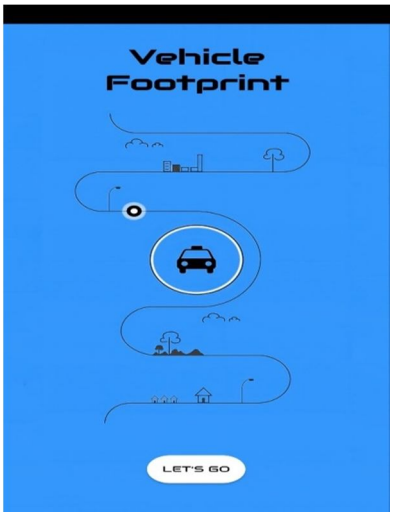
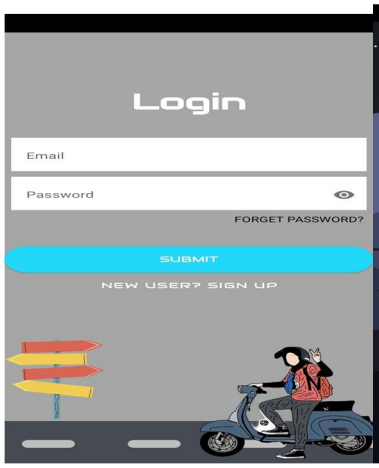


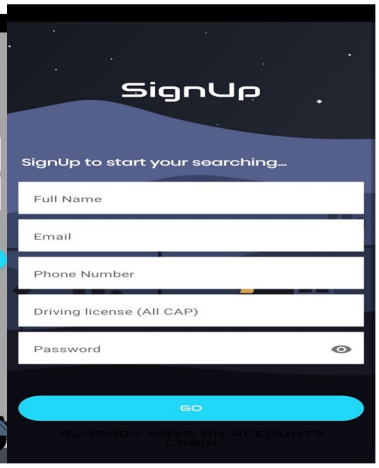
fig.5. Use case Diagram

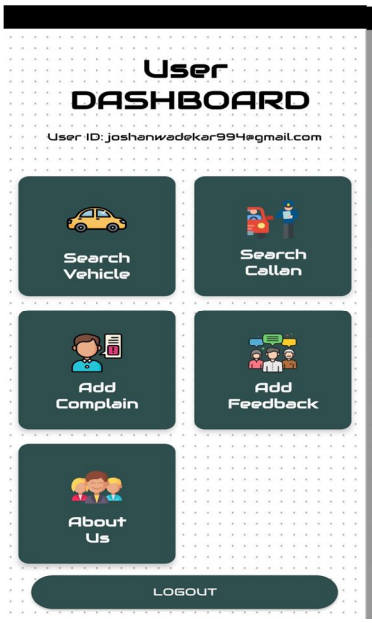
VII. OUTPUT

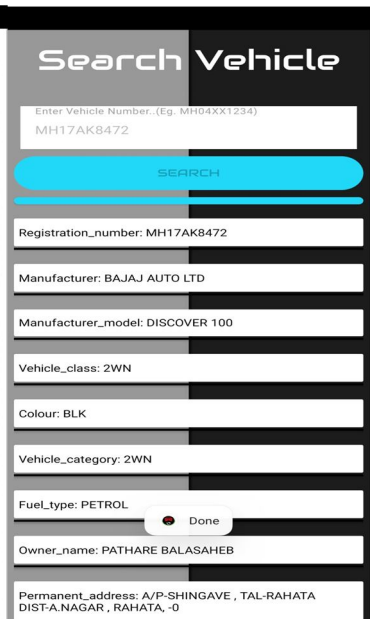

Vehicle Footprint
LET'S GO

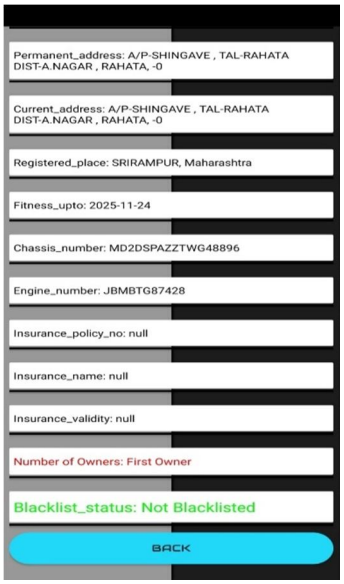

Select Type
USER
Authority

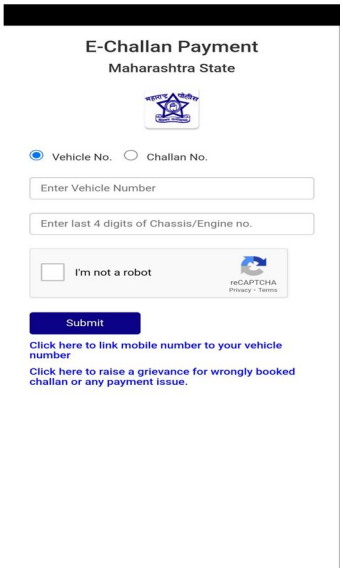

Login
Email
Password
FORGET PASSWORD?
SUBMIT
NEW USER? SIGN UP

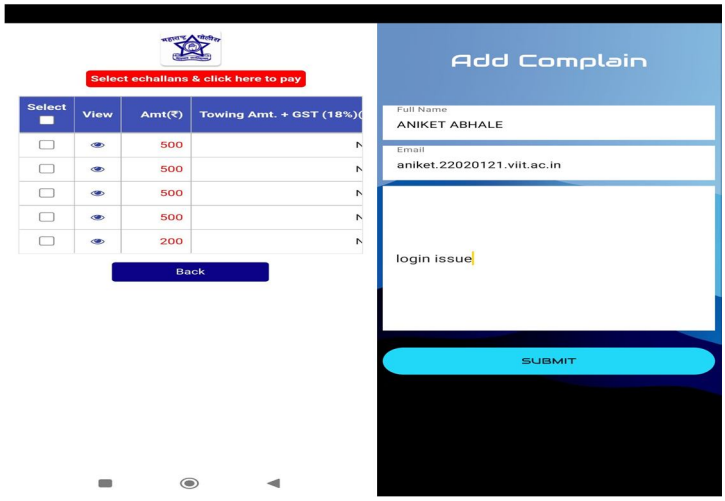

SignUp
SignUp to start your searching...
Full Name
Email
Phone Number
Driving license (All CAP)
Password
GO

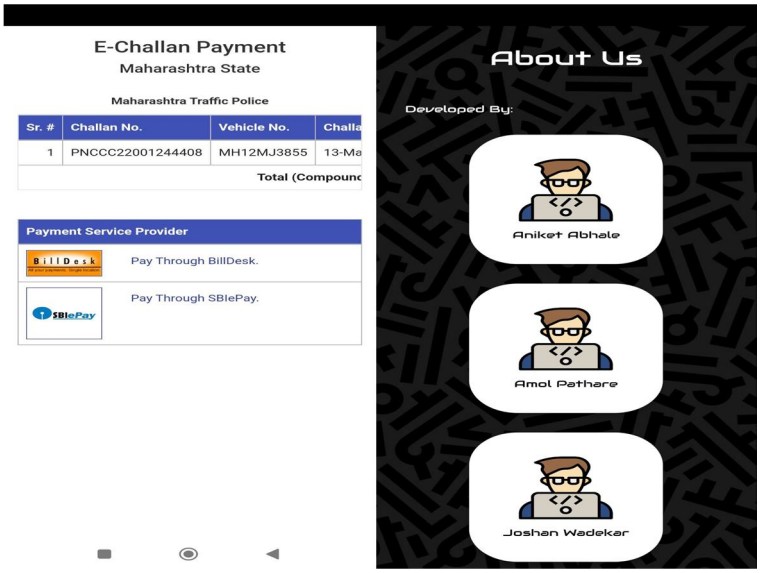

User DASHBOARD
User ID: joshanwadekar994@gmail.com
Search Vehicle
Search Callan
Add Complain
Add Feedback
About Us
LOGOUT


Search Vehicle
Enter Vehicle Number..(Eg. MH04XX1234)
MH17AK8472
SEARCH
Registration_number: MH17AK8472
Manufacturer: BAJAJ AUTO LTD
Manufacturer_model: DISCOVER 100
Vehicle_class: 2WN
Colour: BLK
Vehicle_category: 2WN
Fuel_type: PETROL
Done
Owner_name: PATHARE BALASAHEB
Permanent_address: A/P-SHINGAVE , TAL-RAHATA DIST-A.NAGAR , RAHATA, -0


Permanent_address: A/P-SHINGAVE , TAL-RAHATA DIST-A.NAGAR , RAHATA, -0
Current_address: A/P-SHINGAVE , TAL-RAHATA DIST-A.NAGAR , RAHATA, -0
Registered_place: SRIRAMPUR, Maharashtra
Fitness_upto: 2025-11-24
Chassis_number: MD2DSPAZZTWG48896
Engine_number: JBMBTG87428
Insurance_policy_no: null
Insurance_name: null
Insurance_validity: null
Number of Owners: First Owner
Blacklist_status: Not Blacklisted
BACK


E-Challan Payment
Maharashtra State
Vehicle No.
Challan No.
Enter Vehicle Number
Enter last 4 digits of Chassis/Engine no.
I'm not a robot
Submit
Click here to link mobile number to your vehicle number
Click here to raise a grievance for wrongly booked challan or any payment issue.


Select echallans & click here to pay
Select
View
Amt(₹)
Towing Amt. + GST (18%)
500
500
500
500
200
Back
Add Complain
Full Name
ANIKET ABHALE
Email
aniket.22020121.viit.ac.in
login issue
SUBMIT


E-Challan Payment
Maharashtra State
Maharashtra Traffic Police
Sr. #
Challan No.
Vehicle No.
1
PNCCC22001244408
MH12MJ3855
Payment Service Provider
Pay Through BillDesk.
Pay Through SBIePay.
About Us
Developed By:
Aniket Abhale
Amol Pathare
Joshan Wadekar

VIII. CONCLUSION

Vehicle footprint is an android app which uses API and blockchain to get the immutable data regarding the searched registration number of the vehicle.

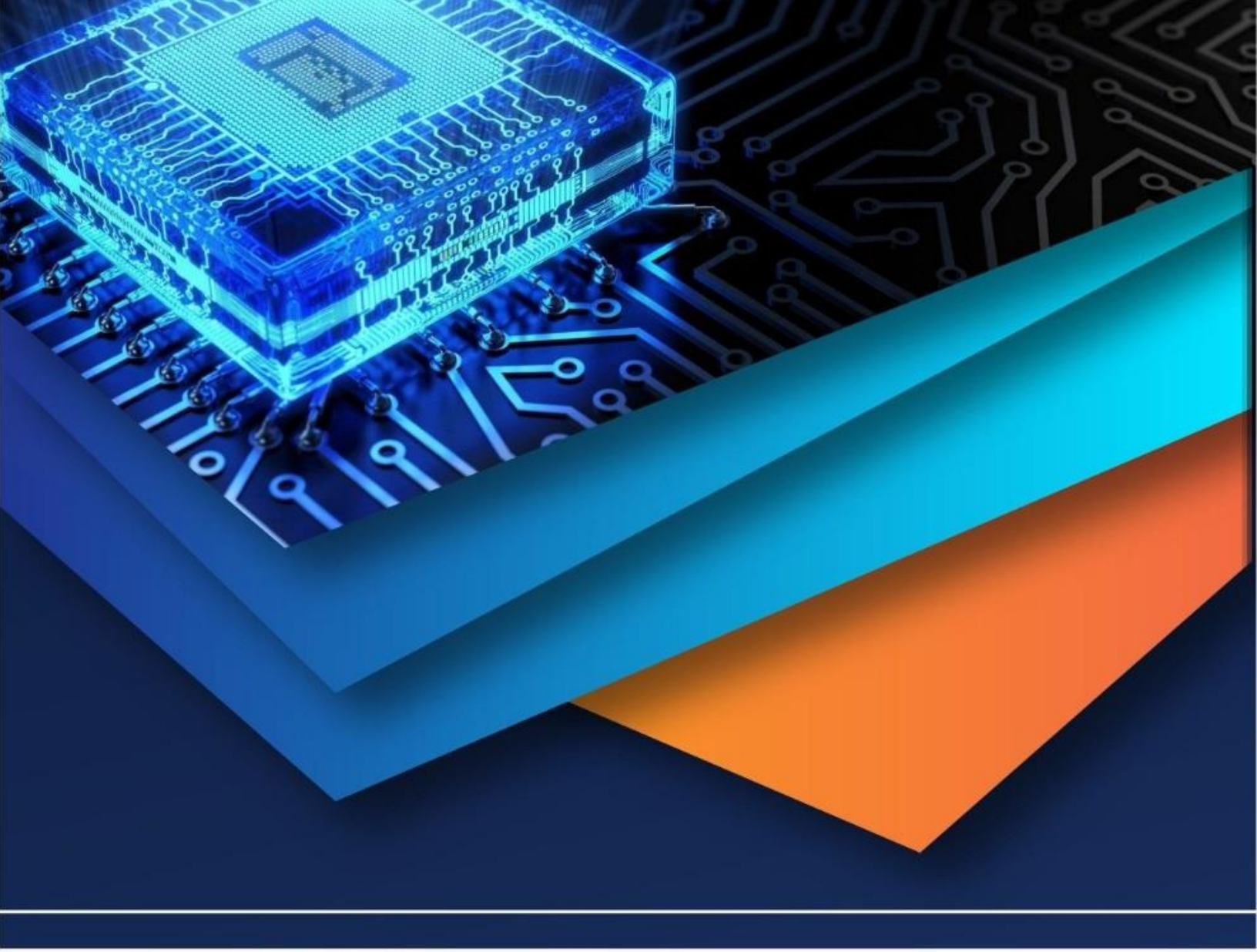
Because of this application a huge problem of vehicle fraud will we minimize.

Using this application its user will get the genuine information about the vehicle. And user will also able to check the pending challan details so they can inform the owner about the pending challan before buying the vehicle.

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