

Survey on Peer to Peer Car Sharing System Using Blockchain

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Abstract – By giving people access to shared vehicles and limiting the use of private automobiles, car-sharing programs can help with a number of urban challenges. People may now utilize a shared automobile by performing basic operations on their mobile devices thanks to the growth of the Internet of Things. The car-sharing program, however, has security issues. Sensitive data is communicated for car-sharing via a public channel, including the user's identification, position data, and access code. As a result, an attacker may be able to obtain this data for improper reasons, making the development of a secure authentication protocol crucial.

Key Words: Car Sharing, automobiles, authentication, blockchain .

1. INTRODUCTION

In order to deal with urban transportation issues including road congestion and fuel combustion pollution, car-sharing programs were created. Carsharing is a substitute for owning a vehicle that enables people to increase their mobility without having to pay for upkeep and storage. Peer-to-peer (P2P) carsharing is a cutting-edge shared-use vehicle concept in which individuals in the neighborhood have access to privately owned vehicles. P2P start-ups are a part of a group of internet businesses that have promoted the development of "collaborative consumption" and the "sharing economy" ideas. P2P vehicle sharing is one of several shared-use mobility services that are concentrated on sharing transportation resources, and the sharing economy is emerging as a more significant force in society..

The P2P service model is a system where automobile owners turn their own vehicles into shared cars and rent them out to other customers.

In a conventional car-sharing system, a centralised service server can store and manage user data as well as service data. A centralised server, however, is vulnerable to a malevolent attacker's single point of failure. For instance, if the service server is hacked and all the sharing records are wiped, the user won't be able to access the earlier data matching to the information about the used cars when anything goes missing from the cars. Additionally, if the user engaged in fraudulent activity during car-sharing, or if the sharing records are altered. Finding the user's proof of a

crime from these recordings is challenging. Additionally, if the information that has been saved has been compromised, it poses a major risk to user privacy.

1.1 Literature Survey

System analysis is a thorough assessment of the system's many systems, as well as their interactions both inside and outside the system. Why are there so many faults in the present system is the crucial query here. What actions need to be performed to fix the issue? The analysis starts when a user or administrator launches a software survey on the live system. The information is gathered through a variety of files, decision-making processes, and analysis-related activities carried out by the present system. Example Data Stream The method makes extensive use of drawings and other media. Training, expertise, and common sense are needed to obtain the crucial data needed to create a system.

The way in which the problem is discovered, thoroughly read, and properly executed by choosing a solution, is essentially what determines the effectiveness of the system. A good analytical model should provide a framework for solving the problem in addition to methods for understanding it. As a consequence, further information should be looked into through gathering system-related data. The needs of the proposed system should then be carefully assessed. There are four sections in the system analysis.

1. Initial analysis and system layout.
2. Performing systematic analysis with the use of analytical tools.
3. A study of the possibilities.
4. Examine the expenses and advantages.

2. PROPOSED SYSTEM

The proposed protocol will protect users from man-in-the-middle, replay, offline password guessing, impersonation, and stolen mobile device threats. By doing a loose security analysis, the suggested protocol offers reciprocal authentication, anonymity, and secrecy. Comparisons were made between the proposed protocol's performance and similar systems. The suggested protocol may be used in the blockchain-based car-sharing system and is effective. The

protocol will eventually be tested and applied to a genuine car-sharing system using a simulation. The suggested car-sharing system authentication technique was built on the blockchain and consists of five entities: the trust authority, stations, owners, vehicles, and users.

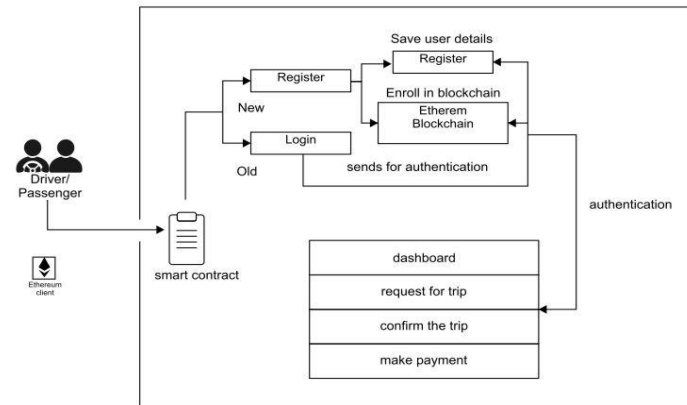


Chart -1: Flowchart

Advantages:

Blockchain provides a high degree of security due to independent verification procedures that occur across all participating computers on a blockchain network. In situations involving digital currencies, this verification is used to validate transaction blocks prior to their inclusion in the chain.

1. Fast, Secure, and Efficient Transactions
2. Transparent and Accurate Pricing Model.
3. Less work is required thanks to online reservation tools.
4. Traveling is simplified.
5. Strengthened Security and Privacy Standards.

3. Future Work

Although blockchain may be used independently, its effectiveness is expected to be better when combined with other technologies like the Internet of Things, artificial intelligence, and big data. Better answers for location-based automobile services might result from this. Future extensions of the study include I an analysis of the application's performance and cost. Since blockchain technology is a trust-free system that enables consumers to trust data, it is also important to examine the technology from the standpoint of data processing. Although blockchain technology generally improves data quality, it is crucial to understand the data processing capabilities when connecting the blockchain with a larger software system. iii) Examine the data processing workloads across various blockchain architectures.

4. CONCLUSIONS

As a solution to the mobility issues in metropolitan areas, car-sharing programmes have garnered a lot of interest. However, the centralised system structure and communication over a public channel of the conventional car-sharing system expose it to various security issues. In order to provide a decentralised sharing service for authorised users, this article presented a safe decentralised model of a car-sharing system as well as a secure authentication technique. Blockchain was utilised to offer a decentralised car-sharing service and guarantee the accuracy of service information. In order to ensure the user's privacy, a pseudonym was also used in the car-sharing system. As a result, even if the adversary accesses the stored data, they are unable to determine the user's true identity. The suggested protocol may enable safe mutual authentication between the user, station, and owner, according to BAN logic analysis, which was used to demonstrate this. Additionally, the suggested protocol's security against replay and man-in-the-middle attacks was shown using the AVISPA simulation.

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