

Block Chain Adoption in The Vehicle Leasing Business to Increase The Transparency of Transactions

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Abstract

The motor automobile rental industry provides entrepreneurs with substantial revenues and customers with several advantages. Consumers may utilize the car whenever and wherever it is required without incurring maintenance, insurance, or other expenditures. However, this vehicle rental industry frequently involves a number of other parties in automotive vehicle rental transactions, which has the effect of raising the overall operational expenses charged to entrepreneurs or customers. With private blockchain technology administered by businesses, automobile owners, and insurance companies, a car owner no longer need a third party in order to rent his vehicle. Smart contracts may be used by renters and automobile owners to conduct transactions with mutually agreed upon terms. Blockchain makes data management simpler. The automobile owner's whole trip history is stored on the blockchain, allowing auto insurance firms to make more accurate evaluations. Using smart contracts makes the process of submitting insurance claims quicker and more precise. A team of mechanics merely examines the most recent automotive data recorded on the blockchain to determine the vehicle's condition. Car-related financial transactions are also streamlined by blockchain technology. Various subscription services, such as automobile insurance, parking rental, toll road payments, and vehicle inspections, may be automated with smart contracts, and payments can be done with cryptocurrency, saving time and money. Consequently, the purpose of this study is to assist automobile owners in renting out their vehicles utilizing blockchain technology. Observation is used as a qualitative research tool to discover difficulties in the automobile rental industry. A literature review is performed to identify alternative information technology-based solutions.

Keywords

Blockchain, Vehicle Rental Business , Transparency of Transaction.

1. Introduction

Automobile rental is an organization that provides car rental services to people and businesses. Renters are not responsible for automobile maintenance, but car rental owners play a vital role in preserving the vehicle's condition, as the key to car rental success is lowering maintenance expenses. In addition to being perceived as more practical, renting an automobile is actually pretty simple, so long as customers match the company's or car renter's standards. Additionally, the public or consumers are not required to own a vehicle (Hassija et al. 2019) (Martin et al. 2019) (Langbroek et al. 2019). Nonetheless, the vehicle rental sector usually involves a number of other parties in motor vehicle rental transactions, which has the consequence of increasing the overall operational costs imposed to entrepreneurs or consumers (Valastin et al. 2019) (Chen et al. 2020)

Using private blockchain technology operated by enterprises, automotive owners, and insurance agencies, a car owner can rent his vehicle without a third party. Lessees and automotive owners can utilize smart contracts to perform transactions with mutually agreed upon parameters. Blockchain simplifies data management. The whole travel history of the vehicle's owner is maintained on the blockchain, allowing auto insurance companies to make more accurate assessments. Using smart contracts expedites and improves the process of submitting insurance claims. A group of technicians evaluates the most current automotive data published on the blockchain to determine the condition of a car. Blockchain technology also simplifies financial transactions involving automobiles. Various subscription services, including auto insurance, parking rentals, toll road payments, and vehicle inspections, may be automated with smart contracts, and payments can be made with bitcoin to save time and money. Therefore, the objective of this study is to help car owners in renting out their automobiles using blockchain technology. Observation is employed as a qualitative research method to identify issues within the vehicle rental sector. Literature research is conducted to explore alternate solutions based on information technology.

2. Literature Review

2.1 Business of Vehicle Leasing

Business automobile leasing resembles personal car rental in many ways. It comprises an agreement between the leasing firm and the customer to locate the ideal vehicle for the customer's business needs. After the first payment, the consumer makes a lesser monthly payment for a certain period, which is often 24, 36, or 48 months. The consumer does not have complete ownership of the car. When this contract expires, the customer has the option of returning the vehicle without concern that it will be resold or not used again. The customer can then select a new commercial vehicle and restart the lease (Huang et al. 2021) (Thakur 2021) (Alabdulkarim 2018).

Leasing provides benefits to both buyers and sellers. For the buyer, lease payments are often less expensive than auto loan installments. In most states, sales tax is assessed solely on each monthly payment, as opposed to the total purchase price in the case of an installment sale or loan. Some consumers may prefer leasing since it allows them to return a car and pick a new model when the lease ends, allowing them to drive a new vehicle every few years without having to worry about negative equity, unlike when trading in a vehicle after only two or three years of ownership. The leased car is theoretically always covered by the manufacturer's guarantee; thus, the lessee is not responsible for repairs. A lessee is not responsible for the car's future worth, but a vehicle owner is (Fota et al. 2019). Almost all leases feature a predetermined purchase price at the conclusion of the lease, allowing the lessee to purchase the vehicle if it is worth more than the estimated value, or return it if it is worth less. There are tax benefits to consider for a company lessor (Solanke et al. 2021) (Safarova 2021) (Molina 2020) .

Over the life of the lease, the consumer pays less sales tax than when purchasing the car. For the seller, leasing creates cash from a vehicle that the seller (or manufacturing business or its financial subsidiary) still owns and may lease again or sell through vehicle remarketing once the initial (or primary) lease expires. As consumers would normally use a leased car for a shorter duration than one, they purchase outright, leasing may produce repeat customers more rapidly, which may fit into different components of a dealership's business strategy. Additionally, lessees are more loyal to the same car manufacturer than purchasers. Manual on Automobile Lending and Leasing Figure 1 show the car lease conventional mechanism (Ankey and Benjamin 2021) (Ermakova et al. 2020) (Ankey 2021).

Typical lease agreements include a cost for early termination and mileage restrictions (for passenger cars, a common number is 10,000 miles per annum though the amount can be stipulated by the customer and can be 12,000 to 15,000 miles per year). If the mileage limit is exceeded, additional costs may apply. Typically, dealers will permit lessees to negotiate a larger mileage allowance in exchange for a higher lease payment. In most lease agreements, the permissible amount of vehicle wear is specified, and the lessee may incur a cost if this limit is exceeded. A lease with maintenance may include all vehicle operating costs except for gasoline and insurance. In some instances, the car leasing system may be short-term. Event management organizations utilize this short-term leasing mechanism (Huang et al. 2021). The actual lease payments are computed in a manner very similar to that of loan payments; however, an entity known as the money factor is used in place of an annual percentage rate. At the conclusion of a lease, the lessee must either return the car to the owner or purchase it. Typically, the end of lease price is negotiated at the time the lease is signed. Typically, a leasing firm will have a minimum lease term of between 24 and 60 months. The market for short-term leases known as "flexi-lease" has expanded recently, according to a fresh perspective on leasing. Flexi-lease is when a person can lease a new vehicle for three months and then return or extend the lease for an additional time. This is like van rental; however, the financing or leasing business normally maintains and is ultimately accountable for the vehicle (Nechaev et al. 2021).

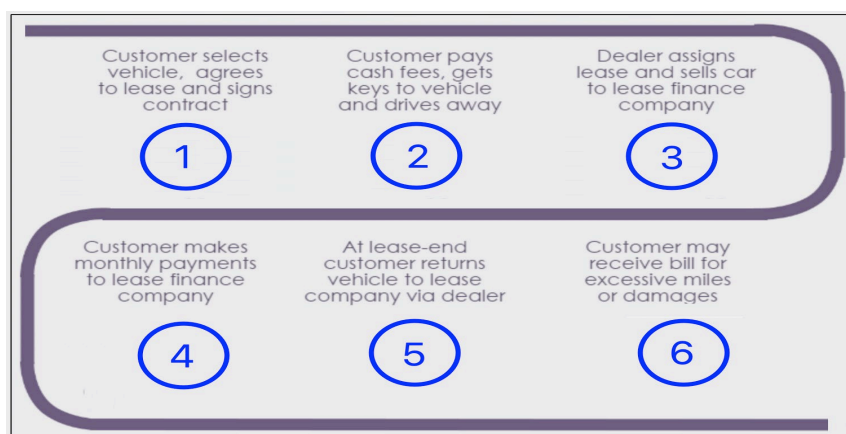


Figure 1. Car Lease Conventional Process

2.2 Block chain Technology

Blockchain is a collection of data records controlled by a network of computers not owned by a single company. Using cryptographic principles, these distinct data blocks are safeguarded and bound together (Inayatulloh 2020) (Lee et al. 2022) (Mamun 2022).

Because it contains shared and immutable ledger records, the network has no central authority and all of its information is accessible to anybody who wishes to view it. Because of this, everything constructed on the blockchain is essentially transparent, and each participant is accountable for their own acts. In addition, blockchain has no transaction costs, such as infrastructure fees. Therefore, blockchain is the easiest and most intelligent means to automatically and securely transmit information from A to B. Its blocks are disseminated throughout the internet after being validated by millions of computers. These validated blocks are then added to the chain and circulated across a specialized network, so generating a unique record and history (Inayatulloh 2021) (Tanwar et al. 2020) (Bosamia et al. 2020).

In its most basic form, blockchain is a digital ledger that records transactions. The sole distinction between a blockchain and a personal ledger is the presence of a security check. Before permitting a miner to make modifications to a specific block, a blockchain performs various security checks. It will validate signatures, request the miner to solve the hash code, cross-check the data, and then enable the system modifications. The stringent security of a blockchain prevents hacking and fraud within the network. Blockchain maintains a record of past transactions and has a designated location for future transactions. It is a digital database, a peer-to-peer network that prioritizes the security of transactions. As blockchain is a database, millions of users may keep their information on it (Inayatulloh 2022) (Raja et al. 2022) (Rajasekaran et al. 2022).

3. Methods

The research was started by observing the car rental business. Based on observations of these business processes, several problems were found, such as low transparency of transactions between parties involved in the car rental business and high administrative costs to support business operations. After finding the problem in the business, the research continued by identifying alternative solutions with information technology. The low transparency of transactions which is the root of the problem can be solved with blockchain technology so that blockchain technology is the solution to the problem of the car rental business. On the other hand, blockchain can also reduce business operational costs so that it can increase the effectiveness of the company's business efficiency. The final stage of this research is to build a blockchain architectural model to increase transaction transparency in the car rental business.

4. Results and Discussion

Figure 2 show the proposes model. The model describes the process or mechanism for the integration of 3 parties involved in the vehicle rental business, namely tenants, vehicle leasing companies and insurance companies on a blockchain network. The detailed explanation is as follows.

1. The blockchain system stores the renter's data in a block and after passing the validation and encryption process the block containing the renter's data is stored on the blockchain network.
2. The blockchain system stores vehicle leasing company data and after passing the validation and encryption process the block containing the data renter is stored on the blockchain network.
3. The blockchain system stores insurance company data and after passing the validation and encryption process the block containing the data renter is stored on the blockchain network
4. The blockchain system will integrate all data from the three parties involved in this business and each party becomes a node where each node will validate all transactions transparently and in real time.
5. The agreement between the renter and the vehicle leasing company is stored in the smart contract which is part of the blockchain and after passing the validation and verification process it will be stored on the blockchain network.
6. The blockchain system also stores an agreement between a vehicle rental company and a vehicle insurance company, where the agreement is stored in a smart contract that is part of the blockchain network.
7. Payment processing and claim processing between renters and vehicle leasing companies are stored in smart contracts and validated by all nodes on the blockchain network. The same process applies between vehicle leasing companies and vehicle insurance companies.

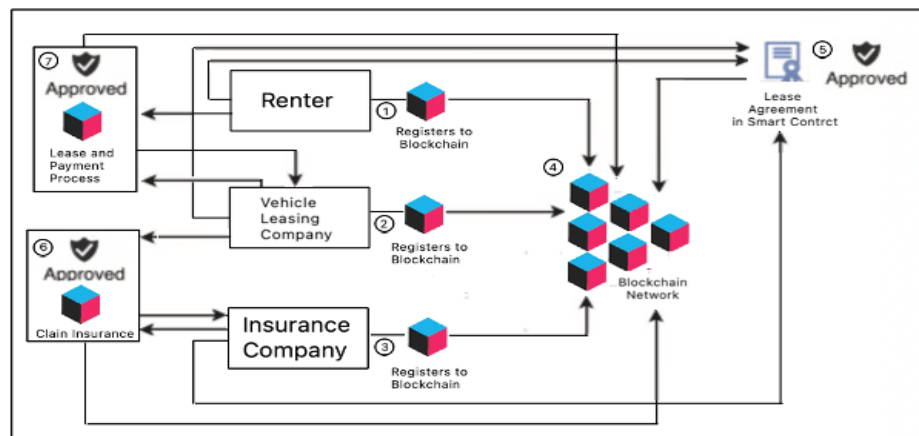


Figure 2. Blockchain Model for Car Leasing Company

5. Conclusion

The implementation of DSS.

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