Chapter 4
A Framework for Cheque Processing Using Blockchain Technology and Smart Contracts

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ABSTRACT

Processing checks has long been an integral element of the banking industry, allowing for safe and hassle-free money transfers. However, there are several issues with the efficiency, timeliness, and openness of the conventional ways of processing cheques. This study presents a system for cheque processing that makes use of blockchain technology and smart contracts to address these problems. Blockchain's immutability and decentralization, together with smart contracts' automaticity and programmability, are used in this framework to improve the process of checking. The architecture uses a distributed ledger to guarantee openness, safety, and auditability at every stage. To facilitate streamlined and unchangeable record-keeping, this framework proposes to digitize checks and represent them as unique tokens on the blockchain. Cheque verification, permission, clearing, and settlement are just some of the processes that may be automated with the use of smart contracts.

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INTRODUCTION

The prevalence of online shopping and business has led to an increase in the use of third-party payment processors. Third-party financial institutions have drawbacks, such as high fees, lengthy processing times, and security risks (Adhikari & Singla, 2021). In order to resolve disagreements via mediation, it is not necessary to prevent the transaction from becoming irreversible (Balu & Sriram, 2020). If the transactions are being conducted in person and with cash, none of these problems will arise (Bhakuni, 2023). Since that is rapidly evolving, a new decentralized mechanism is required to ensure that all transactions are completed without any instances of fraud (Bhardwaj & Rawat, 2021). The epidemic has increased the need to develop cutting-edge security systems (Debnath & Ghosh, 2019). In 2008, a similar proposal for an electronic payment system was made. It was suggested by an anonymous organization calling them Satoshi Nakamoto (Chaturvedi & Tiwari, 2019). The idea by Satoshi and the group set out to create a cryptographically secure electronic system that would let the parties conduct transactions directly with one another (Debnath & Ghosh, 2019). The breakthrough resulted in the development of something called "Blockchain technology." The widespread use, scalability, usefulness, and convenience of this technology have led to its increased adaptability (Jaiswal & Ghosh, 2020). This innovation eradicates the need for a financial go-between by eliminating the possibility of duplicate expenditure (Kanike, 2023). It's a standard for trading Bitcoin and other cryptocurrencies. Bitcoin was the first digital money to use this system. It offers a probabilistic solution to "The Byzantine Generals Problem," a classic topic in computer science that calls into question the consensus of distributed systems (Komperla, 2023). Many additional cryptocurrencies emerged and gained traction (Li et al., 2020).

Cryptocurrencies

- Bitcoin: It is the bitcoin industry's de facto benchmark. Bitcoin is the world's first cryptocurrency. To do business involving the exchange of currency between unrelated parties. It has the highest name recognition and is the most widely used cryptocurrency. Bitcoin can't be printed more, and it can't be counterfeited. Bitcoin Blockchain is centered on identifying and verifying its rightful owners (Priyanka et al., 2023).
- Ether: shot up the cryptocurrency market capitalization rankings to number two very quickly. Ethereum is expected to become more popular than Bitcoin. The main focus of the Ethereum Blockchain is the running of applications or the Ethereum Network. The development of Ethereum makes it possible for thousands of programs to coexist on a single network (Sathyanarayana et al., 2020).
- Litecoin: It debuted in 2011 with the goal of becoming a silver product. Litecoin was developed in response to Bitcoin's shortcomings. Bitcoin's block production time is 10 minutes, but Litecoin's is just around 2.5 minutes. In addition, it can process more transactions per second. Double spending may be avoided because of the shorter block period (Priyanka et al., 2023).
- Monero: It adds privacy safeguards that were previously lacking in the Bitcoin system. The sender and receivers' identities are hidden via ring signatures. Covert addressing systems provide temporary numbers (Rahimi & Seyedin, 2019).
- Ripple: Something technological that can be used in several contexts. It uses open-source software and is completely decentralized. The XRP digital token from Ripple serves as a connecting mechanism. In a matter of seconds, a transaction may be finalized (Bhakuni & Ivanyan, 2023).