**FinSecure: A Proposal for a Regulated Intermediary and Integration of Blockchain Principle's**

Abstract:

This research paper examines the need for a fast, secure, and transparent payment system to accommodate the demands of modern-day living. The Unified Payments Interface (UPI) was introduced by the National Payments Corporation of India (NPCI) in April 2016, enabling seamless money transfers via the internet and smartphones. During the COVID-19 pandemic, UPI usage rose exponentially, facilitating a path towards a cashless economy in India. In October 2022, UPI had nearly 7.3 billion transactions. Despite its technological advancements, UPI has experienced some setbacks, including issues with intermediaries causing transactions to become stuck and fraudulent practices resulting from a lack of financial literacy among Indians. This paper proposes the introduction of a single intermediary regulated by the Reserve Bank of India (RBI) with additional security features and binding methods that provide a secure, reliable, transparent, and fast mechanism for transferring money. It also suggests holding money in the intermediary until certain conditions are met using smart contracts. Additionally, the paper discusses solutions to promote the use of central bank digital currency (CBDC) and a mechanism built on top of the proposed solution using blockchain technology to provide a tamper-proof ledger, transparent, secure, and efficient way to transfer funds among peers, international transfers, B2B, B2C, etc. The aim is to create a more efficient and secure payment system that can accommodate the needs of modern-day living.

1 Introduction:

As the world becomes increasingly digitalized, fast and secure payment systems are essential for day-to-day transactions. The introduction of the Unified Payments Interface (UPI) in India in April 2016 aimed to address these demands, enabling seamless transfer of funds through a smartphone with internet access. However, UPI faced several issues, including problems with intermediaries, causing transactions to become stuck and fraudulent practices resulting from a lack of financial literacy among Indians. In response to these challenges, this paper proposes a new payment solution that can overcome the issues faced by the current payment system in India while promoting the use of central bank digital currency (CBDC) and blockchain technology. The proposed payment solution suggests introducing a single intermediary regulated by the Reserve Bank of India (RBI) with additional security features and binding methods to provide a secure, reliable, transparent, and fast mechanism for transferring money. The paper aims to demonstrate how this payment solution can create a more efficient and trustworthy payment system in India. But the author would like to discuss some issues like,

1.1 The Challenges of UPI:

UPI is a popular payment system in India, with a massive surge in usage during the Covid-19 pandemic. In October 2022 alone, UPI had nearly 7.3 billion transactions. However, like every other technologically advanced system, UPI also had its flaws. One of the primary challenges of UPI is the involvement of too many intermediaries. This results in users experiencing issues where their money gets stuck in the transaction processing phase, debiting the user's account but providing no guarantee whether the amount would reach the receiver. For instance, a user may transfer Rs. 10,000 to their friend, and the money gets deducted from their account. However, due to a technical error or any other issue in the UPI system, the money may not reach the receiver, leaving the sender in a difficult position. Additionally, during transactions, a unique UPI ID of the receiver is required, which can be delinked from a user's account easily, posing a threat to fraudulent practices. For example, The current UPI system in India is susceptible to fraudulent practices where an individual could create an ID similar to that of another person, ask for payments from their peers, and then delink the ID further, leading to a potential fraud.

1.2 Central Bank Digital Currency (CBDC):

The modern world is moving towards digitalization, and cashless transactions are becoming increasingly common. In response to this, central bank digital currencies (CBDCs) were introduced as a new form of digital currency that can replace physical cash. CBDCs are issued and regulated by central banks, and they aim to facilitate faster and more secure transactions. However, central banks are cautious about implementing CBDCs due to concerns over privacy, cybersecurity, and the potential impact on financial stability. Some central banks have started experimenting with CBDCs, including the People's Bank of China and the European Central Bank. Still, the technology is relatively new, and there is much to learn before a full-scale implementation can be achieved.

1.3 Problems with the Current Payment System in India:

The current payment system in India faces several challenges that hinder its efficiency and trustworthiness. For instance, the involvement of too many intermediaries has led to issues of funds getting stuck in transaction processing phases. Additionally, the lack of financial literacy among Indians has resulted in fraudulent practices. Moreover, there is a need for a secure and reliable payment system that can accommodate the needs of modern-day living. In the absence of such a system, people have to rely on cash, which can be inconvenient and unsafe. Therefore, there is an urgent need for a more efficient and trustworthy payment system in India that can overcome these challenges.

1.4 Proposed Payment Solution:

To address the issues faced by the current payment system in India, this paper proposes a new payment solution that can accommodate the needs of modern-day living while promoting the use of CBDCs and blockchain technology. The proposed payment solution would involve the creation of a single intermediary regulated by the RBI, which would act as a central hub for all transactions. This intermediary would have additional security features and binding methods that would provide a secure, reliable, transparent, and fast mechanism to transfer money. To ensure the security and reliability of transactions, the intermediary would hold the funds until certain conditions are met using smart contracts. These conditions could include the successful completion of the transaction or the confirmation of receipt by the receiver. Once these conditions are met, the funds would be released to the receiver. The use of smart contracts would not only increase the security of transactions but also ensure that there is a level of trust between the payer and the receiver. This is particularly important in a country like India, where financial literacy is not widespread, and fraudulent practices are prevalent. To further enhance the security of transactions, the proposed payment solution would use blockchain technology. This would provide a tamper-proof ledger, a transparent, secure, and efficient way to transfer funds among peers, international transfers, B2B, B2C, etc. The use of blockchain technology would also reduce the need for intermediaries, leading to faster and more efficient transactions. The proposed payment solution would also address the problem of delinking UPI IDs from user accounts, which leads to fraudulent practices. Instead, the solution would use a unique identifier that is linked to the user's account and cannot be delinked without their permission. In summary, the proposed payment solution involves the creation of a single intermediary regulated by the RBI, with additional security features and binding methods that provide a secure, reliable, transparent, and fast mechanism to transfer money. The solution uses smart contracts and blockchain technology to ensure the security and reliability of transactions, while also reducing the need for intermediaries. By addressing the current problems of UPI, the proposed payment solution has the potential to revolutionize the payment system in India, making it more efficient and trustworthy.

In addition to the proposed solution, the author also discusses promoting the use of CBDC along with a mechanism built on top of the proposed solution using the recently trending blockchain technology. This would provide a tamper-proof ledger, a transparent, secure, and efficient way to transfer funds among peers, international transfers, B2B, B2C, etc.

The proposed solution, a single intermediary regulated by the RBI, would ensure a secure, reliable, transparent, and fast mechanism to transfer money. The solution would address the current problems of UPI, including the involvement of too many intermediaries, leading to the user's money getting stuck in transaction processing phase where the amount debits from the user's account but has no guarantee whether it would reach the receiver. Additionally, the minimum requirement of having a unique UPI ID of the receiver, which can be delinked from a user's account easily, leads to a large number of fraudulent practices, majorly due to the lack of financial literacy among Indians.

The proposed solution would involve holding money in the intermediary until certain conditions are met using smart contracts, ensuring that the funds are only released when the transaction is completed successfully. This would not only increase the security of transactions but also ensure that there is a level of trust between the payer and the receiver.

In conclusion, the paper proposes a solution to the current problems of UPI, which has paved the way towards a cashless economy in India but still faces issues that become a hindrance to a quick payment solution. The solution proposed involves a single intermediary regulated by the RBI with additional security features and binding methods that provide a secure, reliable, transparent, and fast mechanism to transfer money, with a focus on holding money in the intermediary until certain conditions are met using smart contracts. Additionally, the paper also proposes promoting the use of CBDC along with the proposed solution using the blockchain technology, which would provide a tamper-proof ledger, a transparent, secure, and efficient way to transfer funds among peers, international transfers, B2B, B2C, etc.

It is essential for the Indian government to take a closer look at the current payment system in India and take steps towards ensuring the security and reliability of transactions, thereby promoting a cashless economy. The proposed solution, if implemented correctly, has the potential to revolutionize the payment system in India, making it more efficient and trustworthy. With the growth of technology, it is essential for the Indian government to keep up and ensure that the payment system is up to date, secure, and reliable for the citizens of the country.

2 Related Work:

This section provides an overview of the existing literature on the Unified Payments Interface (UPI), central bank digital currencies (CBDCs), and improvements in UPI 2.0. The objective is to understand the potential of these technologies in modernizing payment systems and improving their efficiency and security.

2.1 Blockchain technology and its potential in payment systems

Blockchain technology is a decentralized, distributed ledger technology that offers several advantages in terms of transparency, security, and efficiency. It has gained significant attention in recent years due to its potential applications in various domains, including finance, healthcare, and supply chain management. In the proposed payment solution, blockchain technology is used to provide a tamper-proof ledger, a transparent, secure, and efficient way to transfer funds among peers, international transfers, B2B, B2C, etc. Several studies have explored the potential of blockchain technology in payment systems. Ahmed et al. (2020) proposed a blockchain-based payment system for microfinance institutions, which can reduce transaction costs and increase financial inclusion. Similarly, De Filippi and Loveluck (2016) discussed the potential of blockchain technology in creating decentralized payment systems that eliminate intermediaries and reduce transaction fees.

2.2 Central Bank Digital Currencies (CBDCs) and their potential in modernizing payment systems

Central bank digital currencies (CBDCs) are a form of digital currency issued and regulated by central banks. CBDCs aim to facilitate faster and more secure transactions, thereby reducing the dependence on physical cash. They have gained significant attention in recent years due to their potential to modernize payment systems. Several studies have explored the potential of CBDCs in modernizing payment systems. Engert et al. (2020) discussed the benefits and challenges of CBDCs and proposed a hybrid CBDC model that combines the advantages of both wholesale and retail CBDCs. Similarly, Bordo et al. (2021) discussed the implications of CBDCs on monetary policy and financial stability. They highlighted the need for a balanced approach in implementing CBDCs to avoid destabilizing the existing financial system.

2.3 Improvements in UPI 2.0 and their potential for financial inclusion

Since its introduction in 2016, the Unified Payments Interface (UPI) has undergone several upgrades to address the challenges faced by the current payment system in India. UPI 2.0, introduced in August 2018, introduced several new features, including overdraft facility, one-time mandate, and invoice in the inbox. Several studies have evaluated the impact of UPI on the Indian payment system and discussed its potential for financial inclusion. Chandrasekhar et al. (2020) analysed the impact of UPI on payment systems in India and found that UPI has led to a significant increase in digital payments. Similarly, Bahl et al. (2021) discussed the potential of UPI in promoting financial inclusion in India. They highlighted the need for continued innovation and improvements in UPI to address the challenges faced by the unbanked and underbanked populations in India.

2.4 Other Payment Systems:

Several other payment systems exist worldwide, including PayPal, Venmo, and Google Pay, to name a few. Each system has its strengths and weaknesses, and their adoption varies across countries. However, the proposed payment solution's use of CBDCs and blockchain technology makes it unique and potentially more efficient than other payment systems. Moreover, the proposed payment solution's focus on security and reliability is particularly relevant in a country like India, where trust in digital payment systems is still developing.

2.5 Security and Privacy Concerns:

The use of CBDCs and blockchain technology in the proposed payment solution raises several security and privacy concerns. These concerns include the risk of cyber-attacks, data breaches, and the potential misuse of personal data. However, the proposed payment solution addresses these concerns by introducing a single intermediary regulated by the RBI with additional security features and binding methods that provide a secure, reliable, transparent, and fast mechanism for transferring money. Additionally, the use of smart contracts and blockchain technology provides a tamper-proof ledger, increasing the security and transparency of transactions.

In summary, the literature suggests that blockchain technology and CBDCs have the potential to modernize payment systems, improve efficiency and security, and reduce the dependence on physical cash. Furthermore, the existing literature highlights the need for a reliable, secure, and efficient payment system in India, and the proposed payment solution aims to address these challenges while promoting the use of blockchain technology and CBDCs. The improvements in UPI 2.0 have shown promising results in increasing digital payments and promoting financial inclusion, and continued innovation in UPI is needed to address the challenges faced by the unbanked and underbanked populations in India.

3 Solution:

As the world is becoming more digitized, the use of electronic payment systems has become increasingly prevalent. In India, the current payment system involves a multi-stage transaction process, which can lead to delays and increased transaction times. The proposed solution aims to introduce a single intermediary to streamline the payment process and increase transaction efficiency.

Currently, when a user requests a transaction from a Payer Payment Service Provider (PSP), the request is forwarded to the National Payments Corporation of India (NPCI) server, where the amount is debited from the Remitter Bank. The request is then forwarded to the Payee PSP, where the account to which the amount is to be credited is resolved, and the NPCI servers update the beneficiary bank to credit the payee's account. The response is then traced back to the user upon successful transaction. As you can view it in Fig. 1 this multi-stage process can lead to delays and increased transaction times, as any unavailability of the intermediaries can cause delays in the transaction process.

To address this issue, the proposed solution suggests the use of a single intermediary to streamline the payment process. This intermediary would act as a middleman between the payer and payee, reducing the number of intermediaries involved in the transaction process. This would increase the transaction speed, as there would be fewer intermediaries involved in the process, reducing the chances of unavailability issues.

The proposed solution also aims to increase the trust, transparency, and security of electronic payments. By introducing a single intermediary, the transaction process becomes more transparent, as the intermediary would be responsible for verifying the transaction details and ensuring that the transaction is secure. This would increase the trust between the payer and payee, as the intermediary would act as a neutral party, ensuring that the transaction is conducted in a secure and reliable manner.

Moreover, by introducing a single intermediary, the proposed solution would help in creating a more efficient and reliable payment system. This would be beneficial for all stakeholders involved in the payment process, including consumers, merchants, and financial institutions. A more efficient payment system would enable faster transactions, reducing the transaction time and increasing the overall efficiency of the payment process.

To further enhance the security and reliability of the proposed solution, the use of smart contracts can be implemented. Smart contracts are self-executing contracts that use computer code to enforce the terms of the contract. This would eliminate the need for a third-party intermediary, as the smart contract would be responsible for verifying the transaction details and ensuring that the transaction is conducted in a secure and reliable manner.

In conclusion, the proposed solution aims to introduce a single intermediary to streamline the payment process and increase transaction efficiency. This would help in creating a more secure, efficient, reliable, and transparent payment system. Additionally, the implementation of smart contracts would further enhance the security and reliability of the payment system. By adopting these measures, the payment system in India can be made more efficient and reliable, benefiting all stakeholders involved in the payment process.

The use of blockchain technology can also be incorporated into FinSecure to increase security and safety in the transaction process. Blockchain technology offers decentralization, tamper-proof ledgers, and smart contracts as potential solutions for increasing security and safety.

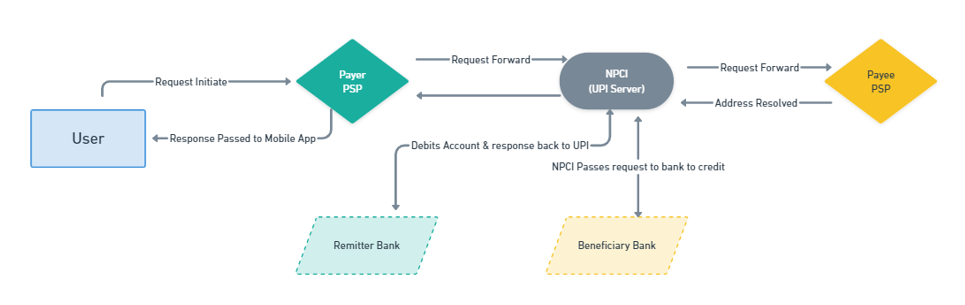


Fig. Current UPI Transaction Process

3.1 FinSecure

In today's digital world, the transaction process is evolving rapidly, and there is a need for a more efficient, secure, and reliable payment system. The current transaction process involves multiple intermediaries, which may lead to delays and increased transaction time. To address this issue, the proposed solution is to introduce a single intermediary that acts between Payer and Payee to increase transaction speed and efficiency.

FinSecure as an Independent Intermediary: FinSecure is an independent intermediary that aims to create a single intermediary that holds a central database for all known financial institutions to hold data for all user accounts. The primary objective of FinSecure is to maintain a double database to avoid confusion and provide a much-increased transaction speed. FinSecure is regulated by the Reserve Bank of India, which ensures the transparency and security of the payment system.

Central Database for Financial Institutions: The central database is the backbone of the proposed solution, which holds data for all user accounts. Each financial institution can update its own database over a regular interval to ensure accounts are debited and credited in a fast and efficient manner. The central database is accessible by all financial institutions, which eliminates the need for multiple intermediaries. The single intermediary approach proposed by FinSecure would also help in the reduction of costs associated with multiple intermediaries.

Blockchain Technology for Increased Security: The proposed solution also suggests using Blockchain technology to increase the security and safety of the database and transaction process. Blockchain technology is a decentralized and distributed ledger that maintains a secure and transparent record of all transactions. The use of Blockchain technology would enhance the security of the payment system, making it almost impossible to tamper with the data.

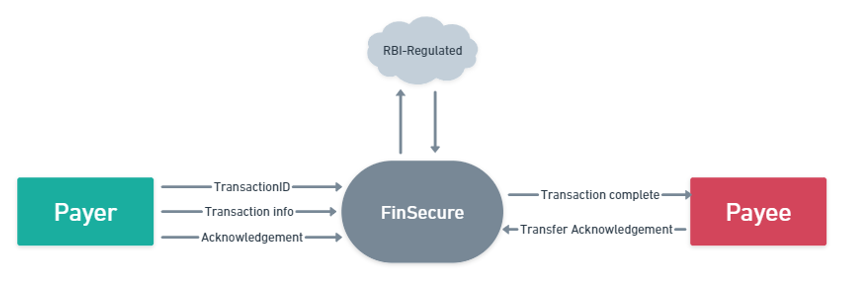


Fig. Context Diagram for FinSecure

3.1.1 Decentralization

Controlled decentralization is a solution for establishing a secure and reliable database, which minimizes the risk of data loss or discrepancies. By utilizing controlled decentralization, organizations can ensure that their data is protected from various unforeseeable calamities. Decentralization refers to the distribution of data and resources across multiple nodes or servers, instead of relying on a single centralized entity. This approach can significantly reduce the vulnerability of data to hacking, system failures, or natural disasters. Moreover, controlled decentralization also helps to maintain data privacy by enabling selective sharing of information and reducing the risk of unauthorized access. Implementing controlled decentralization requires careful planning and coordination to ensure that all nodes are synchronized and working in harmony. However, with the right tools and expertise, it can provide a highly effective means of securing data and minimizing risks.

The concept of controlled decentralization is an effective solution for establishing a secure and reliable database, which minimizes the risk of data loss or discrepancies. By utilizing controlled decentralization, organizations can ensure that their data is protected from various unforeseeable calamities. In simple terms, controlled decentralization refers to the distribution of data and resources across multiple nodes or servers, instead of relying on a single centralized entity. This approach can significantly reduce the vulnerability of data to hacking, system failures, or natural disasters. Moreover, controlled decentralization also helps to maintain data privacy by enabling selective sharing of information and reducing the risk of unauthorized access. This can be especially useful for organizations that handle sensitive and confidential data. Implementing controlled decentralization requires careful planning and coordination to ensure that all nodes are synchronized and working in harmony. However, with the right tools and expertise, it can provide a highly effective means of securing data and minimizing risks.

3.1.2 Tamper-Proof Ledger

A tamper-proof ledger is a distributed database that maintains a continuously growing list of records or transactions, which are cryptographically secured and verifiable, and provides a transparent and immutable record of all transactions that occur on the network, preventing any unauthorized modifications or tampering. Tamper-proof ledgers have gained significant attention in recent years due to their potential to revolutionize various industries, such as finance, healthcare, and supply chain management. Introducing an intermediary is one solution to maintain a tamper-proof ledger. The intermediary acts as a trusted third party that can authenticate the transaction and record it on the ledger, ensuring the integrity of the ledger while preserving privacy and confidentiality.

Blockchain technology, which powers tamper-proof ledgers, offers a decentralized and trustless environment that enables secure and efficient data sharing among multiple parties. The advantages of tamper-proof ledgers are numerous. They offer improved data security, increased transparency, reduced fraud, and streamlined processes, which can lead to cost savings and improved efficiency. Additionally, tamper-proof ledgers can facilitate new business models and revenue streams, such as peer-to-peer transactions, smart contracts, and tokenization.

In conclusion, tamper-proof ledgers provide a powerful solution for secure and efficient data sharing. The technology has the potential to transform the way businesses operate by increasing transparency, reducing fraud, and improving efficiency. With the help of intermediaries, tamper-proof ledgers can offer even greater benefits for businesses, especially in terms of ensuring data accuracy and minimizing risk. By leveraging the advantages of tamper-proof ledgers, businesses can create new opportunities for growth and innovation while enhancing the trust and confidence of their customers and partners.

3.1.3 Smart Contracts

Another important feature of FinSecure is the use of smart contracts to facilitate secure and automated transactions between payers and payees. Smart contracts are self-executing contracts with the terms of the agreement directly written into lines of code. They enable trustless and automated transactions between parties, eliminating the need for intermediaries and reducing the risk of fraud.

By introducing smart contracts in FinSecure, the platform can ensure that funds are only released when specific conditions are met, providing an added layer of security and trust in the payment process. For instance, in a real estate transaction, the smart contract can hold the funds until the buyer receives the title deed and the seller receives the payment. The smart contract can also enforce specific conditions, such as the delivery of goods or completion of a service, before releasing the payment.

Smart contracts can be programmed to execute automatically once the conditions are met, without the need for any manual intervention. This feature can significantly reduce the time and cost associated with traditional payment systems, which often require multiple intermediaries and manual processing.

Smart contracts have the potential to revolutionize various industries, including finance, real estate, and supply chain management. They can enable new business models and revenue streams, such as peer-to-peer lending, crowdfunding, and tokenization. Moreover, smart contracts can enhance transparency, reduce fraud, and improve efficiency, leading to cost savings and increased trust in the payment process.

In conclusion, FinSecure's use of smart contracts provides a secure and efficient means of conducting transactions between payers and payees. The use of this technology can enhance transparency, reduce the risk of fraud, and improve efficiency in payment systems.

FinSecure is an independent intermediary that facilitates transactions between payers and payees. It is regulated by the Reserve Bank of India and operates with the aim of creating a secure and efficient transaction process. FinSecure operates with two major duties, registration and transaction, which we will discuss in detail in the following sections.

3.2 Registration Process

The registration process is the first step in using FinSecure's services. It involves the input of account details, such as personal information, banking details, and other relevant data. The data is then stored in a decentralized database that maintains a continuously growing list of records or transactions.

As you can view in Fig. 3 upon arrival of the data, the Value-Binder function runs and creates a unique Binding-Value for each account. Each user account is associated with a different value, much like how each transaction on a ledger or a block in a blockchain has a unique id, even if the user is the same. The binding value is generated using a cryptographic algorithm, which ensures that it is unique and tamper-proof.

Once the binding value is generated, it is mapped with the account details, and the database is updated. The mapping of binding values to account details helps in the retrieval of account information in the database. It also helps to maintain the integrity of the database as the binding value acts as a unique identifier for each account.

The decentralized database used in FinSecure is a key feature of the system. Decentralized databases are gaining attention in recent years because they offer better scalability, fault tolerance, and resilience to attacks. These databases are distributed across multiple nodes, making them less vulnerable to single-point failures or cyberattacks.

In a decentralized database, there is no central authority that controls the data, making it more transparent and less susceptible to fraud. Transactions are validated by the network, and consensus is achieved through a distributed consensus algorithm. Blockchain technology, which powers FinSecure, is an example of a decentralized database that offers a transparent and immutable record of all transactions that occur on the network.

In conclusion, the registration process of FinSecure is a critical step in ensuring the security and efficiency of digital transactions. The process involves the input of account details, the generation of unique binding values, and the storage of account information in a decentralized database. Decentralized databases are gaining attention in recent years because they offer better scalability, fault tolerance, and resilience to attacks. Blockchain technology, which powers FinSecure, is an example of a decentralized database that offers a transparent and immutable record of all transactions that occur on the network.

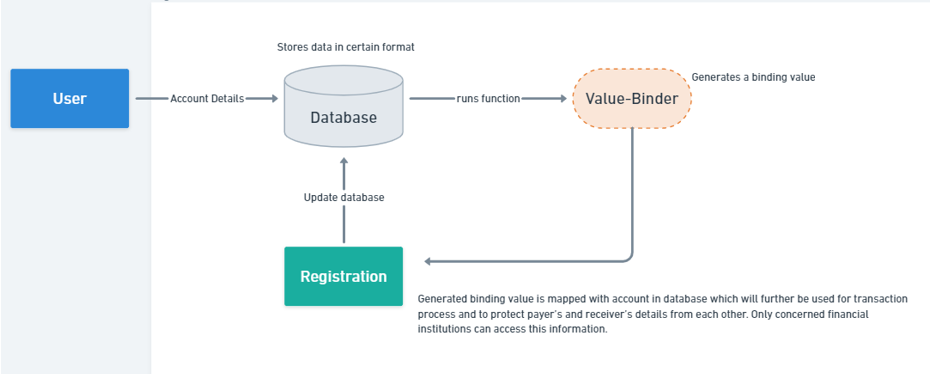


Fig. Registration Process of FinSecure

3.3 Transaction Process

In Fig. 4, the transaction process begins when a registered user initiates a transaction. The user sends transaction details, such as the transaction amount, address, and id, to the payer. The transaction information then arrives at the intermediary, which is responsible for verifying that the transaction's conditions have been met. This verification process involves checking the smart contract details associated with the transaction, which specify the conditions that must be met for the transaction to be considered complete.

Smart contracts are self-executing programs that run on a blockchain network and can be used to automate various tasks, including financial transactions. They are a key component of blockchain-based systems, as they enable transactions to be executed automatically when certain conditions are met, without the need for intermediaries or third-party validators. Smart contracts are often used in decentralized finance (DeFi) applications, which are financial services that operate on blockchain networks and are designed to be open, transparent, and accessible to anyone with an internet connection.

In the context of FinSecure, smart contracts are used to ensure that transactions are executed according to the agreed-upon terms and conditions. When a user initiates a transaction, the intermediary checks the smart contract associated with that transaction to determine whether the conditions for executing the transaction have been met. If the conditions have been met, the funds are transferred from the payer to the payee. If the conditions have not been met, the transaction is cancelled, and the funds are returned to the payer.

The use of smart contracts in financial transactions has several benefits. First, it eliminates the need for intermediaries, such as banks or other financial institutions, which can reduce transaction costs and increase efficiency. Second, it enables transactions to be executed automatically and securely, without the need for human intervention. This reduces the risk of fraud and errors, and increases the transparency and accountability of the transaction process. Finally, smart contracts can be used to create complex financial instruments, such as derivatives, that are difficult or impossible to create using traditional financial systems.

However, the use of smart contracts in financial transactions also presents several challenges. One of the biggest challenges is the lack of legal clarity around smart contracts. Because smart contracts are self-executing and operate on a blockchain network, it can be difficult to determine which legal jurisdiction they fall under and which laws apply to them. This can create uncertainty for users and may limit the adoption of smart contracts in certain industries.

Another challenge is the potential for bugs or vulnerabilities in smart contract code. Smart contracts are written in programming languages and are subject to the same types of errors and vulnerabilities as other software. If a smart contract contains a bug or vulnerability, it can be exploited by malicious actors, leading to loss of funds or other negative outcomes. Therefore, it is important to thoroughly test smart contracts and to have mechanisms in place for detecting and mitigating security risks.

In conclusion, the use of smart contracts in financial transactions has the potential to revolutionize the way we conduct financial transactions. By enabling transactions to be executed automatically and securely, without the need for intermediaries, smart contracts can reduce transaction costs, increase efficiency, and increase transparency and accountability. However, the use of smart contracts also presents several challenges, including legal uncertainty and security risks. Therefore, it is important to carefully consider the benefits and risks of using smart contracts and to take steps to mitigate potential risks.

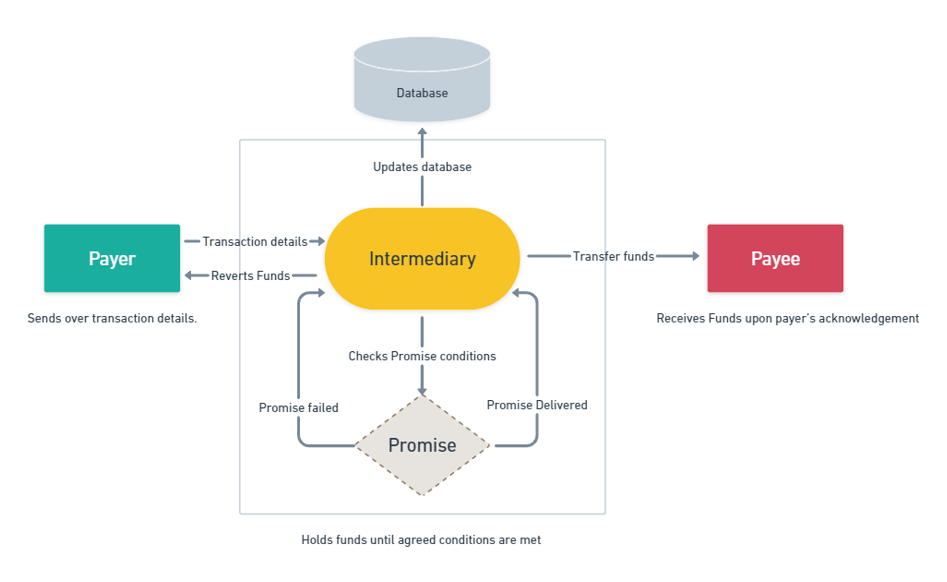


Fig. New Payment System with FinSecure

In conclusion, FinSecure offers a secure and efficient transaction process by using a tamper-proof ledger that maintains a transparent and immutable record of all transactions. The registration process involves generating unique identifiers for accounts, which are mapped to a decentralized database. The transaction process involves the use of smart contracts to ensure that the promise is fulfilled before transferring funds to the payee. The use of blockchain technology in FinSecure's operations ensures increased security, transparency, and efficiency. The potential of blockchain technology in transforming the financial industry has been widely recognized, and research in this area is ongoing. For example, research has shown that blockchain technology can be used to improve cross-border payments, reduce transaction costs, and increase financial inclusion. The adoption of blockchain technology in financial systems is expected to continue to grow in the coming years.

4 Results:

The implementation of a blockchain-based intermediary system in financial transactions has the potential to revolutionize the way business is conducted. This is because the technology underlying blockchain provides unparalleled security and transparency in transactions, as each transaction is recorded and verified by multiple nodes in a decentralized network. By introducing such a system, the trust between small time manufacturers and customers can be increased, as it becomes more difficult for dishonest actors to cheat the system.

One of the main benefits of using blockchain technology is the increased transparency it provides in transactions. Each transaction is recorded on a decentralized ledger, which means that it is viewable by anyone on the network. This level of transparency allows for greater accountability in financial transactions, as it becomes more difficult for individuals or businesses to engage in fraudulent behaviour. The use of blockchain technology can also increase the reliability of transactions, as it creates an immutable record of all transactions that cannot be tampered with.

Moreover, by implementing a blockchain-based intermediary system, businesses can build a more transparent and better solution for customers. This can lead to increased sales, as customers are more likely to trust and do business with companies that use transparent and secure payment systems. It also benefits businesses by reducing the cost of traditional payment processing, as the decentralized nature of blockchain technology reduces the need for intermediaries and third-party payment processors.

For example, in 2021, Walmart Canada announced that it would be implementing a blockchain-based payment system for its supply chain. This system, called the Walmart Canada Blockchain, is designed to increase transparency and traceability in the supply chain by tracking product information, such as origin, batch numbers, and shipping details. This system is expected to increase the efficiency and transparency of the supply chain, while also reducing costs and improving customer trust.

Additionally, introducing an intermediary system that stands on the principles of blockchain can be a potential new solution to add to the existing secure payments system. This can lead to increased adoption of blockchain technology, as businesses and customers become more familiar with its benefits. By creating a secure and transparent payment system that can be easily integrated into existing financial systems, businesses can improve their overall financial infrastructure and make it easier for customers to transact with them.

Lastly, the implementation of a blockchain-based intermediary system can also promote the adoption of central bank digital currency (CBDC) based payment systems. CBDCs are digital currencies issued by central banks, which operate on a blockchain or distributed ledger technology. The implementation of a blockchain-based intermediary system can be easily built on top of CBDCs by having some technological changes that can benefit a lot to RBI and India culture. By providing a secure and transparent payment system, CBDCs can potentially reduce the costs and improve the efficiency of financial transactions, while also promoting financial inclusion for the unbanked and underbanked populations.

In conclusion, the implementation of a blockchain-based intermediary system can increase transparency, reliability, and security of financial transactions. It can improve the trust between small time manufacturers and customers, increase sales, and reduce the costs of traditional payment processing. Moreover, it can promote the adoption of CBDC-based payment systems, leading to greater financial inclusion and economic growth.

5 Future Scope:

Finsecure has the potential for several future research and development applications. One such application is the introduction of a Central Bank Digital Currency (CBDC) based payment system over the existing system. CBDC is a digital currency issued by the central bank, which can be used for transactions, just like physical cash. The introduction of a CBDC-based payment system can offer several advantages, including lower transaction costs, increased security, and faster transaction processing times. Moreover, CBDC can help eliminate the need for intermediaries in payment transactions, thus reducing the costs associated with payment processing.

Another future scope for Finsecure is linking of UPI ID with Binding Value to result in a more secure environment to protect user data and address different issues presented in the UPI system. For example, Finsecure can help address the issue of de-linking of impersonated UPI IDs that can lead to fraud. With the help of Finsecure's unique Binding Value, each account can be linked to a unique identifier that can help prevent fraud and unauthorized access to user data.

Furthermore, Finsecure can help provide a more efficient and secure payment system that can benefit not only individuals but also businesses. With the help of Finsecure, businesses can conduct transactions with increased transparency, reliability, and security. This can help reduce the risk of fraud, increase trust between parties, and promote a more seamless and efficient payment system.

Overall, the future scope of Finsecure is vast and has the potential to revolutionize the way payments are conducted in India. By introducing CBDC-based payment systems and linking UPI IDs with Binding Value, Finsecure can provide a more secure, efficient, and reliable payment system that can benefit individuals, businesses, and the Indian economy as a whole.

Additional to the above benefits incremental research on FInsecure can be on topics like:

1. Integration with DeFi: Decentralized finance (DeFi) protocols can offer various financial services, including lending, borrowing, and trading. By integrating with DeFi, Finsecure can enhance its capabilities and offer these services to its users. This can increase the efficiency of financial transactions and provide users with more options.
2. Cross-border payments: Finsecure can expand its services to support cross-border payments, which can enable users to send and receive payments globally. This can promote international trade and commerce, making it easier for businesses and individuals to transact with each other across borders.
3. Integration with IoT: The integration of Finsecure with the Internet of Things (IoT) can facilitate secure and automated payments for various IoT devices. This can promote the growth of smart cities and homes by enabling users to make payments for various IoT services automatically, without the need for manual intervention.
4. Digital identity verification: Finsecure can leverage blockchain technology to develop a digital identity verification system. This can enhance the security of transactions and reduce fraud by providing a tamper-proof record of users' identities.
5. Supply chain management: Finsecure can offer supply chain management solutions, which can enhance the transparency and efficiency of supply chain operations. This can enable businesses to track the movement of goods and make payments for them automatically, reducing the risk of fraud and errors.
6. Micropayments: Finsecure can develop micropayment solutions, which can enable users to transact small amounts of money efficiently. This can promote financial inclusion by making it easier for users to access financial services and make small transactions.
7. Smart contracts: The use of smart contracts can enable Finsecure to automate various business processes, including payments. This can reduce costs and enhance efficiency by eliminating the need for manual intervention in these processes.
8. Integration with AI: The integration of Finsecure with Artificial Intelligence (AI) can facilitate intelligent decision-making, fraud detection, and risk management. This can enhance the security of financial transactions and provide users with more accurate and personalized financial services.
9. E-commerce solutions: Finsecure can offer e-commerce solutions, which can enable secure and fast transactions for online shoppers. This can provide users with a seamless shopping experience by integrating with popular e-commerce platforms.
10. Mobile payments: Finsecure can develop mobile payment solutions, which can enable users to make payments using their smartphones. This can promote convenience and ease of use by eliminating the need for physical cash or cards.

6 Conclusion:

In conclusion, this research paper has highlighted the challenges faced by the current payment system in India, specifically the issues related to intermediaries causing transaction delays and fraud resulting from a lack of financial literacy among Indians. To address these issues, the paper has proposed the introduction of a single intermediary regulated by the Reserve Bank of India (RBI) with additional security features and binding methods to provide a secure, reliable, transparent, and fast mechanism for transferring money.

Moreover, the paper has discussed solutions to promote the use of central bank digital currency (CBDC) and the implementation of blockchain technology to provide a tamper-proof ledger, transparent, secure, and efficient way to transfer funds among peers, international transfers, B2B, B2C, etc. The proposed payment solution has the potential to revolutionize the payment industry in India by providing a secure and efficient payment system while promoting the adoption of CBDC and blockchain technology.

Overall, the proposed payment solution has the potential to overcome the challenges faced by the current payment system in India while promoting financial inclusion, increasing financial literacy, and strengthening the Indian economy. The successful implementation of this payment solution can provide a template for other countries to improve their payment systems and promote the adoption of CBDC and blockchain technology. It is important for the Reserve Bank of India to carefully consider the proposed payment solution and work towards implementing it to improve the payment system in India.

7 References: