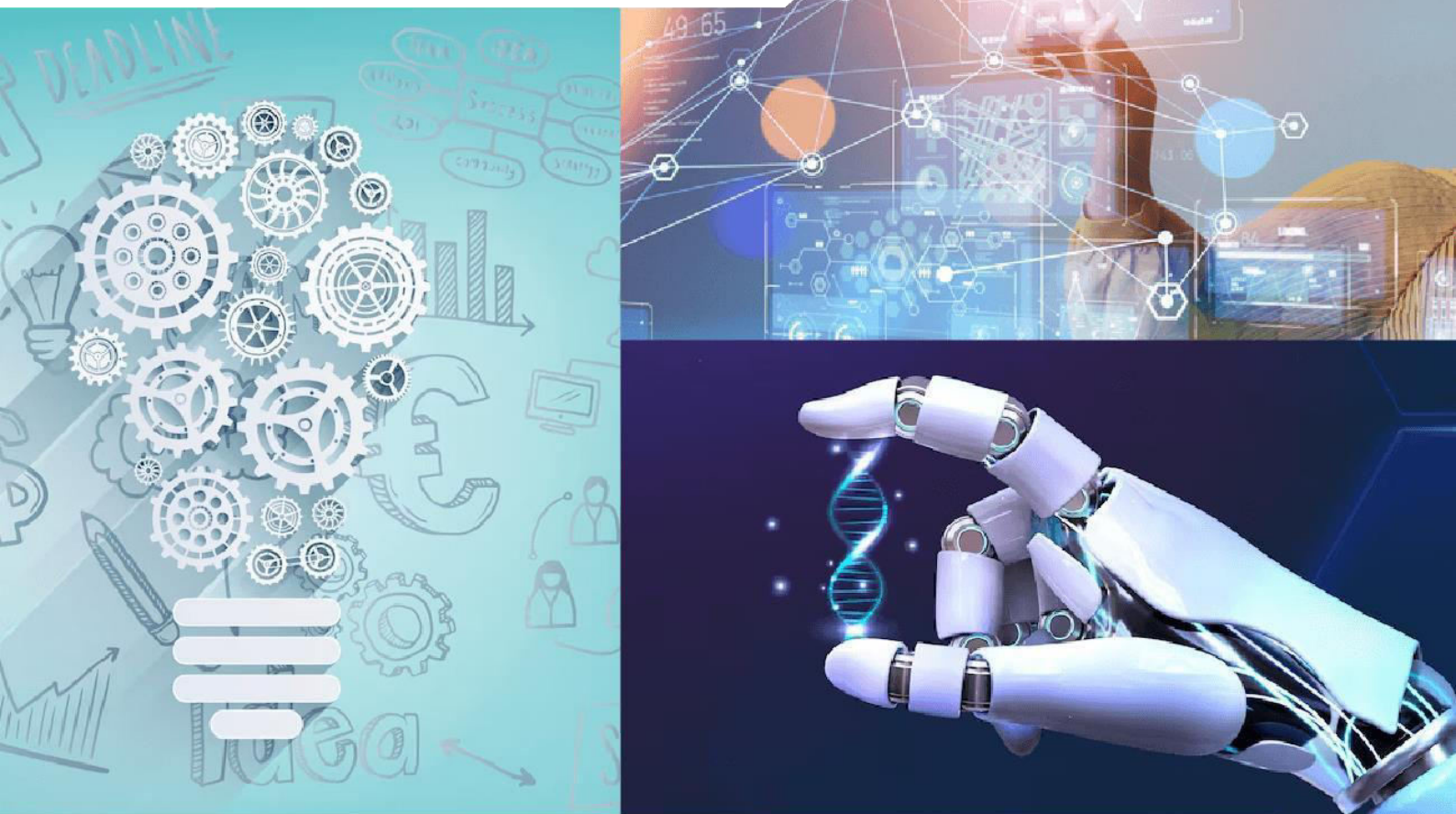




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A Blockchain-Powered KYC: Transforming Credit Risk Assessment in Modern Banking

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ABSTRACT: The implementation of Know Your Customer (KYC) strategies in the financial sector enhances operational efficiency and mitigates risks associated with fraudulent activities, money laundering, and other financial crimes. While most financial institutions follow independent KYC procedures, a centralized or blockchain-based system offers a more transparent and efficient alternative. Blockchain technology, with its decentralized, immutable, and cryptographic features, ensures real-time validation and security of customer data, reducing the risk of breaches. Additionally, it streamlines the client experience by eliminating redundant paperwork. This study proposes a blockchain-based KYC framework built on Ethereum, enabling financial institutions to read and write financial data securely. The system ensures transparency and efficiency while addressing critical security concerns, such as Sybil attacks. Furthermore, it enhances financial security by implementing KYC validation for high-value transactions using KYC ID proof. Banks will generate account numbers and IFSC codes while validating users at every transaction, ensuring authenticity. Customers will have access to a real-time ledger of their transactions, while banks maintain centralized control to enforce compliance and mitigate risks.

KEY WORDS: KYC(Know Your Customer),DB(DataBase),JVM(Java Virtual Machine),JSP(Java Server Page),CB (Collective Behaviour),RSSS(Ramp secret sharing scheme),JRE(Java Runtime Environment).

I.INTRODUCTION

The objective of implementing a blockchain-based Know Your Customer (KYC) system is to enhance the efficiency, security, and transparency of customer verification processes in the financial sector. By leveraging blockchain technology, the system aims to streamline and centralize KYC procedures, reducing redundant paperwork and minimizing the risk of data breaches through immutable and cryptographically secure records. This approach facilitates real-time validation and verification of customer data for all relevant stakeholders, thereby accelerating onboarding processes and improving overall operational efficiency. Additionally, the system seeks to address critical challenges, such as Sybil attacks, by employing advanced security measures and consensus mechanisms to ensure the integrity and reliability of the data. Ultimately, the goal is to establish a dynamic, transparent, and robust KYC framework that fosters collaboration among financial institutions while safeguarding client information.

II. LITERATURE SURVEY

Title: A review of blockchain approaches for KYC.**Year:** 2023

Author: N. Mansoor, K. F. Antora, P. Deb, T. A. Arman, A. A. Manaf, and M. Zareei

Description: The KYC procedure is one of the most important documents on a bank's checklist, and it is also one of the most expensive and inefficient. Thus, embracing new technologies is vital for the future of banking firms. Blockchain is one of the most popular technologies today because of its reliability and security in multiple fields. This research seeks to find out how the application of Blockchain technology can transform the banking business, especially the verification of KYC documents through storing and monitoring of information. There is a dire need for an optimized KYC system today, one that would ensure security and privacy while overcoming fraud, scalability, and privacy challenges—especially when fortified by Blockchain technology. The article evaluates heretofore relevant works describing how the use of Blockchain technology does not require intermediaries, thus eliminating the possibility of malicious and incorrect actions from the many manual processes.

Title: Bank records storage system through blockchain.**Year:** 2023

Author: R. Rohitchandran, B. Santhoshkumar, and M. Kumar

Description: This research puts forth a system that utilizes the integration of blockchain, a database for storage, and cryptography to preserve the confidentiality and security of bank records. With the application of blockchain technology, storage of data is safeguarded while its integrity is ensured, at the same time smart contracts monitor the precise control of data access and its distribution. To further secure the data, the off-chain records are frequently connected with the hash information on the blockchain. With the employment of cryptography, documents and messages can be encrypted and digitally signed. The system contains a WebApp interface which allows all participants in the transaction to interact in a distributed manner.

Title: Sybil in the haystack: A comprehensive review of blockchain consensus mechanisms in search of strong Sybil attack resistance**Year:** 2023 **Author:** M. Platt and P. McBurney.

Description: In order to strengthen fault tolerance of distributed computer systems, consensus algorithms are implemented. The issuance of "Bitcoin" prompted a surge of interest in research pertaining to the subsequent development of the technology's distributed ledger. In public and permissionless networks, there exist sophisticated leader selection algorithms that are protected from Sybil attacks where a malicious user has prompts multiple fake personas to create byzantine faults. Our objective is to map the entire extent of existing literature with the aim of identifying gaps and defining focus points pertaining to defense against Sybil attacks in contemporary blockchain systems which would inform designs for the systems of the future. The literature review allows us to sift through a vast dataset of research records (N = 21,799) to focus on more relevant studies (N = 483). These mechanisms are categorized based on their attributes pertaining to resistance against Sybil attacks, leader selection strategies, as well as their reward system. Theories that are most resistant to Sybil attacks generally tend to follow 'proof of work' or 'proof of stake' ideology while those that are less resistant rely on some form of reputation or real world linking systems. While we show that there are very few dominant theories capable of defending against Sybil attacks within a permissive framework, we show that there are many new theories that can circumvent such conditions.

Title: Exploring the determinants of blockchain acceptance for research data management.**Year:** 2023

Author: C. Woo and J. Yoo.

Description: Researchers are highly interested in research data management to derive excellent research results. A research model was established based on the technology acceptance model. A total of 585 researchers from numerous universities and research institutes in Korea contributed to the sample. The primary research findings indicated that the usefulness and ease of use lowered the perceived risks and enhanced the intention to use. Social norms also decreased perceived risk factors and increased intention to use. The implications of this research is that, when developing services based on blockchain technology, managers should find methods to mitigate the technical risks posed by blockchain. Moreover, they must grant users to easily use blockchain-based services and recommend them to other users around them.

Title: Bitcoin: A Peer-to-Peer Electronic Cash System.**Year:** 2023

Author: S. Nakamoto.

Description: Transactions such as sending cash can now be done without routing through a central financial authority, however, it still requires trust to prevent double-spending. Allowing people to transact solely between individuals without a third party is called peer-to-peer cash system which is aided with digital signatures. In an attempt to allow free transferring of money, we provide a solution with a peer-to-peer network which completely protects against double spending policies. This is Einstein's theory: proof of work. It is a network that captures information by hashing them repetitively forming a chain every time the proof of work gets done. Normally there is risk of change after completing proof of work but the structure makes it so there is no risk of change after completing proof of work. Not only does the longest hash serve as the proof of working CPU, but it gives a path to complete the event diagnosis CPU streamlined process. The core backbone structure of the network is simple. As logic suggests, messages will only be sent if it's easy. Arresting the flow of messages enables nodes to freely connect and disconnect whenever except during the submission of the longest proof of work claim.

Title: A review on blockchain applications in fintech ecosystem.**Year:** 2022

Author: B. Karadag, A. Akbulut, and A. H. Zaim.

Description: The term fintech started to become popular from the 90s. With the rapid development of technology and the widespread use of the internet, Fintech has become a sector in itself, especially since 2004. The Fintech sector has seen significant progress across various areas, including ATMs, credit and debit cards, mobile payments, internet banking, and the broader infrastructure and operations of digital banking. "Blockchain's decentralized nature, enabled

by its distributed ledger system, allowed Bitcoin transactions to occur without the need for intermediaries. Following Bitcoin, the development of various crypto assets began to emerge like Ethereum opened the way for these transactions to be programmable as an infrastructure. Programmable blockchain platforms are now being utilized beyond financial services, extending their applications to industries like healthcare, supply chain management, education, and insurance. There are different academic studies on applications related to these sectors. However, there is no such a review that includes them all together for finance. In addition, possible future blockchain applications were also mentioned.

III. EXISTING SYSTEM

- It was easier for individuals and organizations to use financial institutions to launder money. They could move illicit funds through the financial system without being properly identified.
- Financial institutions had a harder time detecting and preventing fraudulent activities. The lack of customer verification made it easier for fraudsters to open accounts and carry out fraudulent transactions.
- Financial institutions were exposed to higher financial risks due to the inability to properly vet customers. This could lead to higher default rates, financial losses, and increased operational costs associated with managing these risks.

EXISTING SYSTEM DISADVANTAGES

- It can distort financial markets by inflating asset prices and creating artificial economic conditions.
- When money laundering is prevalent, people may lose confidence in the fairness and transparency of the financial system.
- Financial institutions face higher compliance costs as they invest in systems and processes to detect and prevent money laundering.

IV. PROPOSED SYSTEM

- KYC helps in identifying and preventing fraudulent activities. By knowing who their customers are, banks can better detect suspicious transactions and patterns that may indicate fraud.
- Many countries have laws and regulations requiring financial institutions to implement KYC procedures. Compliance with these regulations helps banks avoid legal penalties and ensures that they are operating within the law.
- All actions related to KYC data are recorded on the blockchain, enhancing transparency and accountability.

PROPOSED SYSTEM ADVANTAGES

KYC helps prevent identity theft and fraud by ensuring that financial institutions accurately verify the identities of their clients.

By implementing robust KYC processes, institutions can detect and prevent activities such as money laundering, terrorist financing, and other illicit financial activities, contributing to a more secure and transparent financial system.

V. SYSTEM ARCHITECTURE

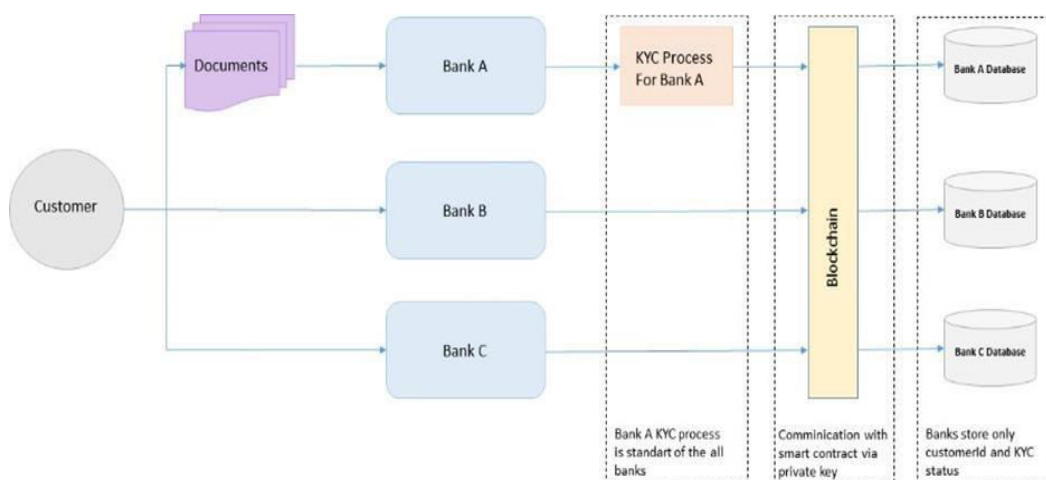


Fig:1 System Architecture

KYC practices encompass the customer identification and due diligence procedures employed by financial institutions. These procedures aim to establish a comprehensive understanding of the customer's identity, risk profile, and financial activities. By gathering and analyzing this information, institutions can effectively mitigate potential risks associated with money laundering, terrorist financing, and other financial crimes. Furthermore, a robust KYC process allows for tailored service configurations that best suit the customer's needs. Blockchain offers several advantages for establishing an integrated platform for secure KYC data storage. The application of blockchain technology presents a compelling opportunity for the secure and transparent storage and exchange of credit allocation data within the financial sector. This distributed ledger system fosters trust and transparency amongst all stakeholders involved in the credit allocation process, including banks, borrowers, and other relevant parties. Furthermore, blockchain technology can significantly enhance the efficiency of credit allocation procedures. By leveraging this technology for credit allocation data, banks can streamline the verification and validation of borrower information, resulting in a reduction in both the time and costs associated with traditional, manual processes.

VI. METHODOLOGIES

Modules Name:

- User Interface Design
- Admin
- Bank
- Customer
- KYC
- All Transactions

1.User Interface Design:

To connect with server user must give their username and password then only they can able to connect the server. If the user already exists directly can login into the server else user must register their details such as username, password, Email id, City and Country into the server. Database will create the account for the entire user to maintain upload and download rate. Name will be set as user id. Logging in is usually used to enter a specific page. It will search the query and display the query.

2.Admin:

This is the third module in our project is Admin. Here admin will login with his password and Id who has created by the bc operator. After admin login directly will navigate into admin home page. The purpose of an administrator is to oversee and manage the operations and functionality of an organization, system, or project. Administrators are responsible for coordinating tasks, enforcing policies, and ensuring that processes run smoothly and efficiently.

3.Bank:

Banks play a vital role in the financial system by providing essential services that facilitate economic activity and personal financial management. They offer a secure place for individuals and businesses to deposit and manage their money, ensuring the safekeeping of funds against theft or loss.

4.Customer:

This is the fourth module in our project is Customer. Customers must provide accurate, complete, and up-to-date personal information, address, as requested by the bank. They are also required to submit the necessary documentation promptly and update their details if there are any changes, such as a new address or a name change. Customer bank transactions encompass a range of financial activities performed by account holders through their banking institution. These transactions include deposits, where customers add funds to their accounts; withdrawals, where they remove money; transfers, where they move funds between accounts or to other individuals or institutions. Each transaction is recorded and monitored by the bank to ensure accuracy and to maintain a comprehensive account history.

5.KYC:

Know Your Customer (KYC) is a crucial process employed by financial institutions to verify the identity of their clients and assess potential risks of illegal activities, such as money laundering or fraud. Through KYC procedures, banks and other financial entities collect and analyze personal information from customers, including identity documents, proof of address, and financial history.

6.Transactions:

This is the Fifth module in our project is Transactions. Credit and deposit transactions are fundamental activities in banking where customers interact with their accounts. A credit occurs when funds are added to a customer's account, such as through a paycheck deposit, loan disbursement, or a transfer from another account. Deposits, on the other hand, involve customers placing money into their accounts, which can be done through various methods including cash deposits, checks, or electronic transfers. Banks record these transactions meticulously to ensure account balances are accurately updated and to provide customers with a clear and detailed account of their financial activity.

VII. ALGORITHM USED

EXISTING TECHNIQUE: - MONEY LAUNDERING:

- It was easier for individuals and organizations to use financial institutions to launder money. They could move illicit funds through the financial system without being properly identified.
- Financial institutions had a harder time detecting and preventing fraudulent activities. The lack of customer verification made it easier for fraudsters to open accounts and carry out fraudulent transactions.
- Financial institutions were exposed to higher financial risks due to the inability to properly vet customers. This could lead to higher default rates, financial losses, and increased operational costs associated with managing these risks.

PROPOSED TECHNIQUE USED: - KNOW YOUR CUSTOMER:

KYC, or Know Your Customer (KYC) is a procedure implemented by financial institutions to verify the identity of their clients and

other regulated entities to verify the identity of their clients and assess potential risks of illegal activities such as money laundering or fraud. Entails gathering and confirming individuals' personal information. information such as name, address, and identification documents. KYC was introduced to enhance security and ensure compliance with legal and regulatory requirements. By establishing the true identity of clients, institutions can prevent criminal activities, protect themselves from financial crimes, and maintain the integrity of the financial system. This process helps in building trust and safeguarding both the institutions and their customers. A Blockchain is a revolutionary technology that provides a decentralized and immutable digital ledger for recording transactions across a distributed network of computers. Unlike traditional centralized databases, where a single entity controls the data, blockchain operates through a network of nodes, each maintaining a copy of the entire ledger. This structure ensures that once a transaction is recorded, it cannot be altered or tampered with, enhancing data integrity and security. Initially popularized by cryptocurrencies like Bitcoin, blockchain technology is now being explored and implemented in various sectors, including finance, supply chain management, healthcare, and more, due to its potential to streamline processes, enhance security, and enable new forms of collaboration.

VIII. EXPERIMENTAL RESULTS

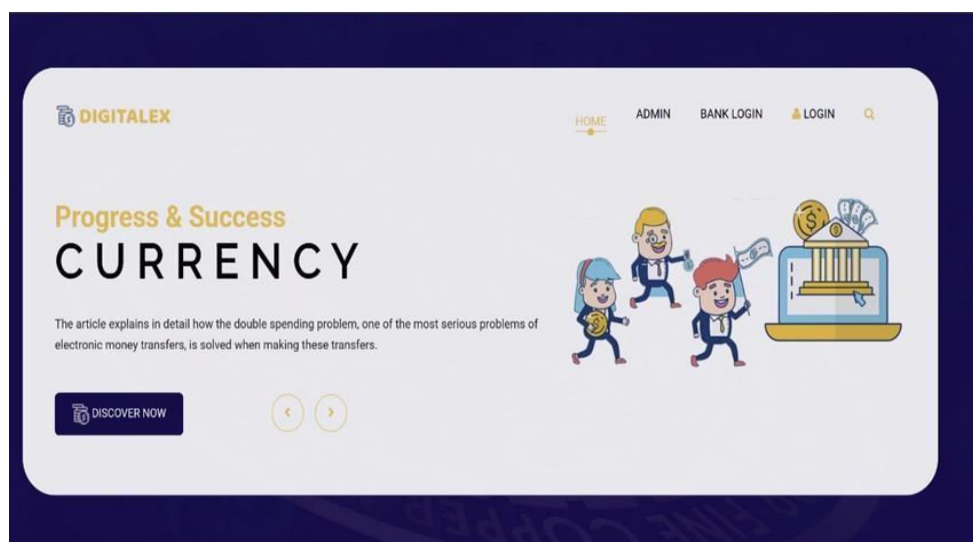


FIGURE:2 HOME PAGE

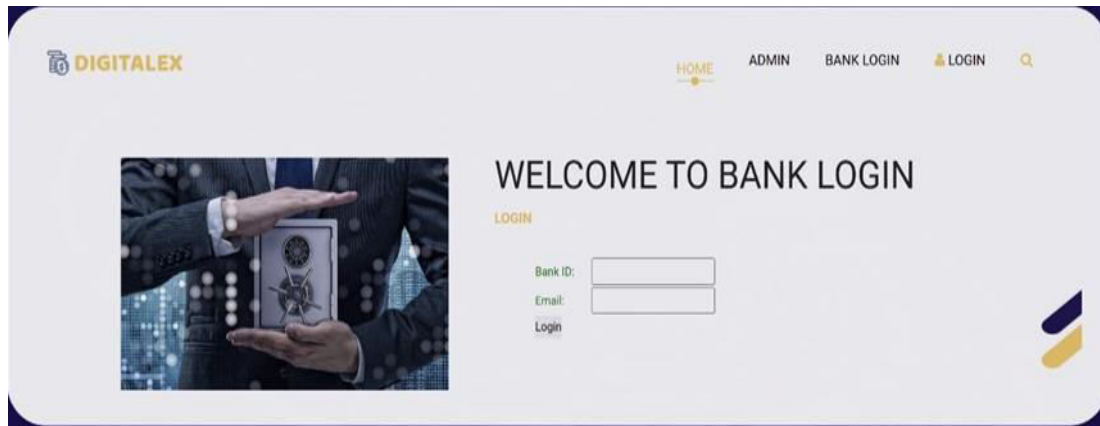


FIGURE:3 BANK LOGIN PAGE

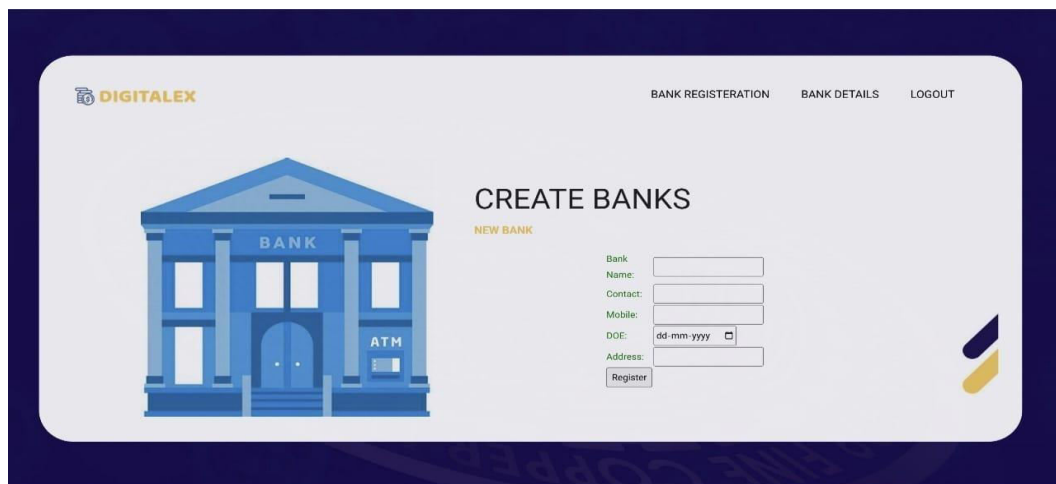
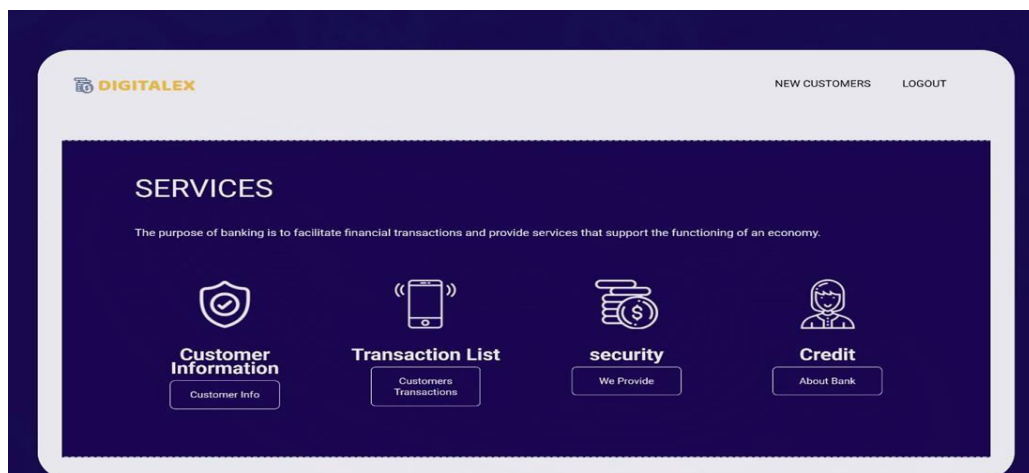


FIGURE:4 CREATE BANKS



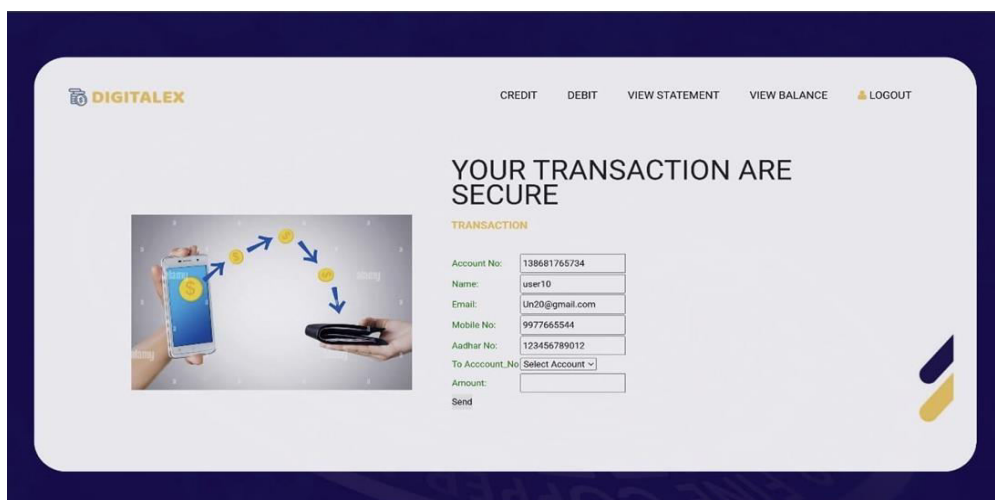


FIGURE:6 TRANSACTIONS

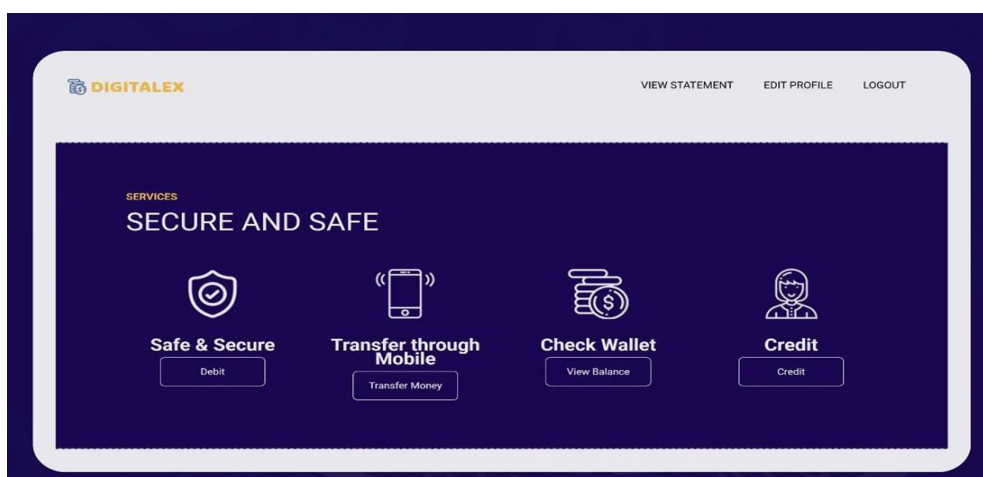


FIGURE 7: CUSTOMER SERVICES

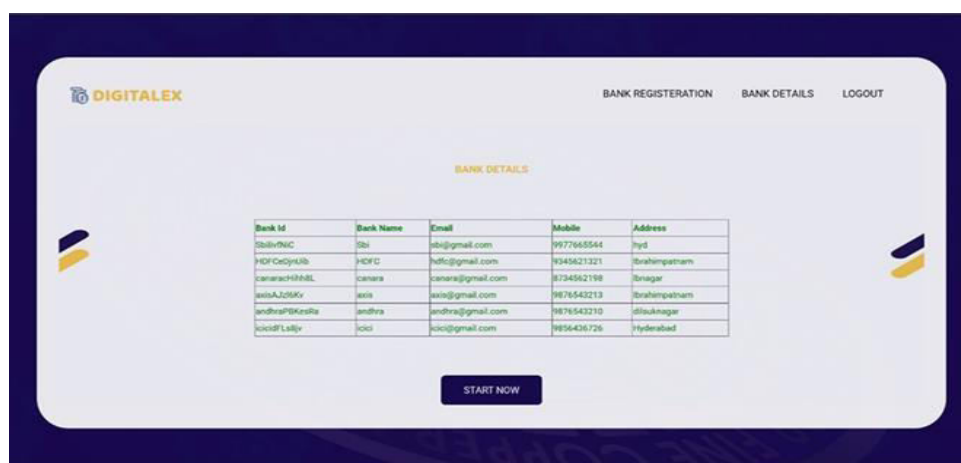


FIGURE 8: BANK DETAILS

IX. CONCLUSION

The blockchain-based KYC model was designed considering the private Ethereum network and PoS consensus mechanism. In this way, blockchain technology offers a transformative solution to the shortcomings of traditional KYC in banking. A shared, immutable ledger streamlines onboarding, bolsters data security, and enables real-time risk assessment. Regulatory hurdles persist, but the potential for enhanced efficiency, collaboration, and risk management within a secure and transparent framework is undeniable. As blockchain matures and regulations evolve, it has the potential to revolutionize KYC, ushering in a new era for secure and efficient customer identification in banking.

X. FUTURE ENHANCEMENT

Future enhancements in the KYC process using blockchain technology are likely to focus on increasing regulatory compliance and expanding its integration across diverse banking functions. As blockchain-based systems evolve, they will incorporate advanced cryptographic techniques and smart contracts to further bolster security and automate compliance processes. The use of non-fungible tokens (NFTs) to tokenize and manage Letters of Guarantee (LoGs) will enhance their authenticity and reduce the risk of fraud. Additionally, increased collaboration between banks and regulators will help address existing legal and compliance challenges, making blockchain-based KYC solutions more universally accepted and streamlined. These advancements aim to create a more secure, efficient, and collaborative financial environment.

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