

Loan management system with smart contract using Blockchain Technology

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Abstract-

The most shocking events were was the recent discovery of the fraudulent activities in the Punjab National Bank. This is due to frequent systemic failures that detect human errors. Blockchain technology is the greatest solution for this issue. It is surprisingly common for the information settlement mechanism like SWIFT to be on a isolated ledger from the payment settlement mechanism. If the banks uses a ledger that stores information settlement distributed across all the participants, then the fraudulent user may reflect on all the available participants in the transactions, auditors and regulators. Our Paper is a Decentralised Loan Management Web Application (DApp) built on Ethereum blockchain which targets on preventing such fraudulent attacks on Loans sanctions by decentralising the processes. The security features authentication of the user identity, authentication of bank officials and multiple levels of verification of details are implemented using Public Key Infrastructure (PKI). Financial institutions have made lives easier for a lot of individuals and organizations that would earlier use to face capital shortage now and then. Therefore, it becomes necessary to make the financial systems more reliable, secure, time-conserving, and cost-effective. Although several approaches have already been proposed, all of these tend to fail on at least one of the key features. Current financial loan management systems are usually deployed in a singleservice mode, also the transactions are not transparent and traceable to most of the roles participating in the process. Their data privacy protection mechanisms are not robust enough facing various cyber attacks. To overcome these challenges, we propose loan on blockchain (LoC), a novel financial loan management system based on smart contracts. We introduce digital signature and oracle to protect the data privacy

Key Words: Block Chain, Loan Management System, User Privacy, Smart Contracts.



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INTRODUCTION

The introduction of a bank loan management system utilizing blockchain technology marks a groundbreaking paradigm shift in the financial landscape. This innovative system harnesses the decentralized and secure features of blockchain to redefine the processes governing loan management within the banking sector. By employing smart contracts, the system automates the execution and enforcement of loan agreements, minimizing the need for intermediaries and promoting efficiency. The tokenization of assets on the blockchain introduces a new dimension to loan management, enabling fractional ownership and enhancing liquidity. With a decentralized ledger at its core, the system ensures an immutable and transparent record of all loan-related transactions, significantly reducing the risk of fraud and errors. This transformative technology extends its influence to identity verification, credit scoring, and asset valuation, contributing to a robust and reliable decision-making process. Moreover, the integration of blockchain technology facilitates real-time, auditable compliance with regulatory standards, offering a level of transparency and accountability that is

unprecedented in traditional banking systems. In essence, the introduction of a bank loan management system powered by blockchain signifies a pivotal moment in the evolution of financial services, promising increased security, efficiency, and accessibility.

1. PURPOSE

• Identify need of Project

The motivation behind implementing a bank loan management system using blockchain technology stems from the pressing need to address longstanding challenges within the traditional banking framework. Blockchain, with its decentralized and tamper-resistant nature, offers a transformative solution to enhance the efficiency, security, and transparency of loan management processes. In traditional systems, loan transactions are often encumbered by cumbersome paperwork, delays, and a lack of transparency. Blockchain technology eliminates these inefficiencies by automating processes through smart contracts, streamlining everything from application to approval and disbursement.

OBJECTIVE OF SYSTEM

- Enhance data security and integrity by leveraging blockchain's cryptographic features to prevent fraud and unauthorized access.
- Build trust among participants by eliminating the need for intermediaries and creating a tamper-proof record of loan agreements and repayments.
- Enable borrowers and lenders to interact directly on a decentralized platform, promoting financial inclusion.
- Ensure the integrity of borrower data and loan terms throughout the loan lifecycle.
- Design a system that can handle a growing volume of loans while maintaining performance and security.

LITERATURE SURVEY:

Hao Wang, Chaonian Guo, Shuhan Cheng et al., Current financial loan management systems are usually deployed in a single-service mode, also the transactions are not transparent and traceable to most of the roles participating in the process. Their data privacy protection mechanisms are not robust enough facing various cyber attacks. To overcome these challenges, we propose loan on blockchain (LoC), a novel financial loan management system based on smart contracts over permissioned blockchain Hyperledger Fabric. We use the Chinese poverty alleviation loan as the case study. We design a digital account model for the transfer of assets between centralized and decentralized ledgers; and propose locking and unlocking algorithms for smart contracts. We introduce digital signature and oracle to protect the data privacy. Performance evaluations on chaincode and unlocking codes show that our system is applicable in the real financial loan setting.

Arikumar K. S., Deepak Kumar, Gowtham C, Sahaya Beni Pratibha et al., The most shocking events were the recent discovery of the fraudulent activities in the Punjab National Bank. This is due to frequent systemic failures that detect human errors. Blockchain technology is the greatest solution for this issue. It is surprisingly common for the information settlement mechanism like SWIFT to be on an isolated ledger from the payment settlement mechanism. If the banks use a ledger that stores information settlement distributed across all the participants, then the fraudulent user may reflect on all the available participants in the transactions, auditors and regulators. Our Paper is a Decentralised Loan Management Web Application (DApp) built on Ethereum blockchain which targets on preventing such fraudulent attacks on Loans sanctions by decentralising the processes. The security features authentication of the user identity, authentication of bank officials and multiple levels of verification of details are implemented using Public Key Infrastructure (PKI).

Kwame Omono Asamoah; Adjei Peter Darko; Collins Opoku Antwi; Seth Larweh Kodjiku et al., In developing countries, funding is a significant obstacle to receiving higher education. Brilliant but needy students cannot complete their studies since their parents are unemployed and their countries' economies are poor. As a result, the students' talents are not harnessed to their full potential. In order to help students obtain higher education and harness their full potential, governments provide student loans to students in higher education. The government provides loans to students through the ministry of education. The students pay back the loan with

interest when they start working. Governments have been the sole funders of student loans. The emergence of COVID-19 and the Russia-Ukraine war have resulted in a global economic crisis. Because of the global economic crisis, the government's spending has increased. In order to help reduce the burden of government and thereby reduce spending, we intend to revolutionize the student loan program through blockchain and crowdsourcing

Tianqi Jia; Cuiying Wang, Knowledge Discovery of Prescriptions and Similar Prescriptions of Guizhi Decoction Based on Structural Partial-Ordered Attribute Diagram, 2013 Third International Conference on Instrumentation, Measurement, Computer, Communication and Control: As a new tool of data analysis and knowledge processing, formal concept analysis has drawn more and more attention in various fields. This research focuses on prescriptions of GuiZhi Decoction, which is from Zhongjing Zhang's Treatise on Cold Pathogenic Diseases. First, we constructed the database for prescriptions of GuiZhi Decoction based on the prescriptions' names, the concept extraction and formal expression. Then we generate the formal context and optimized it by use of the mathematical theory of formal concept analysis and the relationship between prescriptions and herbs in database. In the formal context, the prescriptions are objects and the herbs are attributes. Next the structural partialordered attribute diagram is generated, so as to visualize the knowledge of prescriptions of GuiZhi Decoction. Finally, through the analysis of structural partial-ordered attribute diagram, more comprehensive, objective and multileveled knowledge are discovered.

PROPOSED SYSTEM

- The bank loan management system needs to integrate with existing legacy banking systems to ensure a smooth transition and coexistence with traditional banking processes.
- To assess the creditworthiness of borrowers, the system may need to connect with external credit bureaus, financial institutions, or data providers to gather relevant information for decision-making.
- Seamless integration with payment systems is crucial for handling fund transfers, repayments, and other financial transactions. This includes compatibility with traditional banking payment systems as well as emerging blockchain-based payment solutions

USE CASE DIAGRAM

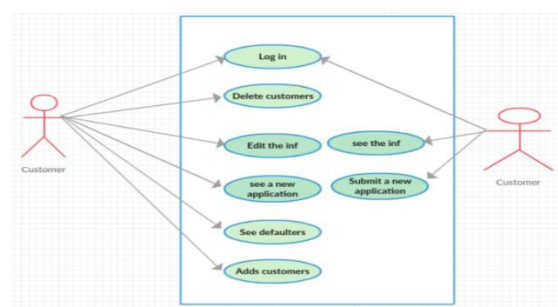


Fig -1: Use Case Diagram

ADVANTAGES

- Easy to used system
- Control system from anywhere
- Centralized system

SYSTEM REQUIREMENTS

- **Software Used:**
 1. Programming Language – Python
 2. Libraries – NumPy, TensorFlow, Keras, OpenCV, Streamlit
 3. Database – SQLite
 4. Tools – Visual Studio Code

5. Algorithm – Sha256

- **Hardware Used:**
 1. Processor – i3 or above
 1. Hard Disk – 150 GB
 2. Memory – 4GB RAM

RESULT



Fig.(1)

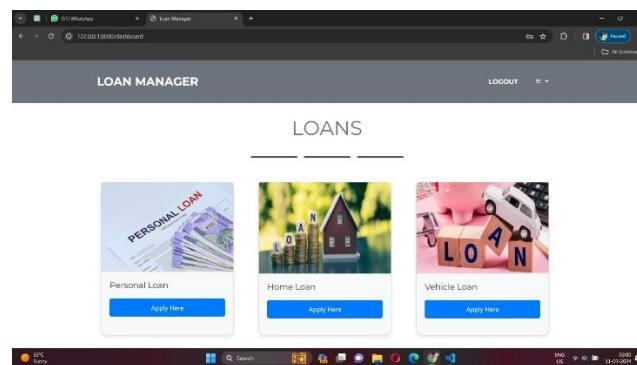


Fig.(2)

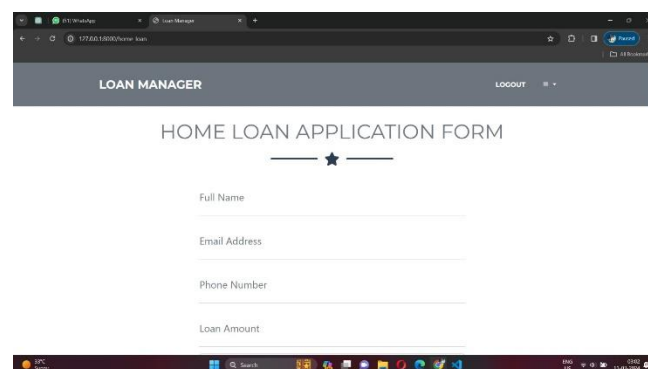


Fig.(3)

CONCLUSION

In real-time, the system securely shares the details about transactions by organizing the network, this action prevents the frauds in the system. Our proposed system maintains the privacy of the valuable customers by eliminating the attackers or frauds who injecting vulnerable data. By our proposed system, the banks in India can be completely digitalized without any hesitation from the hackers and the attackers. Thus, the integration of blockchain in the loan management system incorporates easier, faster, and cheaper solutions, which can be adapted by the existing banking systems for experiencing the high-level security and privacy. The proposed

"Bank Loan Management System using Blockchain Technology" offers a revolutionary solution to the limitations of the existing loan management system. By harnessing the power of blockchain, it ensures transparency, security, and efficiency in loan processing, ultimately benefiting both borrowers and financial institute

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