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KYC VERIFICATION USING BLOCKCHAIN

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Abstract - *KYC (Know Your Customer) is a requirement set forth by the Reserve Bank of India as a way for institutions to confirm and subsequently confirm the legitimacy of consumers. Before investing in a range of financial instruments, they must submit their KYC papers to prove their identity and address. The costly and time - consuming Know Your Customer (KYC) process is now an important yet trivial issue in the financial sector. Customers must go through the same procedure for any bank or financial institution they desire to cooperate with, which makes the process tedious for them as well. The amount of time it takes depends on how each person uses the method, so a time-saving alternative is necessary. This paper aims to provide a solution to this issue. We put forth a solution based on blockchain which performs single KYC verification and maintains a single secure database, eliminating the need for multiple KYC checks. Only with the user's permission will various financial institutions present on the blockchain network be able to access the user's KYC information. Since the user has control over the data, we even do away with third-party intervention. It is up to the user to accept or reject the bank's request to view their KYC information. Financial institutions would be able to produce better compliance results, boost efficiency, and enhance customer experience by sharing KYC information on Blockchain.*

***Key Words*: Blockchain, KYC Verification, Financial Institution, Customer, Bank**

1. INTRODUCTION

KYC is the process by which banks gather information about the customers' identities and addresses. Due diligence is a process that is supervised by regulators that is used to confirm the legitimacy of clients. This process aids in preventing the exploitation of banks' services. The KYC process must be completed by the banks when opening new accounts. Additionally, banks are expected to routinely update the KYC information for their clients. Traditional KYC's main drawbacks are that it is manual, time-consuming, requires third-party involvement, and is redundant across institutions. We intend to overcome these drawbacks with our proposed blockchain-based approach. We intend to simplify the KYC verification process by allowing banks to perform a one-time KYC check that can be accessed by multiple financial institutions via the blockchain network. We even eliminate the need for redundant KYC checks, which saves time. Over the blockchain, we maintain a single secure database. To gain access to the details, the bank must first obtain the user's permission. It is up to the user to approve or deny the bank's request to access the KYC details. We eliminate third-party intervention by giving the user control over his data.

2. RELATED WORK

A method based on distributed ledger technology was proposed by Bharti Pralhad Rankhambe et al. [1] with the aim of lowering overall KYC expenses for banks cooperating in a regulatory authority while avoiding redundant tasks performed by different financial institutions. The proposed system enhances effectiveness, drastically lowers costs, and increases transparency throughout the integration of customer records into the bank database, enhancing customer satisfaction by removing the need for middlemen.

Any firm can request the data by submitting a service proof of identity using the consortium blockchain approach proposed by Ashok Kumar Yadav et al. [2].Every organization receives an identity to keep track of the record. Due to data being saved online on the blockchain, maintenance costs associated with duplicate information will also be eliminated, and paperwork will be significantly reduced. The proposed approach to KYC verification optimizes data storing, updating, sharing, and accessing processes while enhancing security, transparency, and privacy. It does this by utilizing the DLT, cryptography, and consensus mechanism of blockchain. Additionally, it increases customer ownership and enriches the customer experience. Every institution that is acting as a peer in a consortium network under the proposed approach is only able to verify the details, not modify them. Finally, while internal operations inside each business are spread, they appear to be one cohesive unit from the outside.

E. Sai Vikas Reddy et al. [3] proposed an approach based on blockchain technology that lowers the expense of the standard KYC verification process. Regardless of the number of institutions each customer registers, the entire verification procedure is only performed once for each of them, boosting transparency by safely communicating the results through DLT. Here, the customer only registers with one financial institution, decreasing the need to register with various financial institutions and eliminating duplication of effort. With this approach, ethereum is used for proof of

concept (POC). This approach improves customer satisfaction, boosts transparency, and lowers overhead costs.

An approach based on a self-governed and distributed Know-Your-Consumer (DKYC) architecture was proposed by Syed Azhar Hussain et al. [4] that enhances customer privacy through prior permission provision, facilitates regulator oversight, and helps banks use reliable and valid customer details while lowering the cost associated with customer acquiring. The scoring system is constructed via the Proof of Importance consensus algorithm. This enables current conventional identity establishments, such as Civilian Identities, Regulators, National Security Numbers, and other private sector identity stores, to participate and be a member of the network in order to determine the scoring.

Prof. A. L. Maind et al. [5] proposed a blockchain-based approach which eliminates middlemen and enables one-time KYC for users. Users have access to the data at any time, from any location, for a variety of purposes. Blockchain technology's decentralized ecosystem, user transparency, and lack of third-party meddling increase its security. Additionally, faster processing is guaranteed.

An IPFS-based blockchain approach was proposed by Abdullah Al Mamun et al. [6]. Customers can utilize the proposed approach to open an account in one financial institution, go through KYC verification there, and then use the IPFS network to create a hash value and a distinct decryption key which can be shared using blockchain. If a customer wants to open a new account at any bank or financial institution, they can retrieve and safely store customer details over the IPFS network. The file is compressed and encrypted for additional security before distributing it via the IPFS network. Anyone with knowledge of the IPFS network's hash values can access the contents. Gpg4win encryption software is utilized in the Kleopatra platform so that users can access encrypted KYC documents.

An IPFS-based KYC using a distributed ledger was proposed by Nikita Singhal et al. [7]. The immutability of Distributed Ledger Technology and the Inter Planetary File System is used to construct a tamper-proof system. Customers and corporate institutions can validate and add their KYC records to the DLT. The proposed system utilizes IPFS, which significantly boosts DLT's storage effectiveness. As there is no involvement from a third party, the customer benefits from this approach.

A blockchain-based approach was put forth by Dr. Manoj Kumar et al. [8] to address the redundant and ineffective nature of the present KYC process, significantly reducing the system's operating expenses. By keeping the data in an encrypted format and giving the user access to the decryption keys, this approach tackles the problem of data ownership. The actual customer data is not saved on the blockchain, hence the decision made about the blockchain has no bearing on the proposed solution.

3. METHODOLOGY

Begin by running the ganache-cli command in one terminal, which will display available accounts as well as private keys. Additionally, it initiates the wallet. And then run the node init.js command on the other terminal. Afterwards, a 20-byte address would be produced, serving as the smart contract's compilation address. This address must be inserted into the variable contractAddress, which we will obtain when we execute the contractDetails.js file in the text editor.

The application is now ready for use, and we need to make sure ganache-cli is running and that we have a working internet connection all the way through the process.

In the blockchain network, the bank must now register itself by providing its name and password. Following successful registration, the block for that specific bank and the timestamp at which it was registered will be shown on the Ganache client terminal. Once the bank has logged in with required credentials, bank can view details, view KYC, add KYC, and modify KYC. The bank can add KYC by filling out the personal details form and providing the bank declaration. When the bank attempts to view KYC, the username will now be prompted. When the username is entered, access is refused and it is advised to obtain the user's permission before accessing the KYC information. The user must register on the customer portal. After successfully registering, the user can log in with the required credentials and view the KYC details that the bank has added. The user will receive the bank request over the view request. The user has the option of approving or rejecting the bank request. User approval is required for the bank to access the KYC details; otherwise, if the user rejects the request, the bank cannot access the KYC details.

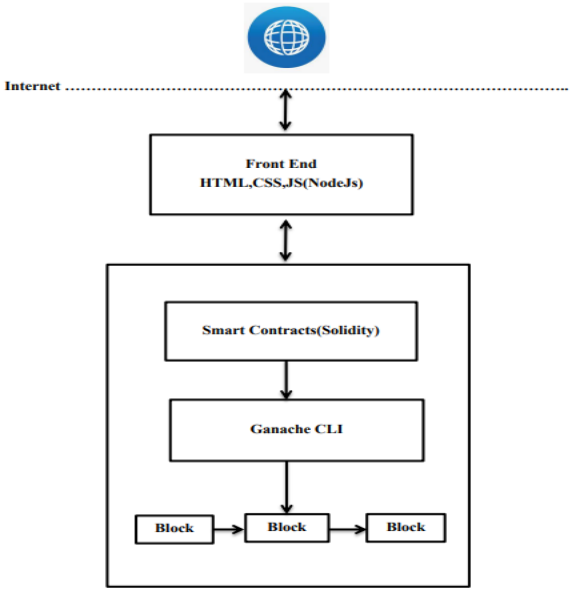

Fig -1: Architecture of Blockchain

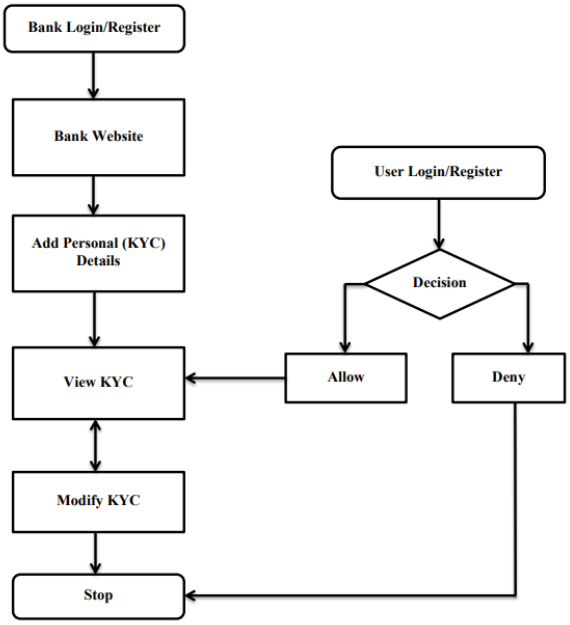

Fig -2: general Flow of KYC Verification using Blockchain

4. RESULTS

The system performs a one-time KYC verification, and multiple financial institutions can access these details over the blockchain network. In order to access the information, the bank must send a request to the user. The decision to allow or deny access to information is up to the user.

Some of the screenshots of the system are provided below:

```
Listening on 127.0.0.1:8545
eth_accounts
eth_sendTransaction

  Transaction: 0xd7bc135d276ea6a9d73dc9f2742bc948c2fd670bd9da7802cbb3feda3dd51a92
  Contract created: 0xe683a6ef3e787d82d4b7c7d79c10f64d3f26b3e5
  Gas usage: 2930772
  Block Number: 1
  Block Time: Sat Jul 02 2022 19:50:45 GMT+0530 (India Standard Time)

eth_newBlockFilter
eth_getFilterChanges
eth_getTransactionReceipt
eth_getCode
eth_uninstallFilter
eth_accounts
eth_sendTransaction

  Transaction: 0xa03ffdc877ef1b954374663f71b14d066c211f731df5193c18cdb1001dfc0267
  Contract created: 0xe09ac2c9bacde0552907ecbcc38b91629536ca47
  Gas usage: 2965278
  Block Number: 2
  Block Time: Sat Jul 02 2022 19:53:15 GMT+0530 (India Standard Time)

eth_newBlockFilter
eth_getFilterChanges
eth_getTransactionReceipt
eth_getCode
eth_uninstallFilter
eth_accounts
eth_sendTransaction

  Transaction: 0x2a628bf1ea5d17b48533f002a325b8942f3ce1a6d757dd86c37324dd85c65619
  Gas usage: 131879
  Block Number: 3
  Block Time: Sat Jul 02 2022 19:53:57 GMT+0530 (India Standard Time)
```

Fig -4: Block Creation

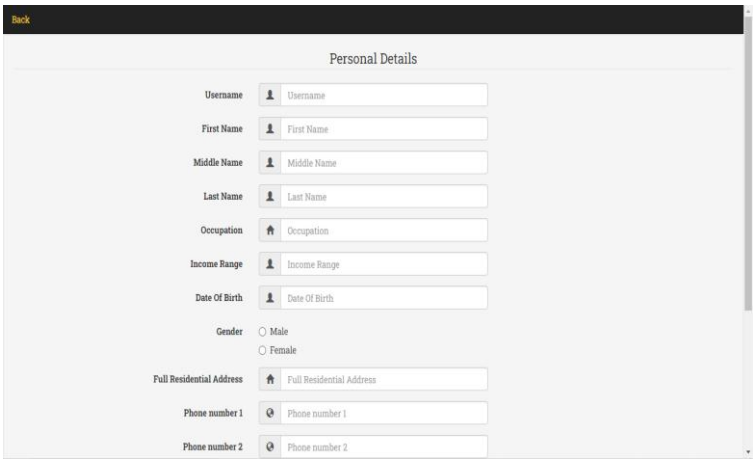

Fig -5: Adding Personal Details Page

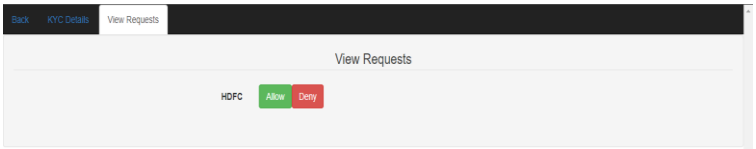

Fig -6: Customer Bank Request Page

4. CONCLUSION

Our proposed approach aims to make the KYC verification process simpler. Data is made more secure and tamper-proof by maintaining a single secure database over blockchain, which also gets rid of the redundant KYC checks carried out by financial institutions. It even saves time, as well. We even do away with third party meddling because the user is given ownership over the data.

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