MAJOR PROJECT

IMPLEMENTATION OF BLOCKCHAIN IN FINANCIAL SECTOR TO IMPROVE SCALABILITY

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ABSTRACT

The Blockchain is an encrypted database that stores information statistics, or in different words, it is a virtual ledger of any transactions, contracts - that needs to be independently recorded.

One of the key capabilities of Blockchain is that this virtual ledger is out there throughout several masses and heaps of computer and isn't always sure to be stored in a single place.

The aim of the project is to conduct research on the effect of blockchain technology on the financial sector. There is no doubt that the world is curious to see how this promising technology will influence or shape the future of banking. Blockchain enhances safety in data storage and transmutation, avails a decentralized and transparent network infrastructure and significantly reduces the costs in operations.

These remarkable attributes make blockchain a very promising and in-demand solution even in an industry as restricted as the banking sector.

INTRODUCTION

A blockchain is a distributed digital ledger where transactions can be recorded and checked electronically over a network of computers in the absence of a central ledger. Cryptography is used to protect the data from deception or hackers[1].

It was invented by "Satoshi Nakamoto" in 2008. A blockchain helps to record all the transactions made so that no alterations can be made later on so as to maintain the security of the data.

The duplicated shared ledger concept in blockchain technology can help remove these weaknesses[2].

The execution of blockchain will empower pointless arbiters to be relinquished and give clients and banks less expensive administrations.
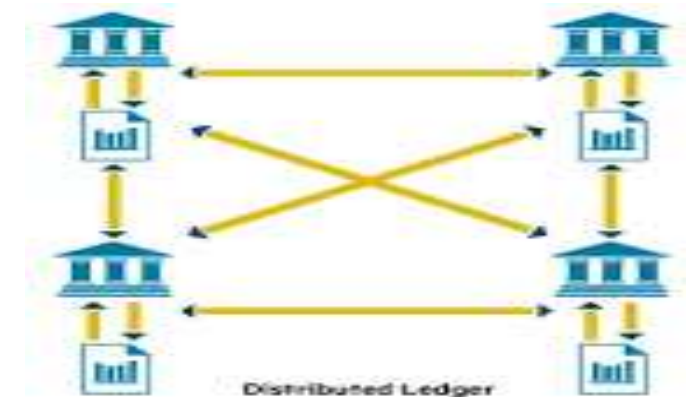
EXISTING SYSTEM AND IT'S DRAWBACKS

There this record book shows every transaction that has ever happened in chronological order and we each hold an exact copy of it because of the way the pages are bound together trying to go back and change past trades would be practically impossible and because we each hold a copy of it we would know if something went wrong, this shared record book is essentially a blockchain.

A blockchain is a distributed, immutable ledger or record of transactions. Distributed means that it's shared and stored in multiple locations removing a single point of failure and providing perceptibility across massive participants. Immutable means that it's nearly impossible to go back and change the past records once they have been agreed by and attach using cryptography.

- Less accuracy

- low Efficiency

- Difficulty in tracking previous transactions

PROPOSED SYSTEM

Nevertheless closely reliant and dependent on paper, despite the fact that dressed up with a virtual appearance, there are various problems with this era.

In spite of the monetary employer's resistance to trade, blockchain and its anticipated benefits make it worthwhile. Blockchain, not like traditional structures, is dynamic enough to come to be a pacesetter in implementation in a chargeable market situation.

In a blockchain, the best advantage it guarantees is that every celebration has a report that is maintained in a ledger to be had to everyone.

It is a ledger extensively surpassed between special users thereby developing a shared database that is replicated to those users and who can get right of entry to it simplest when they have the get admission to the right for it.
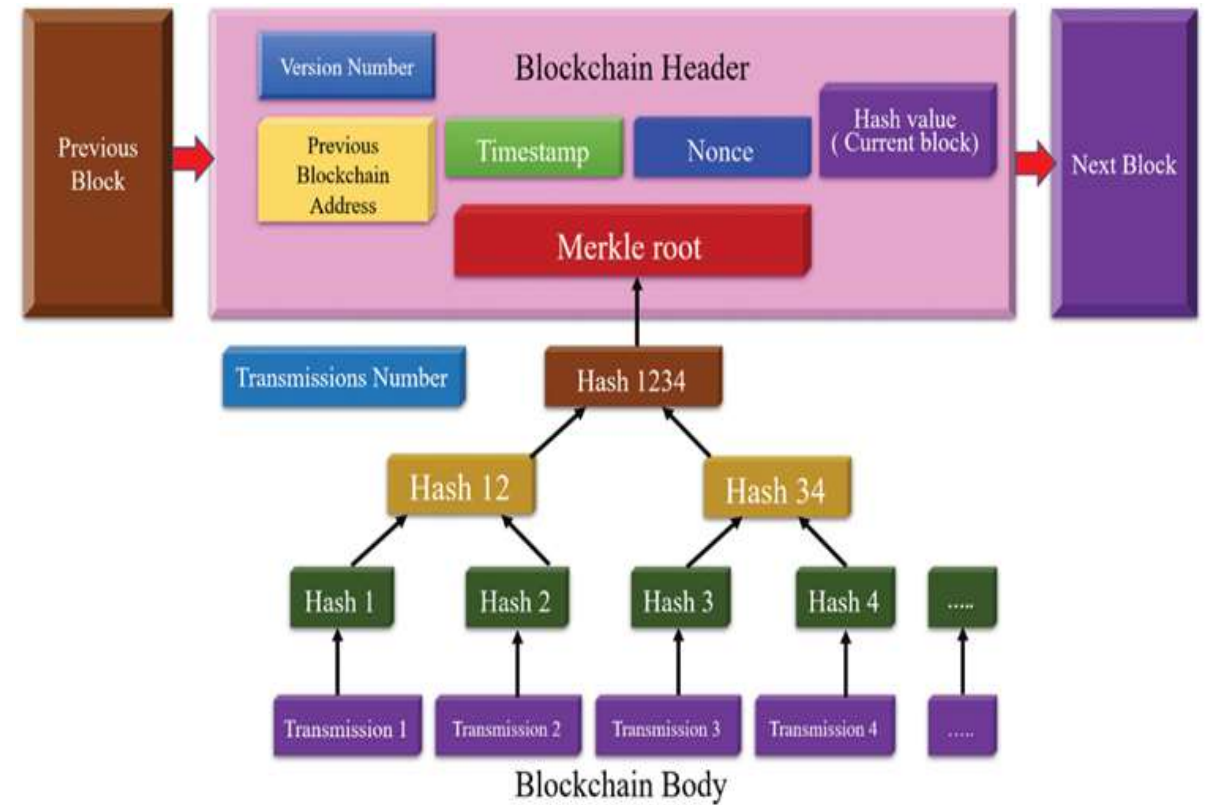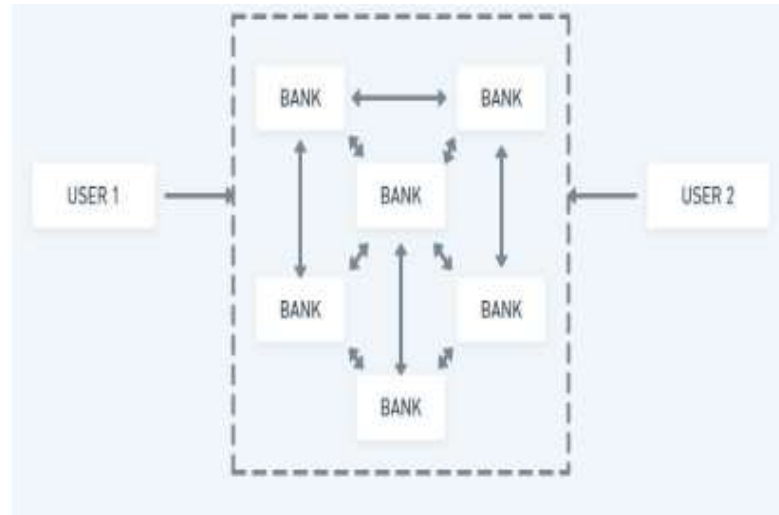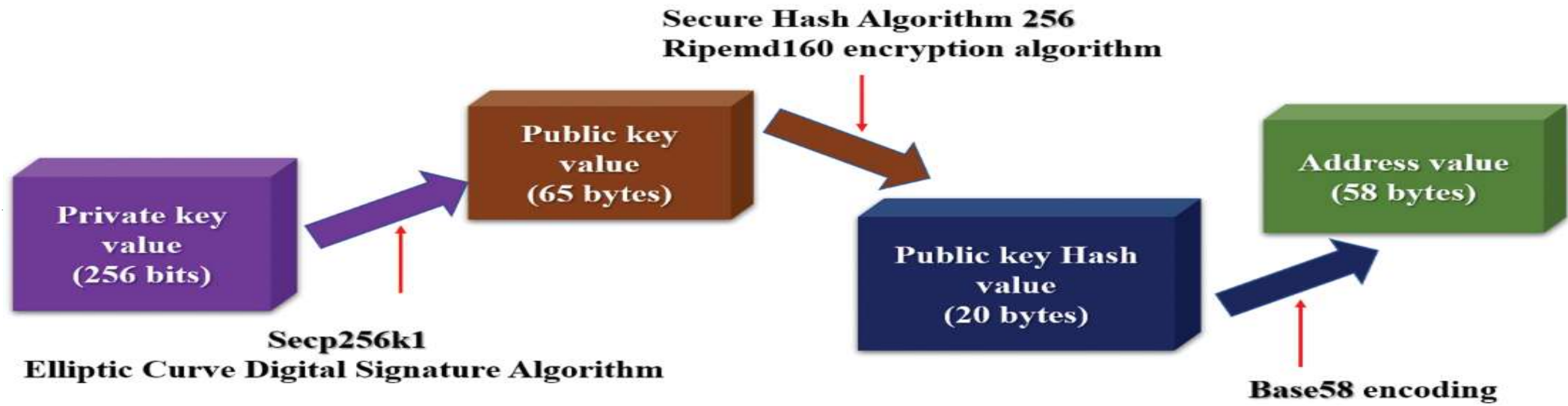
ADVANTAGES OF PROPOSED SYSTEM

- High accuracy

- High efficiency

- On-chain settlement

- Low transfer fees

- 24*7 Availability

- Transparency

S.No.	Current Pain Points	How Blockchain Can Help
1.	Laboring Documentation	Automated Documentation
2.	Time-consuming process	Real time settlement of transaction
3.	Lack of mechanism to track throughout the process	Real time-tracking of transaction
4.	Potential of fraud	Fraud proof

Table 1. Easy Payment through Blockchain

BLOCK DIAGRAM AND GRAPHICAL REPRESENTATION

Secure Hash Algorithm 256
Ripemd160 encryption algorithm

Public key
value
(65 bytes)

Address value
(58 bytes)

Private key
value
(256 bits)

Public key Hash
value
(20 bytes)

Secp256k1
Elliptic Curve Digital Signature Algorithm

Base58 encoding

Message

Hash
Algorithm

7856gdf32s
dc89b......

Message Digest
(fingerprint)

ALGORITHM

Input: The previous block hash value, the current block number, the current clock data, and timestamp

Output: Nonce value and the current block hash value

Method:

Step 1: Set the first four digits of the current block hash value to zeros (set by the system), and then mine the nonce value.

Step 2: $nonce = 0$

Step 3: while (the first four digits of the current block hash value are equal to zero)

{

   Step 3.1: Calculate the current block hash value

   Step 3.2: $nonce = nonce + 1$

}

Step 4: Return nonce value and the current block hash value

end

HARDWARE REQUIREMENTS

System : i3 or above

Ram : 4GB Ram.

Hard disk : 40GB

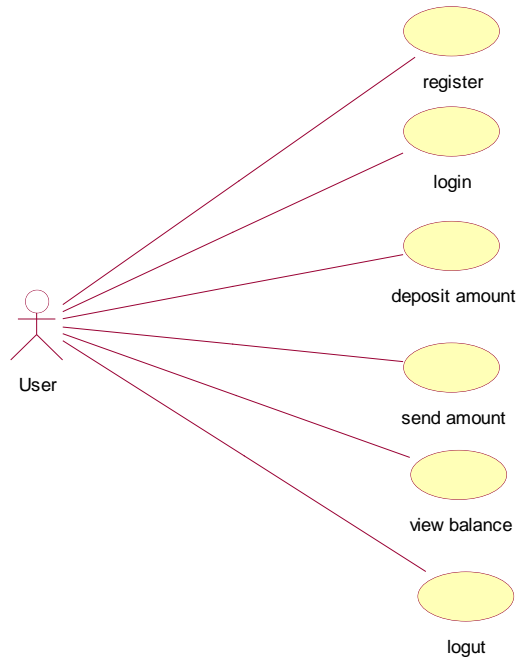## SOFTWARE REQUIREMENTS

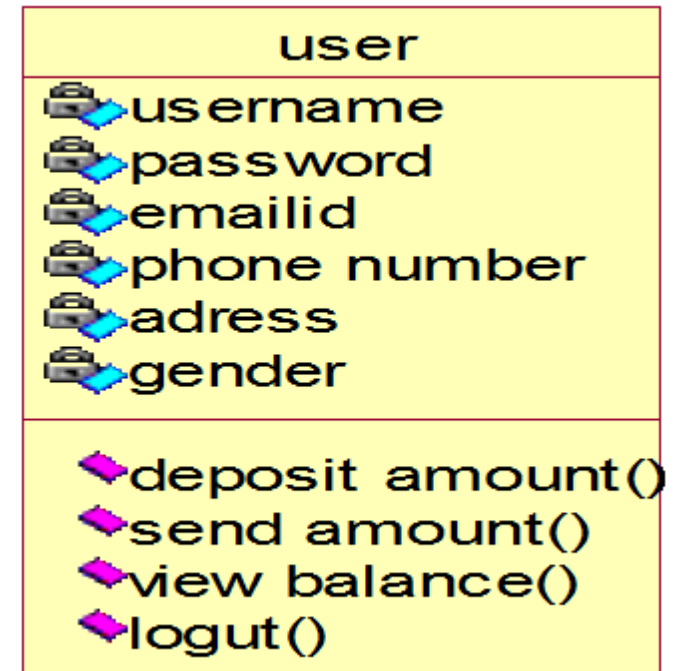Operating system : Windows

Coding Language : Python

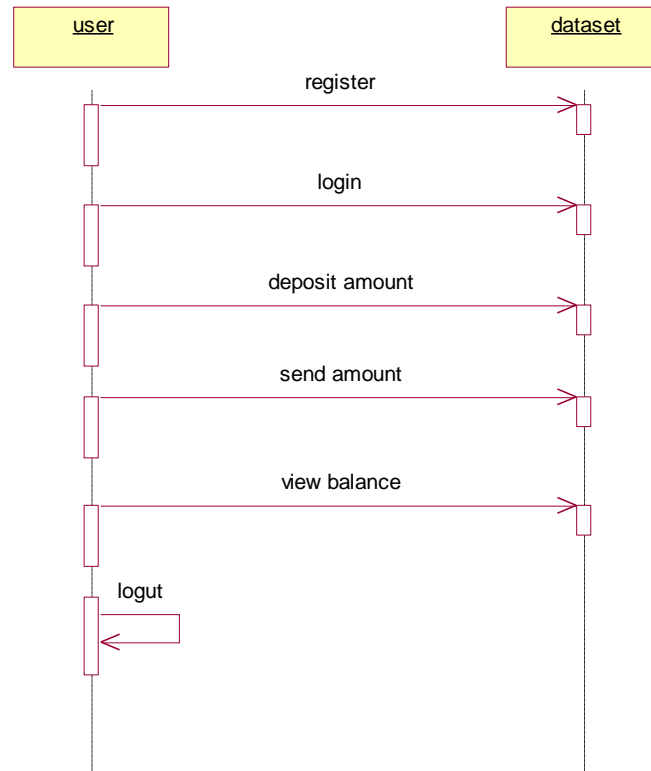## MODULES USED IN PROJECT

- Django

- Web3

UML DIAGRAMS

Use case Diagram

Class Diagram
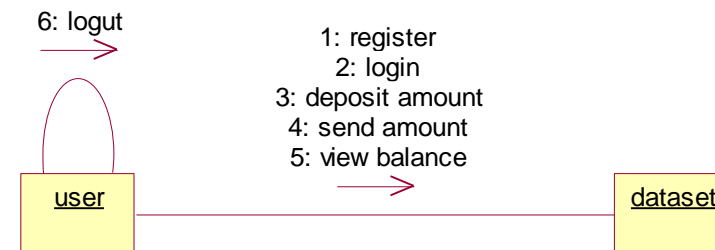
UML DIAGRAMS

user

dataset

register

login

deposit amount

send amount

view balance

logut

Sequence Diagram

6: logut

1: register
2: login
3: deposit amount
4: send amount
5: view balance

user

dataset

Collaboration Diagram

IMPLEMENTATION


```
BankContract.sol
1    pragma solidity >= 0.8.11 <= 0.8.11;
2
3    contract BankContract {
4        string public users;
5        string public bankaccount;
6
7        constructor() {
8            users = "empty";
9            bankaccount = "empty";
10       }
11
12       function addUsers(string memory u) public {
13           users = u;
14       }
15
16       function getUsers() public view returns (string memory) {
17           return users;
18       }
19
20       function bankAccount(string memory ba) public {
21           bankaccount = ba;
22       }
23
24       function getBankAccount() public view returns (string memory) {
25           return bankaccount;
26       }
27   }
```

```
Migrations.sol
1    // SPDX-License-Identifier: MIT
2    pragma solidity >= 0.8.11 <= 0.8.11;
3
4    contract Migrations {
5        address public owner = msg.sender;
6        uint public last_completed_migration;
7
8        modifier restricted() {
9            require(
10               msg.sender == owner,
11               "This function is restricted to the contract's owner"
12           );
13           _;
14       }
15
16       function setCompleted(uint completed) public restricted {
17           last_completed_migration = completed;
18       }
19   }
```

IMPLEMENTATION

Similarly you can create N users and send money which running code TRUFFLE ETHEREUM tool and DJANGO SERVER must be running and this server I am showing below screen

```
2_deploy_contracts.js
=====================

   Replacing 'BankContract'
   -----------------------
   > transaction hash:      0xac6cabaf26b7d63d5d98c8dc4d77490e4c905be5d93043c44d8bb47eb8bf33f8
   > Blocks: 0            Seconds: 0
   > contract address:      0x1DD4fb45C1cdC8C3f32cbaA60464c8107D4D4058
   > block number:          3
   > block timestamp:       1651852417
   > account:               0xc7B56c1B125271E1dEeDffA10a84a83cC620313f
   > balance:               99.998434972
   > gas used:              491147 (0x77e8b)
   > gas price:             2 gwei
   > value sent:            0 ETH
   > total cost:            0.000982294 ETH


   > Saving migration to chain.
   > Saving artifacts
truffle(develop)>
```

```
---------------------

   Replacing 'Migrations'
   ---------------------
   > transaction hash:      0x708a6308bd891b88902efe308257e92fd00123fa0834c432f4290137326362df
   > Blocks: 0            Seconds: 0
   > contract address:      0xBd40920F34363101BC90C4c67D7Eb1A1f819cc9A
   > block number:          1
   > block timestamp:       1651852412
   > account:               0xc7B56c1B125271E1dEeDffA10a84a83cC620313f
   > balance:               99.999502292
   > gas used:              248854 (0x3cc16)
   > gas price:             2 gwei
   > value sent:            0 ETH
   > total cost:            0.000497708 ETH


   > Saving migration to chain.
   > Saving artifacts
   ------------------------------------
   > Total cost:            0.000497708 ETH
```

IMPLEMENTATION

Double click on 'run.bat' file to start 'DJANGO' web server like shown in the below screen

DJANGO has server started and now the server can be accessed at http://127.0.0.1:8000/index.html

OUTPUT SCREENS

Home Screen:

Sender's Balance sheet

Implementation of Blockchain in Financial Sector to Improve Scalability

| Deposit Amount | Send Amount | View Balance | Logout |

View Balance Screen

Username	Amount	Transaction Date	Transaction Status
harsha	500000	2023-03-21 18:56:47	Self Deposit
Current Balance : 500000.0			

RECEIVER'S BALANCE SHEET

𝄢: Implementation of Blockchain in Financial Sector to Improve Scalability

| Deposit Amount | Send Amount | View Balance | Logout |

View Balance Screen

| Username	Amount	Transaction Date	Transaction Status
dgp	500.0	2023-03-21 19:00:11	Received From harsha
Current Balance : 500.0			

Representation of Blocks

Json file

Used for Serializing structured data and exchanging it over a network mainly between a server and a web application

```
4265        },
4266        "networks": {
4267          "5777": {
4268            "events": {},
4269            "links": {},
4270            "address": "0xE0922cD992b33E2568E6c83F101468c222b3edEc",
4271            "transactionHash": "0xf709b58da679b7eebea67a6c729ce24cc2cdda49ccc36c940cc91e92d7b8d45d"
4272          }
4273        },
4274        "schemaVersion": "3.4.4",
4275        "updatedAt": "2023-03-21T13:23:05.214Z",
4276        "networkType": "ethereum",
4277        "devdoc": {
4278          "kind": "dev",
4279          "methods": {},
4280          "version": 1
4281        },
4282        "userdoc": {
4283          "kind": "user",
4284          "methods": {},
4285          "version": 1
4286        }
4287      }
```

CONCLUSION

- Blockchain technology has the potential to greatly improve scalability in the financial sector.
- By utilizing a decentralized and secure system, blockchain can increase efficiency and reduce costs and also reduce the risk of fraud
- Blockchain can result in significant cost savings for both businesses and consumers.
- Looking to the future, blockchain technology has the potential to play an increasingly important role in the financial sector.
- The global blockchain market is expected to be worth $1,431.54 billion by 2030, growing at a CAGR of around 85.9% from 2022-2031.

BLOCKCHAIN FOR VOTING AND ELECTIONS
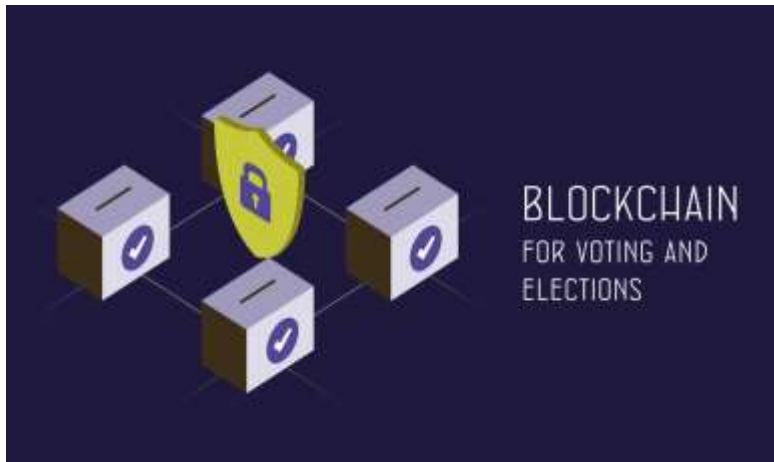
REFERENCES

[1] Saah, Shalilak Jani, "Applications of Blockchain Technology in banking and finance", Parul University, Vadodara, India, February 2018 DOI: 10.13140/RG.2.2.35237.96489

[2] DUSKO KNEZEVIC, "Impact of blockchain technology platform in changing the financial sector and other industrutries., University Union Belgrade, Serbia, Montenegrin Journal Of Economics, Vol. 14, No. 1(2018), p.p(109-120).

[3] Lin William Cong Zhiguo He Working Paper 24399 http://www.nber.org/papers/w24399 NATIONAL BUREAU OF ECONOMIC RESEARCH 1050 Massachusetts Avenue Cambridge, MA 02138 March 2018, Revised April 2018

[4] Soonduck Yoo, (2017) "Blockchain based financial case analysis and its implications", Asia Pacific Journal of Innovation and Entrepreneurship, Vol. 11 Issue: 3, pp.312-321 https://doi.org/10.1108/APJIE-12-2017-036

[5] C. Miguel and L. Barbara, "Practical byzantine fault tolerance," in Proceedings of the Third Symposium on Operating Systems Design and Implementation, vol. 99, New Orleans, USA, 1999, pp. 173–186.

Thank you