EFFICIENT AND DISTRIBUTED BANKING SYSTEM USING BLOCKCHAIN TECHNOLOGY

[1] Komal G. Pabale

[1] M.E. Student ,[1] Department of Computer Engineering,
Savitribai Phule University,
[1]AVCOE ,Sangamner , India

[2]Prof. M.A. Wakchaure,

[2]Professor, [2] Department of Computer Engineering,
Savitribai Phule University,
[2]AVCOE ,Sangamner , India

Abstract: Blockchain, also referred to as a distributed ledger technology, stores different transactions /operations during a chain of blocks in a very distributed manner while not having a trusted third-party. The Blockchain could be a chain of blocks each is being a storehouse that stores information pertaining to a transaction and links to the sooner block within the same transaction. These connected blocks form a sequential chain providing a pathway of the essential transaction. There are many threats and frauds detected in industry. A centralized database is employed by banking industry which makes the attacker easy to urge access to data and this makes the system insecure. the disadvantage of this centralized system may be reduced by reforming the system by implementing blockchain technology without using tokens. Blockchain uses decentralized architecture for storing and accessing data over the database. This reduces attacks on database hacked. Transactions done through the blockchain technology are verified by each block within the chain, which can make the transaction safer and help banking industry work faster. Proposed system aims at giving these functionalities in a very distributed banking industry using blockchain, which is able to be at par with this methodologies. It'll also concentrate on the restrictions while implementing blockchain and future scope.

keywords - Blockchain, Traditional Banking, Cryptography, Transaction.

I. INTRODUCTION

Any banking system being the middleman between the transactions is vulnerable to threats like frauds, crashes, and cyber-attacks. Since almost all the banking systems are based on a centralized database, they are more prone to penetration attacks, which may compromise the confidential details of customers of the bank. As well as for the services provided by the bank, the customer has to pay the transactional overhead. On the other hand, the bank has to record and maintain all the transactional details for each customer, which is generally massive in terms of data.

Blockchain technology is the solution to these problems of the current traditional banking system. Blockchain technology originated when a white paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System" was released in 2008 by Satoshi Nakamoto. This study illustrates how to develop a peer-to-peer electronic cash system that allows online transactions between different parties without the involvement of the mediator. The World Economic Forum (WEF), in 2016 has suspected that blockchain technology will be able to transform financial services in the banking sector by creating a platform that connects consumers and producers directly.

Blockchain could be a decentralized ledger accustomed securely exchange digital currency, perform deals and transactions. Each member of the network has access to the most recent copy of encrypted ledger in order that they will validate a brand new transaction. Blockchain ledger could be a collection of all Bitcoin transactions executed within the past. Basically, it's a distributed database which maintains a continuously growing tamper proof organisation blocks which holds batches of individual transactions. the finished blocks are added in a very linear and chronological order. Each block contains a timestamp and information link which points to a previous block. Banking and financial institutions are using Blockchain based technology to scale back risk and forestall cyber fraud . A block will have one parent but can have multiple child each bearing on the identical parent block hence contains same hash within the previous block hash field. Every block contains hash of parent block in its own header and therefore the sequence of hashes linking individual block with their parent block creates a giant chain pointing to the primary block called as Genesis block.Bitcoin is peer-to-peer permission-less network which allows every user to attach to the network and send new transaction to verify and make new blocks.

The blockchain technology could be a peer-to-peer distributed structure which can be wont to overcome the difficulty within the traditional industry. it's a group of blocks that hold the encrypted transactional details sharing the identical timestamp. The nodes of the network (miners) are to blame for linking the blocks to 1 another in chronological order, where each block contains the hash of the block created before within the chain. These hash values are the digital signature of every block and are hooked in to two variables, first being the transactional details, and second is that the hash value of the previous block. There are multiple hashing algorithms like SHA256, RSA to attain this. Even a moment change in any of the 2 variables will have a big influence on the digital signature throughout the blockchain; thus overall, it provides an honest security measure in an exceedingly public ledger.

TYPES OF BLOCKCHAIN:-

1. **Public Blockchain**

   Public blockchain are open-source. Anyone can participate during this blockchain, means anyone can participate within the transaction aided by the Blockchain, every participant can see what blocks are becoming added and so anyone can participate within the consensus process i.e. the method of what blocks get added to the chain and what this state is just.

2. Hybrid blockchain

By actually occupying a singular place within the blockchain ecosystem therein it's a hybrid blockchain, which suggests that it combines the general public blockchain privacy benefits that provides businesses significant flexibility to settle on what data they require to create public and transparent and what data they require keep private.

3. Permissioned or closed-loop Blockchain

The distinction in an acknowledged blockchain as compare to the general public blockchain is that the correct to certify the transaction is provided to only little or no pre-selected nodes. the proper for reading the blockchain could also be public, or may restricted to the participants.

4. Private Blockchain

Private blockchain simply says, write permissions are restricted to 1 organisation. Major applications include direction, auditing i.e. specific area of single entity. to supply the proper to read or validate to public isn't needed here.

II. LITERATURE REVIEW

Nikita Rajeshkumar Bagrecha, Ishaq Mustafa Polishwala, Pragya Abhai Mehrotra, Rishabh Sharma, Dr. B.S.Thakare [1] To giving these functionalities in a very distributed industry using blockchain, which is able to be at par with the present methodologies. This helps in reducing the transaction fee and time, which is critical in traditional banking systems. Also, as this technology is under development, there is multiple advancement within the future.

Natalia A. Popova, Natalia G. Butakova [2] To analyzes the protection mechanisms of distributed databases, proposes an answer to the matter of maintaining the individuality of knowledge in them supported Blockchain technology without tokens and provides recommendations on the introduction of Blockchain technology into modern banking industry the aim of the work is that the analysis and development of recommendations for the protection of knowledge in geographically-distributed structures, typical of contemporary banks, supported the Blockchain technology.

D.Sharma[3] o work out the platform, the initial point of this research is an analysis of how the technology operates and functions then the benefit for business and economic transaction are analysed and afterwards the research deals with an impression of latest technology on banking, particularly on financial functions. The hypothesis is that blockchain has achieved a good impact on banking sector, also it's the potential to thoroughly modify only the financial and banking sector but also the way we buy and sell our interaction with the authorities as how of authenti- cating the holding from the authorship. Using the available data and hypothesis of data from the fields of technology, economics, finance, and politics, 4 scenarios were founded for the longer term of basic technology. The scenario combined with analysis so as to prove the starting hypothesis with high reliability, authenticated and accuracy. Banking progressively detect the ability of this technology to use the advantages of the Fourth industrial revolution. The research conclusion shows that the technology being checked already includes a deep impact on the banking sector, that it's within the starting phase of modifying many industries, with the chance that they'll change them automatically within the next five to 10 years.

Priya D. Dozier, Troy A. Montgomery [4] It explores the technology evaluation process concurrently as decision makers reacted to the potential uses, as against a retrospective view after a technology innovation had been adopted. Evidence suggests that, organizations applied a selected process to work out the worth of blockchain that consisted of understand, organize, and test, which collectively helped create the proof-of-value model. Surprisingly, they find that financial service organizations tend to look at blockchain innovation as a lower priority thanks to the shortage of a transparent path to value. Additionally, financial service organizations consistently leverage industry consortiums to link to external knowledge and help with the decision-making process. Our findings have direct implications to both innovation researchers furthermore as practitionersseeking to guage blockchain technology.

Ye Guo , Chen Liang[5]Present the problems of implementing blockchain in financial sectors. It illustrates how a number of the present major banking organizations are exploring regarding the identical. because it has been already stated that Blockchain may be a truly decentralized system but under many scenarios a security of certain extent is required especially while managing money. Thus, they need compared Public Blockchains, Consortium Blockchains and personal Blockchains. They propose numerous financial institutions which may create a consortium blockchain which is that the promising model within the industry. they need also proposed how industrial standards can be implemented using this technology

Liu Songyue, He Shangyang [6] They focuses on building an irreversible distributed national economy supported large data within the context of huge data so as to use the scenario of "Block Chain Technology + Accounting Services" to the accounting industry, and prospects the applying of Block Chain Storage Technology and Intelligent Internet of Things technology supported large data, providing inspiration for future research

Satoshi Nakamoto [7] proposes a system for electronic transaction among consumers without wishing on trust. Here the cryptocurrency is made by a framework of digital signatures which provides ownership and prevents the matter of double spending. Also, a peer-to-peer network using Proof of labor (POW) is proposed to enable this method. Hence it's a strong and secure distributed system. This paper proposes a basic idea of using Hash values and Timestamp server so on maintain the integrity of the cryptocurrency and therefore the transactions by broadcasting a brand new creation of block or a brand new transaction among all the nodes present within the network.

TongWu and Xiubo Liang[8] They illustrates that blockchain is implemented for registration and documentation of varied tangible and intangible goods like belongings rights, pictures, proof of property, vote statistics, smart contracts etc. As all of them require a transparent and open information source. the main focus of the paper is about distributed databases where whether or not one or several nodes fail the transaction stored on the opposite nodes aren't affected and therefore the failed nodes can make a copy the data from the opposite nodes present within the network. They also illustrate that smart contracts basically put a collection of contract terms into agreement among untrusted parties. It also initiates an answer to use blockchain to beat traditional interbank payment issues by creating private blockchain networks thus such transactions are less vulnerable to risk and are longer efficient.

Supriya Thakur Aras, Vrushali Kulkarni [9]explains the concept of non-tokenized schema, blockchain taxonomy and hybrid solutions to become permissioned blockchain from permission less blockchain. Proof of labor (POW) protocol enables all the nodes within the network to resolve a cryptographic puzzle by brute force and therefore the winning node is rewarded with some revenue which is then broadcasted within the network. Proof of Stake (POS) protocol is largely block verification by miners using ethereum and altcoins which doesn't depend on excessive computations

Ibrar Ahmed, Shilpi , Mohammad Amjad[10] Provides the evolution of blockchain technology from Merkle tree to produce a secure history of information exchange. It explains the concept of asymmetric cryptography among nodes of a distributed network. This paper portrays a basic blockchain architecture that's the sequence of blocks and therefore the inter-relation between them using the hash of the parent block. It also provides an architecture of the block where the block is split into a block header and therefore the transactional details.

III. METHODOLOGY.

1. Authentication

2. Application for banking to handle the transaction

3. Decentralized application

4. Hashing Signature Verification

IV. WORKING

Blockchain technology has provided the foremost popular product, i.e. Bitcoin which could be a sort of cryptocurrency and functions as a public ledger for all transactions happening on the network. it's resolved the matter of double spending, unauthorized spending, and thus increasing security. It also helps to get rid of the necessity for an intermediary expert. Since there has been a considerable increase within the number of cyber attacks recently, the Blockchain technology help to draw in the various audience. Blockchain technology includes a great future worldwide. a fantastic scope of Blockchain technology has been observed within the financial field. The financial organizations weren't able to sufficiently handle the heavy workload after demonetization and thus brought out the issues of getting a centralized specialist for handling the financial transactions.
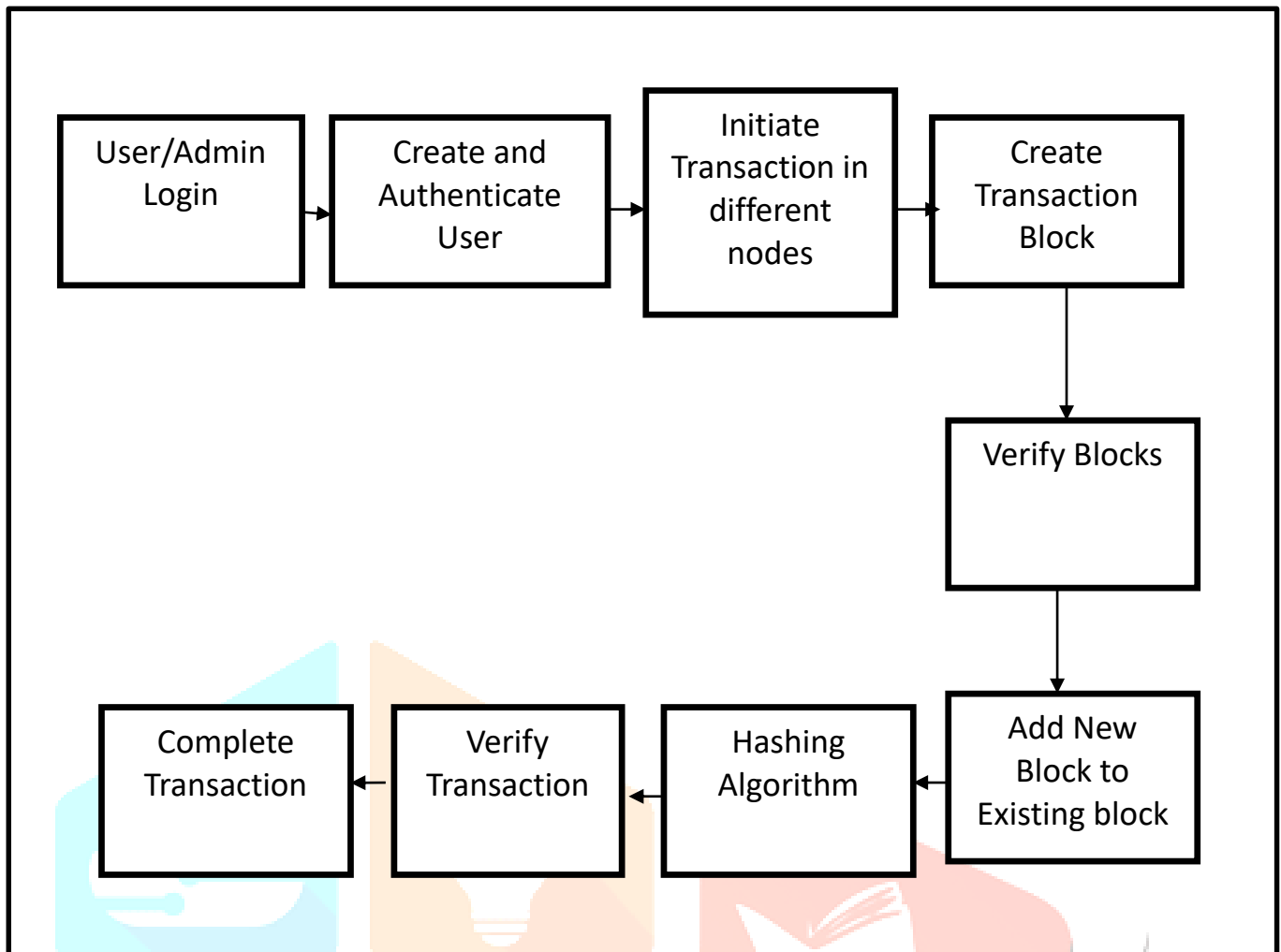
Fig: Block Diagram

Following is the working process of the system that is developed in this study:

1. A Blockchain may be a computerized concept for storing data. for each transaction on a blockchain, first it must undergo several key steps.

2. For a transaction within the blockchain, and authentication is required, when user request the transaction then a block with the knowledge of the transaction is formed.

3. Then the newly created block is shipped to each node or to each participant in a very blockchain.

4. This nodes validate the transaction using signature based hashing algorithm.

5. If the information of the newly created node is wrong or altered, then it will not match with other blocks of the nodes in the blockchain. Then the validation will fail, and the transaction will not be recorded.

6. If the information of the newly created node is match with other blocks of nodes in the blockchain or validation is passed, then the transaction is complete.

7. And the updates will be distributed to all the nodes in that particular blockchain network. And the block is appended to the existing of blockchain. For the Proof of Work, the nodes receive a reward, usually in cryptocurrency.
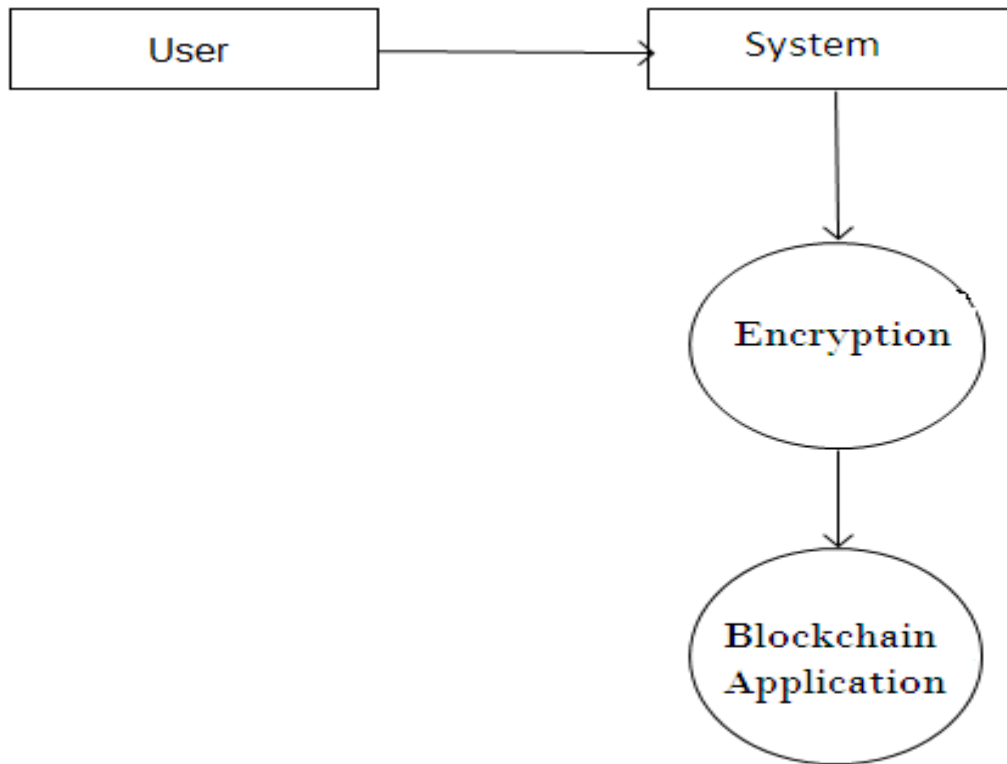
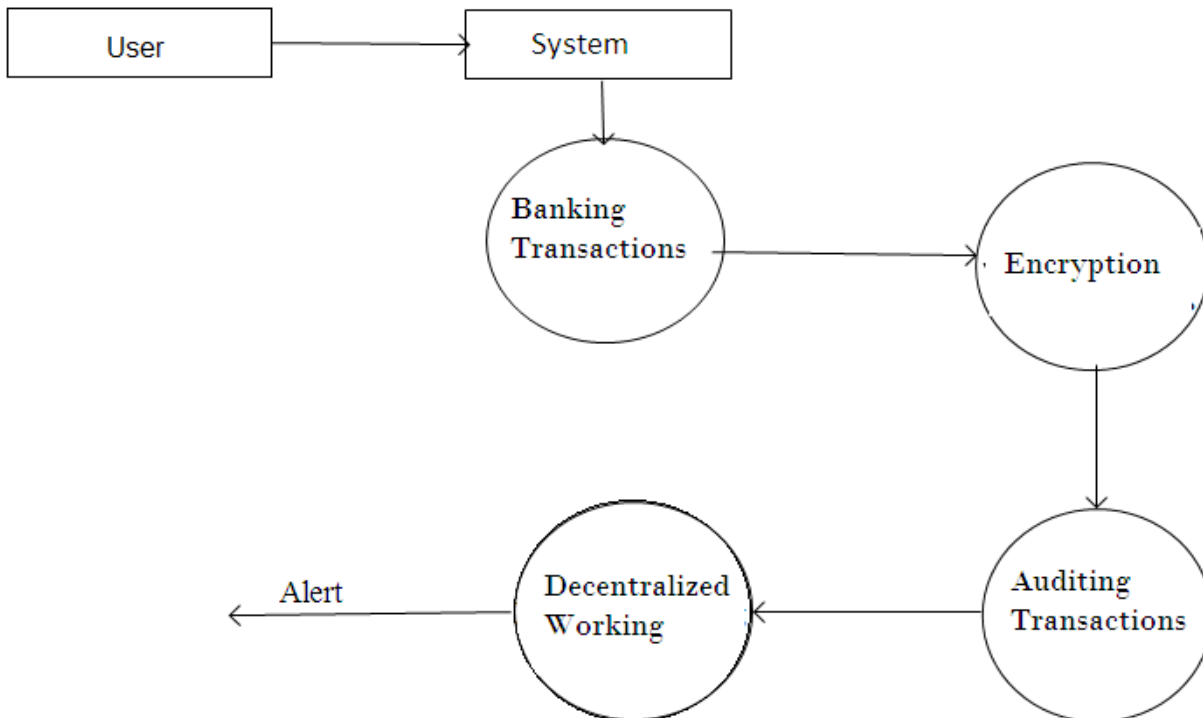## V. DATA FLOW DIAGRAM

Figure: DFD - 0 Diagram

Figure: DFD - 1 Diagram

VI. CONCLUSION

It is concluded that Blockchain is a decentralized ledger used to securely exchange digital currency, perform deals and transactions, each member of the network has access to the latest copy of encrypted ledger so that they can validate a new transaction and it can help the banks to track and identify all activities in a banking system and provides greater transparency and security, also helps in reducing the transaction fee and time, which is significant in traditional banking systems in banking sectors. Finally, the blockchain will minimize the challenges of banking systems.

REFERENCES

[1]N.R. Bagrecha1., R. Sharma etal.,"Decentralised Blockchain Technology: Application in Banking Sector", International Conference for Emerging Technology (INCET),2020.

[2] P.P. Niturkar., P.A. Kulat etal., "Block chain technology for protecting the banking transaction without using tokens", Proceedings of the Second International Conference on Inventive Research in Computing Applications (ICIRCA) PP- 978-7281,2020.

[3]Liu Songyue., He Shangyang., "Aplication of block chaining technology in finance and accounting field", International Conference on Intelligent Transportation, Big Data & Smart City (ICITBS) PP- 978-1-7281, 2019.

[4]Divya Sharma,"Application of block chain in an indian Banking Sector", www.globalscientificjournal.com, Vol-8, PP-2320-9186, 2020.

[5]P.D. Dozier., T.A. Montgomery., "Banking on Blockchain: An Evaluation of Innovation Decision Making" IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT, PP-0018-9391, 2019

[6] V. Naik, R. Singh etal., "Expeditious banking using Blockchain Technology", IEEE International Conference on Computational Intelligence for Smart Power System and Sustainable Energy (CISPSSE) ,2020.

[7]F. Essaf., S. Sakho., "Improving Banking Transactions Using Blockchain Technology", IEEE 5th International Conference on Computer and Communications, 2019.

[8]N.R. Bagrecha1., R. Sharma., "Decentralised Blockchain Technology: Application in Banking Sector ", International Conference for Emerging Technology.2020.

[9]Ye Guo and Chen Liang ." Blockchain application and outlook in the banking industry", Springer Open, 2016.

[10]S.Thakur., V.Kulkarni., "Blockchain and its Application-A Detailed Survey", IJCA, 2017.

[11]H. Wang., H-N. Dai etal.," Blockchain-based data privacy management with Nudge theory in open banking", Future Generation Computer Systems,2019.

[12]J. Wang., Q. Wu., "Research on the Blockchain-Based Privacy Protection for Internet Financial Product Recommendation System", International Conference on Computer Science and Management Technology (ICCSMT),2020.

[13]T.A. Abduljabbar., X. Zhou etal., "A Survey of Privacy Solutions using Blockchain for Recommender Systems: Current Status, Classification and Open Issues", Computational Intelligence, Machine Learning and Data Analytic The Computer Journal, Vol. 00 No. 00, 2021.

[14]Xiaoyan chen., Jiangling Ge etal., "a Data Management Method Based on Blockchain Technology", International Conference on Smart BlockChain ,2020.

[15]Shiping Chen., Yang Xiang etal., "BBM: A Blockchain-Based Model for Open BankimgVia Self-Sovereign Identity", Springer Nature Switzerland AG, PP.61-75,2020

[16]Guo., Ye,Liang., Chen etal., "Blockchain application and outlook in the banking industry" , Financial Innovation, Vol. 2, Iss. 24, pp. 1-12,2016.

[17]Rui Zhang., Rui Xue,etal., "Security and Privacy on Blockchain" ACM Computing Surveys ,Vol-1, No-1, 2019.