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Blockchain Technology and Cryptocurrencies A Survey Report

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ABSTRACT

Blockchain is a well-known distributed and decentralized digital ledger comprising of smart contracts which ensures secured transactions unlike traditional log maintenance approaches. Blockchain is a widely used applications in technology such as internet of things and pii using highly sophisticated initiatives like cryptography algorithms in a systematic manner. As blockchain is one of the most popular platforms which has transformed many of traditional technologies and provides more convenient approaches. It becomes necessary to evaluate security and privacy issues associated with it. The incorrect predictions may affect economically and socially. Traditional technologies in wall centralised management that leads to several cyber challenges eventually the blockchain platform has become more trustworthy because of it uses dedication connection between the communicating parties in terms of transaction as well as for end-to-end operation completion without the intervention of any third party. This paper can template the challenges and various aspects associated with security and privacy under this highly sophisticated platform while dealing with various cryptocurrencies.

Introduction

Blockchain technology is considered as one of the most trending technology over the past few years. The theory is acquired by Satoshi Nakamoto's 2008 bitcoin cryptocurrency. In bitcoin system, mining process and validation almost takes 7 to 8 minutes and is applicable in number of fields like health care, industry, iot, etc. Nowadays digital communication is much preferred over the traditional communication system so privacy and security has become one of the major concerns. The issue of security is resolved in blockchain technology. A database of every transaction is ready and maintained when once the block is completed another new block is generated in which it will be referenced to the first block. The unification and uniformity of data is maintained at each block. If the block is

committed once, it will not be possible to undo the process again. Thus, blockchain provides an efficient and secure way to store the records between communicating parties in a correct manner. Blockchain has become essential in many of problems such as double spending, unauthorised disclosure of private transactions, trustworthiness of the centralised computing. Credit card companies such as visa or Mastercard have implemented a minor change in the transaction value which is approximately 3% as fee for providing their privileges and the scenario is same with e wallet players in existence with cryptocurrency users. It is the prime accountability for the sales only. Consequently, the requirement of something arises where these extra expenses could be removed incurred by medical ensuring the consistency reliability and security and to safeguard transactions. There are methods to acquire cryptocurrencies: - Firstly, as an individual one can go through the centralized exchanges which usually charge 0.05-5% charges. The charges are according to the transaction and jurisdiction. Secondly, cryptocurrencies can be purchased through Institutions also and for this also depending upon the amount of transaction and jurisdiction centralized exchanges can be better for high liquidity a lower fee. Alternatively, one can go for data mining, which means lending your device for dealing with transaction to some crypto exchange and earning cryptocurrencies as a reward, airdrops or many more. In this case coins are randomly distributed to wallets and cryptocurrencies can be earned in small quantities.

Blockchain and iot: Blockchain technology is mostly implemented to solve most of the issues of security in internet of things. Apart from security issues it also helps to locate number of connected devices and cooperation among different devices that helping in managing expenses of iot industry. Due to its decentralized feature, it makes data more secured. A smart contract is established among devices which helps to maintain low cost.

Decentralization helps to eradicate many-to-one traffic flows. It also helps in providing usage of resources of all participating nodes. Blockchain technology provides secure network over communicating parties.

Objective of the Study

1. To study the impact of blockchain investments in cryptocurrencies in different age groups with their perceptions.
2. To study the impact of blockchain investments in cryptocurrencies in different areas-Rural or Urban.

Research Methodology

The research is based on Primary as well secondary data

For Primary data a survey was conducted and data was collected from 44 respondents. The scale of questionnaire was Likert scale

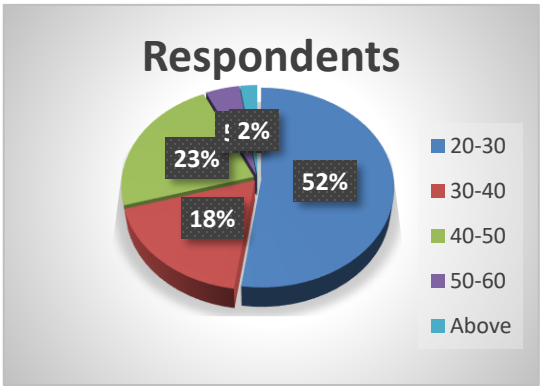
Null Hypothesis: There is no significant difference between variables

Alternate Hypothesis: There is significant difference between the variables.

Objective I

To study the impact of blockchain investments in cryptocurrencies in different age groups with their perceptions

Age Group	Responses
20-30	23
30-40	8
40-50	10
50-60	2
Above	1



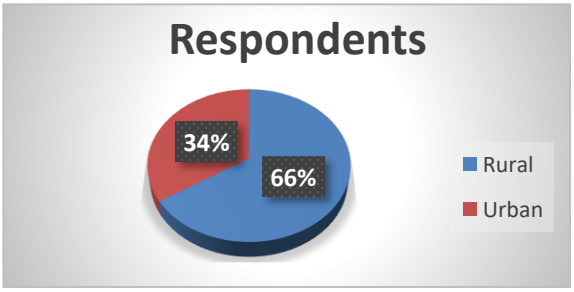
Out of the total 44 respondents chosen randomly 52% respondents are found in the age group of 20-30 which shows youngsters are more attracted toward the blockchain based investments though even there is no regulatory framework for it.

Objective II

To study the impact of blockchain investments in cryptocurrencies in different areas-Rural or Urban.

Out of 44 respondents chosen randomly 66% were from rural area and 34% have responded from urban area.

Area	Respondents
Rural	29
Urban	15



On the basis of responses received from respondents. The results are evidently proven as follows.

1. A blockchain technology is a tamper-evident, shared digital ledger that records transactions in a public or private peer-to-peer network.

Scale	Responses
Agree	32
Disagree	0
Strongly Agree	9
Strongly disagree	2
Can't Say	1
Chi-Square value χ^2	2.72E-09 2.72*10^-9
P-value	0.00

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. It can be rightly stated that cryptocurrencies based on blockchain technology shares a peer-to-peer network the transactions are represented on distributed ledgers.

1. The blockchain is a single source of truth, and members in a blockchain network can view only those transactions that are relevant to them.

Scale	Responses
Agree	29
Disagree	1
Strongly Agree	12
Strongly disagree	0
Can't Say	2
Chi-Square value χ^2	6.73744E-10 6.73*10^-10
P-value	0.00

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. All the affirmed and approved exchange blocks are connected and anchored from the start of the chain to the most current square, thus the name blockchain. The blockchain in this manner goes about as a solitary wellspring of truth, and individuals in a blockchain organization can see just those exchanges that are applicable to them.

2. Transactions are trusted, accountable and transparent.

Scale	Responses
Agree	29
Disagree	0

Strongly Agree	14
Strongly disagree	1
Can't Say	0
Chi-Square value χ^2	2.42415E-10 2.42*10^-10
P-value	0.00

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. Blockchain transactions are trusted, it can be made accountable and with every new transaction at new entry it is transparent source also.

3. There is immutable blockchain ledger for transactional applications

Scale	Responses
Agree	28
Disagree	2
Strongly Agree	9
Strongly disagree	1
Can't Say	4
Chi-Square value χ^2	7.62129E-08 7.62*10^-8
P-value	0.00

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. Changelessness can be characterized as the capacity of a blockchain record to stay unaltered, for a blockchain to stay unaltered and permanent. This usefulness of blockchain innovation guarantees that nobody can meddle in the framework or modify the information saved to the square

4. A blockchain network comprises a set of factors, each of whom holds an identical copy of the ledger

Scale	Responses
Agree	23
Disagree	5
Strongly Agree	6
Strongly disagree	1
Can't Say	9
Chi-Square value χ^2	0.000101195
P-value	0.00

The result is not significant and there is no significance difference between variables. In blockchain, one record is conveyed and kept up with across the organization. Each PC in the organization approves the exchanges, however nobody has authority over the organization, dissimilar to various clients working in a unified worker. An exchange should happen and ought to be checked by an organization of

PCs.

5. Decentralization and immutability provide a blockchain ledger with significantly increased transparency, trust, and resilience compared to a centrally managed ledger

Scale	Responses
Agree	32
Disagree	1
Strongly Agree	9
Strongly disagree	2
Can't Say	0
Chi-Square value χ^2	1.01194E-08 1.01*10^-8
P-value	0.00

In blockchain, decentralization refers to the transfer of control and decision-making The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. From a centralized entity (individual, organization, or group thereof) to a distributed network, the decentralised, transparent, verifiable nature of the system means we can trust people and organisations precisely because trust is no longer an issue. The integrity of the system, of every participant, and of every transaction is underpinned by the network as a whole. Trust, like the information, has been distributed and secured.

6. By having a provable, consistent way of describing transactions, participants can track assets across complex business networks, irrefutably determining their provenance.

Scale	Responses
Agree	33
Disagree	2
Strongly Agree	5
Strongly disagree	0
Can't Say	4
Chi-Square value χ^2	1.25486E-08 1.25*10^-8
P-value	0.00

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. A blockchain record is frequently portrayed as decentralized on the grounds that it is duplicated across many organization members, every one of whom team up in its upkeep. We'll see that decentralization and joint effort are incredible traits that reflect the manner in which organizations trade labour and products in reality.

7. It is easy for the users in a business network can use a distributed ledger to determine the mutually agreed state of a shared asset, rather than requiring different IT systems to be reconciled with each other.

Scale	Responses
Agree	26
Disagree	4
Strongly Agree	5
Strongly disagree	1
Can't Say	5
Chi-Square value χ^2	1.46868E-05 1.46*10^-5
P-value	0.00

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. Disseminated records utilize free PCs (alluded to as hubs) to record, share and synchronize exchanges in their particular electronic records (rather than keeping information brought together as in a customary record). Blockchain coordinates information into blocks, which are binded together in an add just mode.

8. A business network that is built on blockchain doesn't have single points of trust or single points of failure.

Scale	Responses
Agree	22
Disagree	7
Strongly Agree	5
Strongly disagree	5
Can't Say	5
Chi-Square value χ^2	0.016309172
P-value	0.00

The result is not significant and there is no significance difference between variables. Blockchain is something other than a value-based information base for basic information. Whenever information is submitted onto a blockchain, it's lasting and almost difficult to control or hack. Whenever exchanges are remembered for the blockchain, they can't be changed. A client needing to add information to the blockchain should make another exchange.

9. The feature of being highly volatile leads to insecurity.

Scale	Responses
Agree	23
Disagree	7
Strongly Agree	8
Strongly disagree	3
Can't Say	3
Chi-Square value χ^2	0.001039363
P-value	0.00

The result is not significant and there is no significance difference between variables. Instalment processors, shrewd agreements and blockchain instalment

stages. These outsider blockchain sellers frequently have nearly feeble security all alone applications and sites, which can leave the entryway open to hacking. Since it is a vital component of internet contributing, digital currency and network safety, knowledge of blockchain is turning into an essential for those seeking after cutting edge vocations in IT security.

Scale	Responses
Agree	23
Disagree	2
Strongly Agree	5
Strongly disagree	0
Can't Say	4
Chi-Square value $\chi 2$	1.25486E-08 1.25*10^-8
P-value	0.00

10. Governance approaches must be taken into account in the factor and that both "on-chain" and "off-chain" governance are expected to be assessed.

The value is greater than .05 therefore the result is not significant and there is no significance difference between variables. Most blockchain projects utilize one of the three presently most normal agreement calculations: Proof of Work (PoW), Proof of Stake (PoS) or Delegated Proof of Stake (DPoS). This load of components targets guaranteeing that all members discard indistinguishable duplicates of the disseminated data set records.

11. The future of blockchain technology is defined by our economic, legal, and political systems.

Scale	Responses
Agree	23
Disagree	7
Strongly Agree	11
Strongly disagree	2
Can't Say	1
Chi-Square value $\chi 2$	0.000137588
P-value	0.00

Though cryptocurrencies are gaining market uptake but still it quite possible to mention here that these currencies and blockchain technology requires regulatory framework and network compromise.

Therefore, the null hypothesis is rejected and there is no significant difference between two variables.

Benefits of combining iot with power of blockchain:

1. Build trusting in iot data: each transaction is maintained, stored in block and secured with unchangeable data chain.
2. Publicity: all participants can see all the records. The information of an individual is kept secure by private keys so even all can view it but it still its free

from attack. Iot is a high-powered system in all connected nodes which share their records and meanwhile data is secured.

3. Decentralization: it requires a greater number of contributors to validate the transaction and put into log maintenance. It does not either involved any special regulations nor any third party. It needs faith of number of members to validate data. Thus, blockchain provides secure platform for iot devices and resolving issues of single point of failure and centralised traffic flows.

4. Flexibility: each node has duplicate of log that consists of all transactions performed in network. Blockchain will be able to resist attack. The duplication of data in iot will provide efficiency in sharing records.

5. Security: it provides protected links over intermediators.

6. Low expense: looking at present scenario of iot involves high cost in foundation and operating cost. The cost would further increase when number of users also increases.

7. Changeless: it involves fix log maintenance. Any updating can only be done if the vast number of nodes approve the transaction. Hence security and privacy are increased due to this facility of data being unable to change or remove comfortably.

Problem using blockchain with iot:

Although there are number of features that is acquired through blockchain model however there are some issues that are mentioned below:

1. **Scalability issues:** it is relatable to capacity of log maintenance database which might usually increase with the time that would need data management which will predict the blockchain technology.

2. **Processing power and time:** the needed cryptographic algorithms should be implemented in the whole iot system which are combination of number of devices that have their own efficiencies.

3. **Storage will be hurdle:** although the problem of centralisation is removed due to log maintenance approach. The log record will increase with time however that has to be stored on nodes themselves which might prove to be difficult for sensors to improve as they have limited amount of storage capacity.

4. **Requirement of experts:** as blockchain technology is currently introduced people need to be much more aware about the concept and technique in different fields. People are lacking in integrating blockchain with iot devices.

5. **Laws and agreements:** it is one of the fresh topics considered that allows to living people from different regions of world without an agreement which is major concern. It provides obstruction to integrate with any other models.

Applications:

Due to number of features of blockchain technology it will be used in different field. Below are some of the different fields depicting the usage of the technology in different domains:

1. **Healthcare:** Every department of health like doctors, patients, medicines etc need to be updated with recent technologies for providing best facilities. Nowadays

patients don't like to disclose their suffering to any outsider. To overcome this problem of privacy patients can prefer to use blockchain technology. It can be as a website or and mobile application. This system involves two keys, public and private through which transactions are done. For example, we need to share data from node a to node b this will be possible when node a sign digital signature using private key, private key will act as a secure connection, further data will be hashed using public key and an address is produced. The node b will confirm it and then only the transaction is performed.

2. **Electronic medical records:** Blockchain facility provides a feature to the patient to manage your medical record patients are upset about the privacy of the medical records all these issues can be resolved it will be managing validations, hiding and responsibility of data it will work with the centralised approach.
3. **Protect personal data:** Today there is a increase in problems with personal data because of the involvement of mediator. Blockchain eliminates the mediator and helps in personal communication. Nowadays social media has become one of the prominent sources of risk to personal data. The minor parties try to change, attack or misuse data which results in number of unwanted happenings. Blockchain makes user the managers of their own data which helps to create smart contract.
4. **Legal perspective:** Blocking is implemented in the digital era. It involves bitcoin, smart contract, ledger. Bitcoin is invented by programmer named Vitalik Buterin to send value over internet which is managed electrically. It will keep full history of transaction and help to remove issues like tracking, validation. The value of bitcoin increases with passage of time. Smart contract is computer program first proposed by Nixck Szabo in 1994 which controls digital currency. It also works on decentralised approach which saves time and effort. Ledger is also decentralized application assigned to each user in blockchain. A record of transaction is maintained once transaction is performed. For example, Mary and Mercy are two persons, Mary will give 1000 rupees to Mercy there is John in this blockchain they will have different ledger. This data will be updated automatically in every ledger. Mary said to give 100 rupees to Mercy then there is voting mechanism which will help to validate if Mary is not accepted.
5. **E- business:** People nowadays are very much fond of online shopping. With passage of time there is increase in interest of e business model. Studying the previous research model, it involves transaction of smart property and paid data on iot with the help of node-to-node trade based on blockchain and smart contract.
6. **Intelligent transportation system:** This system involves 7 layers. Each layer provides one or the other facility to increase the security of system and privacy of record. This system involves various vehicles that is connected in peer-to-peer model. Different algorithms are used to check if a data is valid or not.

Three game changing attribute:

1. Security

2. Accountability
3. Efficiency

These provides features to remove the issues that have made problem in building faith among mankind over past few years. Examining each feature is relevant blockchain allowing effective chances and predicting exceptions:

1.Security:

We are in digital era where every work is related to digitalization. We need not to be in our homes to do any work. Internet has provided with a number of features like data management, banking, purchasing, education etc. The life has been made better with time where it becomes necessary to secure records and keep them safe. It is the basis of blockchain technology the combination of its different features like data verification, cryptography and distributed architecture have made faith in people.

Features:

1. Public keys used in cryptography techniques to associate with communicating parties, further need to confirm their recognition through private keys to communicate. Public keys provide legacy of blockchain users and keeps data safe from attackers.
2. If there is some alteration in record it would not be validated which will stop the transaction to complete further, thus safeguarding it from hackers.

3.Duplicacy of data is maintained over network. Due to any reason one point is inaccessible the whole system would not fail to work.

Social impact:

People do not know how the data is being used by different organisations. However, through blockchain technology., people can control their own personal data. Government prohibits to communicate by blocking access to fewer website but blockchain allows its user to access within their network if it does not cause any threat.

Challenges:

1. Due to higher fault tolerance user need to wait for response until a transaction is added verified and recorded in blockchain. This states more the data is secured more time will be taken to respond.
2. Public is not fully participating in digitalisation because of its various threats.

2. Accountability:

It is estimated worldwide that there is decline of responsibility in organisation. Regions of the world were not able to eradicate corruption. This all led to violent and disruptive upcoming. However, blockchain technology can maintain better relations through different methods.

Features:

1.Anyone with device will be able to see the data of public blockchain.

2.Public keys helps to know with whom we are on block chain.

3.Immutable and reduce the likelihood of inaccurate or outdated data and preserve the integrity of blockchain. Social impact:

Blockchain captures hard data finding out who, where and when the problem is being created with content. Data traceability provides implementation tools to find the responsible ones. Blockchain would allow to cross check the originality of

medicine which will reduce diseases.
Challenges:
Once the attackers have their private key, everything can be stolen with ease thus leading to severe mis happenings.

3. Efficiency:

the government efficiency has been constant or decreasing in recent times. Due to invalid data us loses dollar 3 trillion every single year. Features:
Due to decentralization the request would be put to closest node rather than at central point. As demand on data foundation is more uniformly content is distributed which will increase network bandwidth and serves user faster.
Social impact:
It helps to remove traditional manual maintenance of records. It allowed to work more effectively for employees as well as families to develop and raise the living standard. Challenges:
If poor data is added to blockchain it will be difficult to correct and that would lead to fault in blockchain architecture. Many of the issues of 21st century can be resolved using blockchain technology.

Conclusion:

It is widely evident from the survey that these currencies are doing best from past 12 years and will be a best performing asset in next 10 years but still in India it is in nascent stage. It has provided explanation about the features of blockchain technology. It is a peer-to-peer model with decentralization feature. It has public digital ledger. Blockchain can be used in various applications without the intervention of other communicating parties. The recent ones in trend are also being identified. The technology has numerous advantages however still some research is to be done. Privacy and security issues need to be found out and accordingly the steps should be taken that would help in future upliftment. If the combination of technology is preferred over single technology that would provide greater is there should be techniques that its application as well. It will provide more security while transaction occurs. It provides cost effective transactions as compared to other applications. It provides extra benefits in transparency and unchangeability. Although with its growth and development blockchain is becoming well known application. As the base of this technology is secure many applications that required security will ship to this technology. There are still some problems hu solutions need to be found out.

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Annexure:
Link of questionnaire
https://docs.google.com/forms/d/1ePcjR_3hwjBXrW4jXq9u9-5fpHWhJyB4mfc3rf6z6-I/edit#responses