Blockchain Technology in India – Prospects and Challenges

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Abstract: A blockchain is a decentralized, distributed and public digital ledger that is used to record transactions across many computers so as to have zero fault tolerance. so. In 2009, Santoshi Nakamoto used this concept to structure a crypto money currency bitcoin. In India initiative to implement a blockchain technology is taken by, among other states, the state of Andhra Pradesh in order to ensure digital security and to see how we can use blockchain in different areas or sectors. Blockchain has the potential to be used in many areas including healthcare, education, public safety, agriculture, civil registration, defense, consortium banking, payments and KYC. Blockchain structures are made up of two main components. First one is distributed ledger and second is state replication. One of the key advantages of utilizing square chain innovation is that the information is decentralized which diminishes the dangers from digital adventures. The Blockchain technology forms the backbone of the digital e-government in Estonia and is used to ensure the validity of the data. The Blockchain Technology is set to revolutionize networks of the future into self-regulating decentralized networks which will be a major paradigm shift in the way we transact. The absence of a typical blockchain stage and application standard, is a amongst the most important reason why the underlying speculation of time and cash to build up a government blockchain stage is so high.

Keywords: Blockchain, Government, Digital, Security, Implementation

I. Introduction

Blockchain, generally known as the spine innovation behind Bitcoin, is one of the developing advancements as of now in the market drawing in part of considerations from ventures, new companies and media. Blockchain can possibly change various businesses and make forms progressively popularity based, secure, straightforward, and proficient. With high volumes of information getting produced each day attributable to digitization of records, it ends up imperative for each association to viably deal with the security dangers and accomplish noteworthy cost efficiencies. This is the place Blockchain, with its guarantees of decentralized proprietorship, permanence and cryptographic security of information, is grabbing the eye of the C-suite officials. Various use cases are likewise getting investigated crosswise over businesses as everybody has begun understanding the problematic capability of this innovation. Money related players are the principal movers to exploit this innovation even though it is still in a beginning stage. An examination by the World Economic Forum predicts banks and controllers around the globe are ready to try various Blockchain models in 2017. With 90+ national banks occupied with Blockchain discourse all around, 2500+ licenses documented throughout the most recent three years and 80% of the banks anticipated to start Blockchain and disseminated record innovation (DLT) extends by 2017, the Blockchain innovation is on its course to turn into the new ordinary in the realm of money related administrations. Numerous organizations, from a plenty of nonfinancial administrations enterprises like telecom Cyber Security, Supply Chain Management, Forecasting, Insurance Industry, Private transport and Ride Sharing, Cloud Storage, Crowd Funding, Voting, Governance, Energy Management, Retail, Real domain are end route to build up the potential Blockchain use cases to decidedly upset their conventional plans of action or effectively actualized their pilot Blockchain use cases (Shah & Jani, 2018).
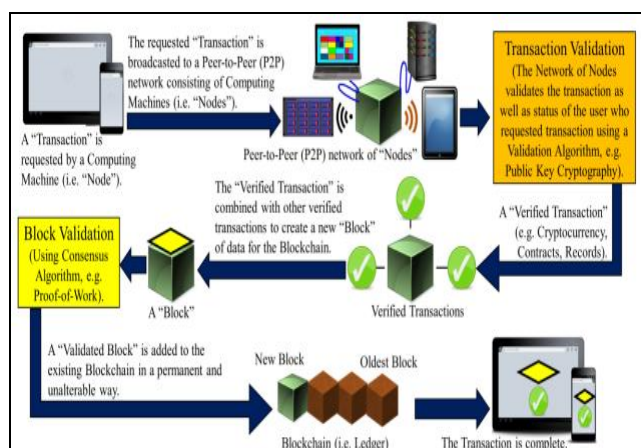
II. Blockchain

A. What is Blockchain?

The blockchain is a succession of squares, which holds a total rundown of exchange records like customary open record. Each square indicates the quickly past square by means of a reference that is basically a hash estimation of the past square called parent square. It is important that uncle squares (offspring of the square's precursors) hashes would likewise be put away in Ethereum blockchain. The main square of a blockchain is called beginning square which has no parent square (Kibet & Karume, 2018).

A blockchain is a chain of obstructs that contains information. This methodology was initially characterized in 1991 by a group of analysts and was initially intended to timestamp advanced archive with the goal that it's impractical to antedate them practically like a recorder. At that point it was acknowledged by

Satoshi Nakamoto in 2009 to structure Crypto money bitcoin. Blockchain is innovation that capacities bitcoin which was its unique reason. Blockchain innovation is imperative these days since it can do as such considerably more, it is shorthand for an entire suite of disseminated record advances that can be register or ascertain to record and track anything of significant worth from money related exchange medium records and even land understanding. At present, the utilization of blockchain innovation has been proceeded to the IOT, clever assembling, store network organization, advanced resource understanding, and different fields in various regions. Blockchain offers government a brisk and quick, shielded from assaults, dynamic, clear factor of having the capacity to grow government help and communicate with their kin. Eastern European governments have for the most part driven the route on blockchain acknowledgment, which has been looking at the innovation since 2008 in Estonia, from 2012; it has utilized blockchain in numerous structures like vaults in legal frameworks, the social insurance framework, security and law-making body. Presently in India we are discussing blockchain that how it could assist us with creating increasingly more use and it could be helpful of blockchain in open areas. In India the state Andhra Pradesh has formed into the main state to begin the blockchain innovation in two organizations and the arrangement to grow it over the other organization and office. The Chief Minister of Andhra Pradesh in Blockchain Business Conference (BBC) where he said that the state had likewise assemble the greatest documents of utilized cases for worldwide new companies to test their outcomes, since the legislature in this state is prompting e administration, were it was utilizing blockchain innovation to stop digital security issue. The state expressed with the undertakings for land records and travel the board. Andhra Pradesh state IT Minister additionally said that the innovation was expected to abstain from tricking/altering of land understandings, which had just been set on the web and digitalized. Essentially, in Transport Division the innovation is utilized to dole out numbers for the vehicles. He additionally included that Andhra Pradesh is doing administrations for 60% of Aadhaar based exercises and comprehensively utilizes innovation for dispersion of administrations and the state is in need to embrace blockchain to ensure the IT resources (Navadkar, et al., 2018).


Overview of Blockchain (Puthal, et al., 2018).

B. Working of Blockchain
Blockchain structures are now encompassed of two main gears.
1. The main segment is distributed system. This is the component by which the numerous PCs deal with the database and impart new changes to that database which are called exchanges.
2. Second significant segment of blockchain frameworks are simply the database and this database stores the total history of exchange and the request in which those exchange happens.

A P2P organize is a companion arrange made of hubs which are PCs and this PC basically associates with one another pretty much indiscriminately and this enables us to have a decentralized system. In P2P organize when another message shows up it will be sent to any of them to begin with and afterward every hub sends the message to the majority of its neighbors in the system and each neighbor does likewise so in all respects rapidly you will have messages that engender through the whole system and this is the means by which messages get shared on P2P arrange.
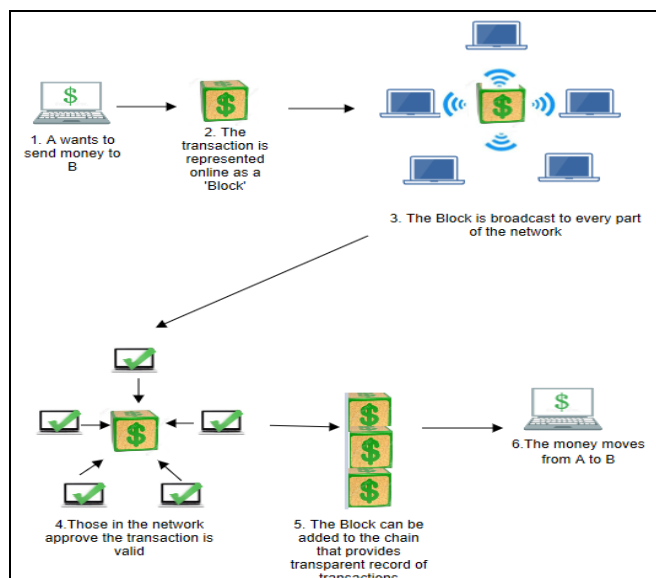
Working of Blockchain (Shekhar, 2018).

Blockchain is simply the database now a blockchain database is developed by history of exchanges which are alterations to the database so what's toward the start of history is called beginning of square which is fundamentally an unfilled state which everybody can concur on because it is so straightforward. Presently toward the starting we have beginning free and everybody concedes to it at that point individuals start submitting exchanges to enable adjustments to that state, so someone makes an exchange and communicated through the system again because of the P2P innovation. We start to make square of exchange now when another square is added to the system it bunches exchange together, it builds up an agreement of the request in which the exchange happened and after that a cryptographic mark is added as far as possible of the square. Above all else signature sets up a connection to the past square now in the principal hinder this is a connection to beginning state in all consequent square. It will be connection to the square that continued. At the point when new hub shows up in the P2P system and associates with a portion of different hubs which have been in the system before fill that new hub ever of database so they send it to every one of the hinders that new hub can replay the history exchange and arrive at same resolution with regards to the present condition of database has every other hub in the system so's the means by which blockchain tech works (Navadkar, et al., 2018).

III. Application of blockchain in public sector

To improve efficiency and decrease errors in delivery of service to public, blockchain technology is used. For instance, blockchain help to businessman and citizens in owning intellectual property like houses, research patent, vehicle or registry on authorized assets of government. One of the major uses of blockchain can be seen during the elections which gives assurance that one-person casts one vote only. In public sector, it is used as back end office tool to update purchase and coordinate other functions among different departments. It also helps in preventing errors and fraud while increasing productivity and efficiency to achieve desired profit. Bitcoin is an example of blockchain only where bitcoin is controlled by the blockchain technology. Currently research on blockchain has been going on with the motive to extend this concept beyond cryptocurrency. Popular applications of cryptocurrency are Ripple, Ethereum and Grid coin etc, and future applications can be possible in domains like voting, online identity provisioning and trading commodities. Various surveys are conducted to know how one can invest in blockchain. Hence, blockchain is used in almost every sector like finance, reputation management, healthcare and supply chain management (Navadkar, et al., 2018).

C. Healthcare

The most important change in health sector organizations are digitalization which helps to record all the information of patients, but it also has disadvantage of complexity when it comes to centralization of the same. Here, blockchain can help in securing the records and can improve flexibility in exchanging these electronic health records (EHRs). With the help of blockchain technology fraud practitioners can be removed from the industry as it can keep record of all medical certificates & licenses and can create easy availability of sources for blood, organs, drugs etc. in case of emergency. (Navadkar, et al., 2018).

D. Education

Blockchain helps in storing sensitive information in secured way and moreover it also saves time to find records of any students or faculty. The most important information needs to be recorded are transcripts, certificates, student details, faculty details etc as reliability of every detail is the main concern. This information is safe and protected even if there is failure of server. Blockchain also helps in easy verification of credentials of degrees or certificates. Forging of degrees can be prevented through this technology. (Navadkar, et al., 2018).

E. Public safety

Blockchain technology solves various problems of coordination among agencies and ensuring public safety by providing cooperative truth based on the situation. Blockchain establishes source of custody for proof which is important evidence state (Navadkar, et al., 2018).

F. Agriculture

In agriculture industry blockchain helps in reducing cost and difficulties faced by farmers to supply their produces to the final consumers as it improves supply chain transparency. It also helps in recording agricultural land details and managing insurance of agriculture produces (Navadkar, et al., 2018).

G. Civil registration

Blockchain can create platform for registration of civilians by recording important events like birth dates, death dates or marriage ceremony dates. This process can ease the process of recording citizen information which is totally confidential, and no one can access it. This provides various advantages to stakeholders (Navadkar, et al., 2018).

H. Defence

Information which is most important for the country is also significant to national security system like defense. Blockchain technology helps in evading unauthorized access to this information and avoid any alteration of the information. The advantage of this technology is that it provides access for data alteration only if there is consent given and access through different resources like different networks, data centers etc. (Navadkar, et al., 2018).

I. Example (Odometer Tampering)

If car manufacturers create some software or system to record car mileage in computer system, there is always a possibility that this mechanism can be discovered by others as well. This is because software usually uses encryption & decryption of data for storing information and whole process is available on same computer, so it can be easily manipulated. And as a result, mileage information will be altered. Blockchain provides security against any type risk related to manipulation or tempering of the information.

In the current scenario of the world, every person relates to each other with the help of internet and this is beneficial for us in a way that we can write and beneficial for car buyers as well that it can store information of mileage in a database which is decentralized and secured. The vehicle information can be fetched easily when required by providing identification code to each vehicle. At the end of the week, entry will be done by providing specific date and time and with the help of chip or connector which is attached to the vehicle helps in data transfer to database which is decentralized, and mileage can be checked with the help of app. At the time of selling, Buyer can check the last entry. And at the time of buying vehicle mileage will be around the entry recorded in the database. Hacking the database will become difficult as it requires highly technical skills as well high finances (Navadkar, et al., 2018).

In the current situation, inappropriate methods have been adopted to get work done, For example,
1) Everyone is expecting manufacturers of car to solve this technical issue of manipulating or changing mileage which is usually done by service providers or dealers
2) People thinks that centralized way of information recording is the best solution to this problem of hacking with the intention of manipulating data. The technology of

blockchain can solve this problem by recording data in decentralized manner and record all the information related to mileage with all the protection so that no one can manipulate the information which has been already recorded. With the help of blockchain technology, data will be recorded at the end of the week in the database. This process will protect data against any type of manipulation and with the help of internet, information reach across number of manufacturers is easy and high (Navadkar, et al., 2018).

Fig -2: Application of Blockchain Technology
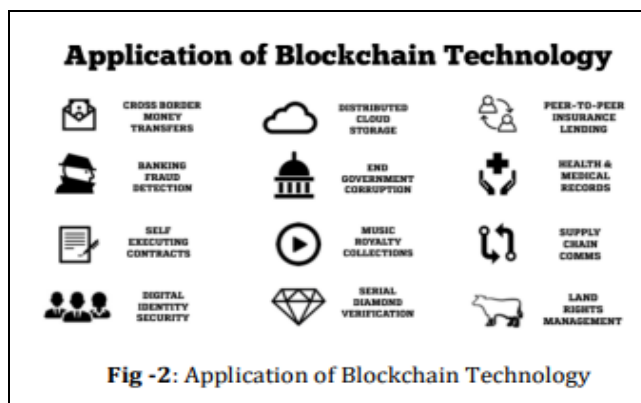
(Navadkar, et al., 2018)

J. *Consortium Banking*

Huge amount of financing required by the corporation which undertakes various development projects related to roads, trains, airport, factories etc. In this case institutes should form a group to lend money so that risk can be diversified among different members equally. This will help in reducing the burden on only one party. Members can do verification process one by one in rotation. To increase flexibility and flow of credit, RBI has withdrawn various regulations related to conduct of consortium, multiple banking in October 1996. But as per recent fraud cases related to consortium arrangements, Indian Government has expressed their concern and said that they will work on baking system processes related to multiple banking arrangements and consortium lending. According to commission, fraud incidences are result of ineffective sharing of credit history information and borrowers account among different banks (Jani & Shah, 2018).

K. *Payments*

To improve banking system of India, electronic payment system has been introduced and successfully implemented in banking sector. Mostly payments in India has been done by transactions which are paper-based but adoption of e-payments is also rapidly growing. Banks are growing fast with the introduction of e-payments. According to current payment process services, movement of money is problematic. Though Know your customer process has been introduced but still it is difficult to link account with the name of person or company. However, there is possibility that "beneficial ownership" make it simple in United States. In some countries, there are regulations related to privacy of customers which prevents bank to reveal any information about their customers to anyone (Jani & Shah, 2018).

L. *KYC*

Processes of KYC are very expensive as they are inconsistent and repetitive. Documents collected for KYC processes are generally:
1. Internally recorded and stored with the help of internal database or document management system
2. Sent to external third-party agency which helps in the verification process of an individual and check the validation of documents submitted by an individual
3. After verification and validation process banks update these documents in internal repository

Private entities like SWIFT, banking consortium and government authorities' initiatives results in increased registries of KYC. These registries record all the details regarding KYC process, acting as centralized repositories and on the other hand central registry records digitized information linked to customer's unique identification number. It is mandatory for banks and financial institutes to do KYC process of every individual and upload all the accurate information to central registry. Banks can access this information with the help unique identification number provided to everyone on the request of customer for new service within same or another bank (Jani & Shah, 2018).

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KYC – using Blockchain Technology
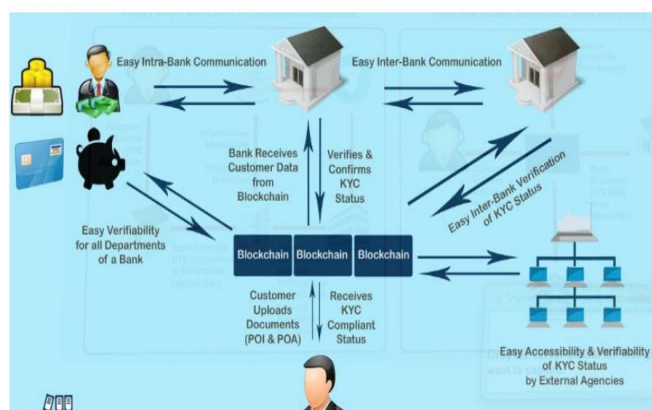
(Jani & Shah, 2018)

IV. Difficulties To Implement Blockchain Technology In Public Sector

The distinctive techniques regarding financial interest in science and innovation may speak to not just an administration's frame of mind towards innovation and advancements (and perhaps towards another type of open organization), yet in addition different parts of the district's unique circumstance, for example, monetary plenitude and mechanical assets. The foundation of a blockchain stage includes various distinctive frameworks and associations, and issues, for example, time and cost will impede its development. Blockchain innovation has as of late been utilized for applications past digital currency. While it has many energizing potentials uses, it doesn't ensure unwavering quality of data and would have a few restrictions as a long-haul answer for safeguarding reliable advanced records. The subject of where and how to store the records related with the blockchain stage is an issue that must be tackled if the blockchain framework is connected. The records of open administrations stages are significant proof of legislative, monetary, and social exercises, and in this manner they ought to be exchanged to the files and properly kept up for long haul protection. If such records can't be saved suitably, social liberties, legitimate proof and social memory could be harmed hopelessly. At present, the greatest dread really comes not from framework presentation, yet the visually impaired trust in the blockchain with respect to blockchain engineers, administrators, law requirement and the overall population. This trust depends only on the innovation, instead of the executives, to ensure the framework is trusted and the records in the framework are solid. It can't be ensured that innovation will never commit an error, notwithstanding. What's more, if the blockchain stage was generally utilized in e-government for frameworks that contain fundamental data, one mix-up may prompt genuine results. The blockchain stage requires the participation of numerous organizations. Step by step instructions to guarantee the entire procedure will be recorded and kept up suitably and figuring out which organization should assume liability to deal with the framework and its records is an inquiry that ought to be replied before setting up the framework (Navadkar, et al., 2018).

V. Solutions To Implement Blockchain Technology In Public Sector

The absence of a typical blockchain stage and application standard is a standout amongst the most imperative reasons why the underlying speculation of time and cash to build up a government blockchain stage is so high. Illuminating the essential ideas, procedures, and guidelines in the use of blockchain innovation in e-government can improve the consciousness of blockchain innovation, bring together the fundamental create stage and application programming interface, advance the interoperability of numerous blockchain frameworks and immaculate the business forms required. This will decrease costs and improve consumer loyalty. Innovation foundations need to consider not just the work engaged with creating blockchain stages, yet in addition the work required for their long-haul task. This implies preceding building up blockchain stages, administration foundations, innovation associations, chronicles and other included organizations ought to take part in dialogs about both start-up and support, with each applying their expert learning of various regions to make the framework and the executive's strategy helpful and solid. The administration framework stays basic in fruitful execution. The legislature is at last in charge of the administration of the blockchain stage for open administrations. Since this framework incorporates different associations, it is important to elucidate the duties of each taking part association, the start to finish forms. Security and protection are the primary properties of a decentralized exchange condition. The center objective of records the executives is to ensure records can be trusted. The security arrangement of a blockchain stage ought to incorporate physical security, information security, application frameworks security, mystery key security and hazard the board. Building a safe

framework can amplify security of the typical tasks and ensure the reliability of records inside the stage (Navadkar, et al., 2018).

VI. Issues Related With Blockchain

Each innovation will have its own constraints and issues/issues. Blockchain is said to be overhyped by a portion of the faultfinders. Maybe a couple of the issues are clarified in short here:

- Multifaceted nature Blockchain has totally new arrangement of vocabulary. It has received cryptography as the real player and this progression to be sure is making blockchain a mind-boggling innovation (Meva, 2018).
- System measure Blockchain like other appropriated innovation is antifragile - reacting to assaults and becoming more grounded (Meva, 2018). Blockchain has substantial number of clients. On the off chance that blockchain isn't supporting a powerful system with across the board framework of hubs, getting full advantages will be unthinkable.
- Exchange cost and system speed by taking case of Bitcoin, in late 2016, it was conceivable to process seven exchanges for every second. The expense of every exchange was about $0.20, and it had the capacity to store 80 bytes of information. Additionally, it requires adding subtlety to every single hub of the system and performing hash figuring's, so it vigorously utilizes arrange speed (Meva, 2018).
- Human mistake for considering blockchain as database, it requires to have amazing data as an info. The data going to be put away on blockchain may not be reliable, so every occasion ought to be recorded precisely. Generally, the expression 'Rubbish in – Garbage out' will be valid (Meva, 2018).
- Governmental issues Blockchain give a chance to digitizing governance models. Diggers are framing another sort of boosted e-administration demonstrate. Along these lines, there are opportunities to have open differences among various areas of network. It is striking element and clears connection with 'forking' a blockchain. This sort of discourse will be plainly specialized and at times, will be warmed however extremely instructive for the individuals who are keen on blending of majority rule government and accord (Meva, 2018).
- Interoperability Blockchain systems have been isolated into classifications like private, open and consortium. Each of these has its own points of interest and weaknesses dependent on application necessity. One blockchain may not be enough as there is anything but a solitary arrangement which fits for all classifications of issues. Agreement system will differ starting with one industry then onto the next. Different angles like security, centralization and economy will likewise shift starting with one then onto the next business. The blockchains of various types can't speak with one another at this stage. To take care of this issue, you need different cross-chain innovations for interconnection (Meva, 2018).
- Information flexibility is a dormant issue in the Blockchain innovation. The marks don't give surety about the responsibility for Bitcoin moved in an exchange. An aggressor can adjust it and afterward rebroadcast an exchange which can make issues with exchange affirmation (Meva, 2018).
- Verification -An issue identified with the Blockchain exchanges is the confirmation. A case of occasion with the validation is the known case in Mt. Go when the capacity of client private keys was assaulted and stolen (Meva, 2018).
- Squandered assets the vitality spent of mining in the Bitcoin arrange was $15 million every day according to information in 2015. The loss in the Bitcoin is a result of the Proof-of-Work exertion. Here, the likelihood of mining a square will rely upon the work done by the digger (Meva, 2018).
- Ease of use- Here ease of use is an issue claiming Bitcoin API is less user-friendly in examination of the other most recent APIs (Meva, 2018).

VII.   Challenges Related With Blockchain

Although blockchain has given solid help to oversee security, still blockchain innovation is confronting difficulties. A portion of the difficulties have been depicted here:

a. Scalabilty

There is an expansion in blockchain use volume and ascend in the quantity of exchanges happening regular routine, blockchain has turned out to be gigantic in size. Exchanges are put away in hubs for getting approval. To start with, the present exchange source should be approved before exchanging itself. The square size confinement and time break required to create new square assumes a noteworthy job in not fulfilling prerequisite for the concurrent preparing of many exchanges continuously condition. In few cases, size of square may likewise make issue in postponement of exchange (Meva, 2018).

b. Protection spillage

Principle helplessness of blockchain is spillage of exchange security claiming the parities and subtleties of open keys will be noticeable to every single one accessible on system. One recommended arrangement is to get obscurity in blockchain. This can be grouped in mysterious arrangement and blending arrangement (Meva, 2018).

c. Edgotistical mining

It is a noteworthy test in blockchains. A square is helpless of conning regardless of whether a little piece of hashing power is utilized. Here, the digger keeps with him the mined square with no communicating on system and will make a private branch which will be communicated after meeting certain necessities. Because of this, genuine diggers will sit around idly, and assets and private chain will be mined by narrow minded excavators (Meva, 2018).

d. Individual Identifiable Information (PII)

The legend identified with blockchain and character is that blockchain gives perfect appropriated elective rather than incorporated database stockpiling for Personal Identifiable Information. Blockchain can in fact bolster putting Personal Identifiable Information on chain or used to make authentication on the chain which focuses to off-chain for Personal Identifiable Information stockpiling. Elmagharaby and Losavio talked about Personal Identifiable Information from the perspective of correspondence and area protection (Meva, 2018).

e. Security

Security alludes to the terms like respectability, accessibility and privacy. As all knows, classification will be low in circulated systems, just as respectability is likewise a noteworthy concern. For this situation, accessibility will be not an issue as replication is there. Another real concern is 51% larger part assault. For this situation, one digger can deal with the chain. Likewise, there will be difficulties like anticipation from DDoS assault, Trojans and infections from adware and so forth. (Meva, 2018).

f. Fork Issues

It relates to decentralized hub adaptation, just as understandings when the product update. This is extremely vital as it includes a wide range in blockchain. There are essentially two sorts of forks – hard fork and delicate fork. At the point when frameworks accompany new understanding or form, and if it isn't perfect with more seasoned adaptation, at that point the more seasoned hubs can't be concur with mining of new hubs. What's more, this makes one chain in to two. This is called hard fork. At the point when frameworks accompany new understanding or form, and on the off chance that it isn't good with more seasoned rendition, at that point the new hubs can't be concur with mining of more established hubs. More established hubs and new hubs keep on taking a shot at a similar chain. This is called delicate fork. Delicate fork makes the more established hubs unconscious about accord rule changes. Additionally, it won't influence steadiness and viability as the two sorts of hubs are on single chain (Meva, 2018).

g. Time affirmation

Bitcoin exchange takes just a single hour in examination of conventional exchange which takes right around 2 to 3 days for affirmation. Still it is more contrasted with the desire. Lighting system can be the answer for this (Meva, 2018).

h. Guideline issues

The real test in the event of blockchain execution is guidelines and guidelines of different nations. The idea of decentralized structure will make the control of national bank (Meva, 2018).

SOME KEY CHAIN ADVANTAGES OF IMPLEMENTATION OF BLOCKCHAIN TO INDIAN ECONOMY
1. Reducing transaction cost and streamlining the complex trade finance procedures
2. Increased exchange speed making it continuous exchange notwithstanding for cross outskirt, evacuation of centre man and withstanding to precise mapping at each stage
3. Overall advantage for the whole biological community

VIII.   Blockchain Role In Financial And Banking Sector

An investigation led by World Economic gathering proposes that banks and monetary controllers will undoubtedly test numerous aces to kinds of square chain in 2017-18. Indeed, even the non-money related parts like human services, telecom, life sciences, and telecom and friendliness areas are likewise intently checking the advancement in square chain with the sole reason for moving to computerized models and proceeding onward from the conventional plans of action that are as of now being utilized. Innovation and banking is a coalition

which has benefitted every last one and returns a long while. Effects on banking are especially imperative, with advances, for example, continuous settlement capacity, lessening counterparty chance and upgraded mechanization. Square chain grasps the capability of conveying more noteworthy productivity and straightforwardness to the financial business, for instance, permitting cross-fringe exchanges to be set aside a few minutes and cash to be traded at the speed with which data moves today. "Banks ought to take a lead in this supposing that you take a gander at the first motivation behind setting up a bank, it was to associate networks together and encourage exchange and business. Out of the blue, you have an apparatus to do only that on a worldwide scale which is secure and undeniable," Gautam Jain, worldwide head of digitization and customer access at Standard Chartered Bank. It has colossal open door in changing the manners in which exchanges are conveyed cross fringe and job of banks and budgetary foundation in them. It's an extraordinary communitarian device when individuals can cooperate with more prominent straightforwardness. The main purpose behind it postpone usage is absence of clear information and comprehension among little monetary foundation about advantages and utilization of square chain (Gaur, 2018).

Few of the current phases towards implementation of Blockchain in India:
1. IT administrations industry body NASSCOM has marked a MoU with Block chain Research Institute (BRI) to create and support the rising square chain eco framework in India (Gaur, 2018).
2. Niti Aayog is right now dealing with an aggressive undertaking called India Chain to build up an across the country square chain. They are wanting to test it in instructive area by issuing advanced authentications in pilot stage to understudies of IIT Bombay and Delhi in the year 2019 (Gaur, 2018).
3. In October 2016, ICICI bank declared about its effective trial of a pilot exchange by means of its square chain coordinate with Emirates (Gaur, 2018).
4. Axis Bank and Kotak Bank are starting pilot test on cross outskirt exchanges utilizing square chain (Gaur, 2018).
5. Corporates like Mahindra and Mahindra have guaranteed of testing square chain innovation in provider to producer exchange money exchange (Gaur, 2018).

Regardless of whether it is an interbank instalment including the two banks and focal office; or an exchange account exchange including two gatherings alongside their individual banks; computerized exchange and archive based procedure have significant task to carry out in money related division. All the while requests for continuous exchange, with abnormal state of precision, information security have over and over made them to think of inventive procedures with more proficiency and dependability. Still there are cases every now and then which have risk to the framework. This is the place square chain can help or may fill in as a preventive advance for following such cheats and handle the above difficulties. Taking a gander at protection area we realize the weight confronted uniquely in vehicle and harvest protections operators who need to endorse recommendations in huge numbers and convert them into approaches. Along these lines; influencing the nature of check and confirmation which is undermined to comply with up the time constraints. Job of square chain can fundamentally help and guarantee accuracy at each phase for basic instalments and confirmations. It can likewise avert twofold protection of same resource with different organizations. AI can help guarantee that the procedure of assessment revises itself all alone as it accumulates data and leads an ever-increasing number of confirmations. Once assessed, the character or FICO assessments can be put away and shared crosswise over various organizations and establishments which can be recovered OnDemand utilizing private blockchains by just checked individuals with the assistance of shrewd contracts. Likewise, scores can be refreshed and reflected continuously by all partners. The two principle grapples for India are Ripple and Stellar ho are utilizing the blockchain in India's financial division and endeavoring to address the cross-fringe instalment issue with various methodologies. Swell is at present working with consortium of banks that utilization its innovation to shape a 'worldwide instalments guiding gathering' to exploit the system impacts. It incorporates the absolute greatest banks far and wide, including Bank of America, and Standard Chartered, Mitsubishi, Barclays, Santander. Hub Bank and Yes Bank are the main Indian banks that are a piece of it. Outstanding, then again, is an open-source stage that can be embraced by any association. As of late, IBM chose to cooperate with Stellar to build up an answer tending to the issue. In this clash of cross-outskirt instalments, the officeholder SWIFT is yet the Goliath. It is difficult to topple a perceived association, for example, SWIFT, which has a huge preferred standpoint with its 11,000 accomplices. As of late, in any case, even SWIFT has chosen to test the blockchain innovation. As a feature of its worldwide instalments advancement (GPI) activity to modernize the cross-outskirt instalments framework, it has tried some confirmation of-ideas to 11 supplement its present structure. While these are the set up blockchain systems, Indian banks have taken a strange yet praised course of framing its very own consortium 'bank chain' on a different blockchain stage. Declared in February 2017 by SBI, the system has developed to 24 individuals, including universal banks, with the point of investigating, fabricating and actualizing blockchain arrangements in the financial segment. It presently has 10 dynamic activities in

progress, for example, shared KYC, syndication of credits, virtual monetary forms and 12 cross-outskirt instalments. While it is an energizing activity with splendid prospects, it will intrigue check whether they grasp or battle the universal partners who profit by a more extensive worldwide system and have just begun picking up footing in India. Similarly, as with any new innovation, there are a few challenges to embracing the blockchain. Indeed, even with every one of its advantages, the innovation carries with it the infamous notoriety of cryptographic forms of money (the regular name for computerized monetary forms). Since its beginning, Bitcoin (the greatest digital money) has been related with illicit exercises, for example, tranquilize dealing and coercion, because of its possession namelessness. Albeit, as of late, trades have been compelled to actualize KYC (Know Your Customer) and AML (Anti-Money Laundering) standards, the namelessness perspective remains (Gaur, 2018).

IX. ROAD AHEAD

The innovation is accepted to progressively proficient and increasingly secure. One of the key advantages of utilizing square chain innovation is that the information is decentralized which diminishes the dangers from digital adventures. A portion of the prominent cryptographic forms of money that utilization square chain innovation are bitcoin and ether. The test with square chain innovation is that it's costly and requires top of the line assets to process the information. It's fundamentally claiming in a square chain organize every hub plays out indistinguishable undertakings from each other hub all alone duplicate of the information. Top banks in India are progressively perceiving the gigantic capability of blockchain. Some of them, for example, ICICI Bank, YES Bank, Kotak Mahindra Bank, and Axis Bank, have utilized it for seller financing and global exchange money. Others are in various dimensions of talks to comprehend the innovation and its potential employments. Most of them are relied upon to embrace blockchain in some piece of their organizations in the following three to five years. As indicated by a PwC report, 56% of the players in the monetary administrations segment try to draw in with blockchain in some structure and in the long run make it a piece of their center business, contrasted and 77% comprehensively. The Reserve Bank of India's exploration arm Institute for Development and Research in Banking Technology (IDRBT) takes note of that "time is ready" for the appropriation of the innovation in India, referring to the sound premise fundamental the innovation, its numerous favorable circumstances, and the assortment of its applications. In an ongoing declaration, RBI educated that they will give a model blockchain stage to support selection inside the business. Blockchain can enable the money related segment to move far from its overwhelming dependence on money-based exchanges. "From a mechanical point of view, we feel that blockchain innovation has sufficiently developed and there is adequate mindfulness among the partners which makes this a proper time for starting appropriate endeavours towards digitizing the Indian Rupee through blockchain innovation," says an IDRBT white paper on the uses of blockchain innovation to the banking and money related area in India. Some blockchain commentators, notwithstanding, question whether the innovation is prepared for across the board selection and whether it really offers benefits that can't be accomplished utilizing progressively customary methods. It is additionally hazy, some state, how the budgetary administrations industry would move from the present administrative routine to a semi self-sufficient setup that exploits blockchain. Different issues incorporate the requirement for updates, while tending to versatility, administrative and security concerns. The IDRBT report finishes up the advantages of the innovation far exceed potential concerns, which it inspects cautiously in its report. While guarantee of blockchain innovation is incredible, it is still in its beginning stages. All things considered, it has risen as a vital innovation, fit for changing the scene of worldwide money, and the monetary segment needs to jump aboard. As an establishing individual from the open-source Linux Foundation Hyper record venture, and a driver of worldwide blockchain cooperation and advancement, IBM is attempting to reconsider business organizes crosswise over different enterprises. By and by, IBM enables organizations to help fabricate, run, and oversee creation prepared square chains at scale and crosswise over businesses including FMCG, money related administrations, coordination's, shipping, and mechanical (Gaur, 2018).

X. Blockchain Implications For Tax

General review: The administration's point of view Blockchain can disturb and emphatically revamp bookkeeping and the way charge instalments are handled. As the innovation is still in its outset, acquainting Blockchain with the expense specialists would require an insurgency in both legislative databases and system frameworks. The successful execution of Blockchain for expenses isn't just restricted to this zone and requires thinking about each territory of legislative movement. Asides from coordinating IT frameworks on numerous dimensions, executing Blockchain would likewise require extensive changes to the legitimate framework, improving laws on databases, licensed innovation and lawful personality. Be that as it may, the advantages of Blockchain innovation on a legislative dimension are difficult to disregard. Over the long haul, Blockchain can be a driving variable in executing continuous, computerized charge forms for both little and expansive endeavors. Finance charge in most of created nations, matters identified with finance are for the most part

digitalized. In any case, the frameworks for finance charges have a critical blemish: there are numerous administration establishments included and everyone holds their very own register, accepted copying information held by different organizations. Executing a Blockchain - based to a circumstance where bosses won't have to go about as delegates, in charge of ascertaining and exchanging duty and government disability instalments from worker compensations to significant establishments (Delloite, 2017).
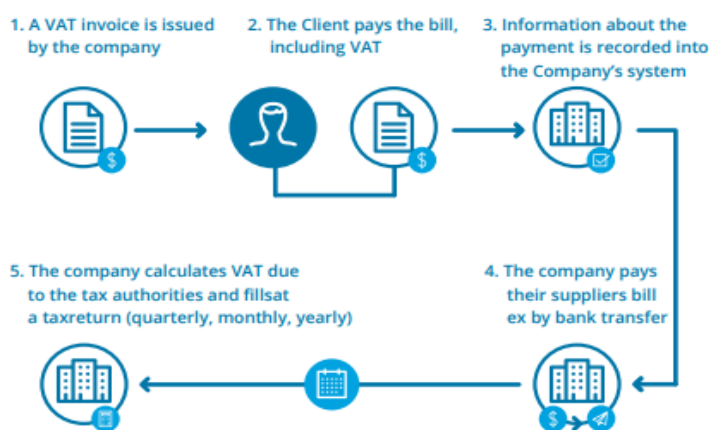
This should be possible for instance by implanting savvy gets that completely robotize the procedure, which should be possible in the accompanying advances:

- The business embeds the gross measure of pay into the framework,
- Inside the Blockchain framework (restricted just to the duty organization, banks and the other important gatherings), charge information is coordinated with the instalment by keen contract innovation and ascertains the right assessment and government managed savings sums,
- The net pay is consequently exchanged to the representative's record and the determined duty to the administration,
- Thus, the finance charge process is quicker and less exorbitant, and income is increasingly productive. Exchange Pricing According to United Nations information, intra firm exchange makes up around 30% of worldwide exchange inside and out. The laws directing exchange valuing are diverse for every nation, necessitating that cross-outskirt exchanges between related gatherings conform to a safe distance cost. Basically, this cost should reflect the proposed or connected cost between non-related gatherings in an open market (Delloite, 2017).
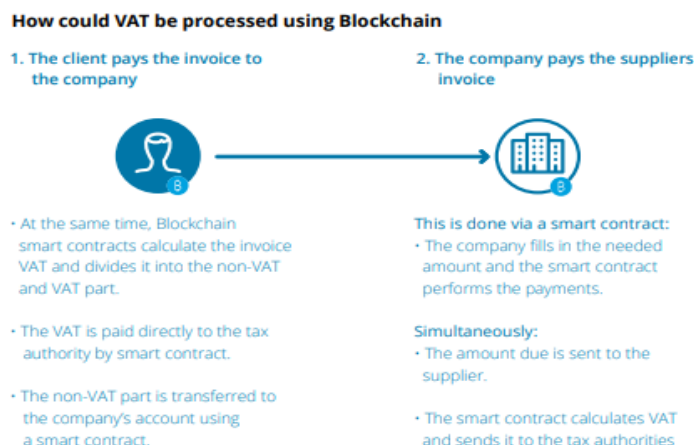
How can Blockchain benefit everyday VAT transactions?

- The managerial weight of organizations is essentially decreased, sparing time and the expense of bookkeeping administrations
- All the exchanges are led progressively,
- All the exchanges executed by shrewd contracts are sealed and straightforward,
- Reduced danger of extortion and oversights,
- Immediate knowledge into an organization's funds,
- High speed of cash exchanges among organizations and the administration,
- Taxpayers get the weight of VAT sum figuring's on receipt level and VAT sum due on expense form level removed,
- Room for VAT cheats is radically diminished claiming a similar framework taking into consideration preparing VAT from value-based perspective, permits in the meantime for multi-measurement checks and confirmations of the exchange, gatherings of the exchanges and lawful and business setting of the exchange (Delloite, 2017).

(Delloite, 2017)

How could VAT be processed using Blockchain

1. The client pays the invoice to the company

2. The company pays the suppliers invoice

· At the same time, Blockchain smart contracts calculate the invoice VAT and divides it into the non-VAT and VAT part.

· The VAT is paid directly to the tax authority by smart contract.

· The non-VAT part is transferred to the company's account using a smart contract.

This is done via a smart contract:
· The company fills in the needed amount and the smart contract performs the payments.

Simultaneously:
· The amount due is sent to the supplier.

· The smart contract calculates VAT and sends it to the tax authorities

(Delloite, 2017)

XI. Conclusion

Blockchain is a Technology that is designed to achieve minimum fault tolerance using the concept of state replication along a distributed ledger. A distributed ledger is essentially an asset database that is shared on a peer to peer network across all peers. All participants on the network have the same copy of the ledger. Any changes to the ledger are reflected in all copies in immediately. The assets can be financial, legal, physical or electronic. There are 'keys' and signatures to control access to the shared ledger.

In case of Bitcoin and Crypto-currencies, the entire technology is based on two pillars which are a) Proof of Work and b) Consensus Mechanisms. Transactions are bundled together into a block. Miners verify that transactions within each block are legitimate. To do so, the miners should solve a mathematical puzzle known as proof-of-work problem. A reward is given to the first miner who solves each blocks problem. Verified transactions are stored in the public blockchain. This process validates the transaction as well as creates new Currency. This money is given from the charge that is levied on transactions. In Ethereum that charge is called 'gas'. Distributed ledger technologies have the potential to help in a wide variety of areas.

In the second Generation of Blockchain, Proof of Work is replaced with the proof of stake. The creator of a new block is chosen in a deterministic way, depending on its wealth, also defined as stake. The are no block rewards. All the digital currencies are previously created in the beginning, and their number never changes. This means that in the Proof of Stake system there is no block reward, so, the miners take the transaction fees. In this Proof of Stake system miners are called forgers, instead.

Blockchain has the potential to revolutionize the current models of commerce, energy, finance, politics, real estate, and many more industries. There is a tremendous potential for this Technology to be used for Government. Estonia is digitally the most advanced country in the world. Most government services in Estonia are online. Right to internet is assured by the Government. The Blockchain technology forms the backbone of the digital e-government in Estonia and is used to ensure the validity of the data. You can use medical e-prescriptions, file taxes, or even buy a car online without needing to go to the vehicle registration office. Top banks in India are progressively perceiving the gigantic capability of blockchain Niti Aayog is right now dealing with an aggressive undertaking called India Chain to build up an across the country square chain. The absence of a typical blockchain stage and application standard, is a amongst the most reason why the underlying speculation of time and cash to build up a government blockchain stage is so high. Despite the challenges, we feel that the Blockchain Technology is set to revolutionize networks self-regulating decentralized networks which will be a major paradigm shift in the way we transact in India.

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