National Strategy on Blockchain: A Systematic review on its adoption and impact

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A B S T R A C T

The biggest boom of the year came after the implementation of the budget, where the present Indian government showed interest in Blockchain and Cryptocurrency, by announcing a tax of 30% on the income that came from trading of crypto. India is ready for the adoption of blockchain technology and the digital transformation that is taking place. The evolution and implementation of blockchain will pace the rate of growth of the nation and will transform the obsolete working of the sectors like e-governance, Finance, Supply Chain, Health, and educational organizations. India is focusing on developing a trusted digital platform for giving an extra edge to its growth and development. The implementation of the technology will not only help India join hands in hands with the Global Leaders but will certainly make the developers or techies come up with the best possible solutions to maintain transparency in the system. This paper will cover the overview of the adoption of Blockchain and cryptocurrencies in India and the impact it will have on the different working areas.

Keywords: Blockchain technology; Digital Transformation; Transparency; Security, Decentralized exchanges.

1. Introduction

Blockchain is a decentralized distributed ledger technology that eliminates the need for a third party for validating the transactions. The cryptographic hash algorithm is used to secure the data and the transactions stored in the blocks of the Blockchain. Using the hash function blocks are linked with each other with proper security. Each block of the blockchain contains the small print of transactions timestamp, the hash of the previous block, etc. compared to a centralized system blockchain provides higher security because it is almost not possible to tamper with the keep knowledge. Blockchain is used in permission (private) or permissionless (public) models that have its application in several domains like education, cyber security, governance, finance & banking, legal, health care sector, etc.

The Permissionless /public models don't need any permission for the participation, anyone will be a part of, read, write and commit. It's really decentralized thanks to the participation of an unknown participants. Extremely secure thanks to participation of additional variety of participants however determinateness of group action may take an extended time compared to a non-public network. Some higher agreement algorithms for this models area unit Proof of labor, BFT variants.

Permission /private model needs permission for participation, solely authorized will write and commit. It's partly decentralized thanks to the participation of noted participants. Its security relies upon the scale of the network. Determinateness of group action is higher during this model thanks to the participation of less variety of participants compared to public network. Some higher agreement algorithms for this models area unit Proof of period of time, Poxes, RAFT, Proof of Stake. Blockchain Technology permits the officers to verify the proof of the existence of any document by comparing the small print of the provided copy of the document with the first one keep within the Blockchain. The transparent group action method may well be applied in any domain victimization of this technology. In order to induce the most effective results of this technology, a proper national-level strategy is required.

Meity(Ministry of Electronic and Information Technology) has supported a multi-institutional project titled "Distributed Centre of Excellence in Blockchain Technology" with C-DAC, Fermata Jojoba Technological Institute (VJTI) Mumbai ,and Institute for Development & analysis in Banking Technology (IDRBT) Hyderabad , as capital punishment agencies. Proof of conception resolution enabled the Cloud Security Assurance, trade finance and Center grasp Your Customers (CKYC). Blockchain primarily based resolution has been developed for property registration in Telangana State at Shamshabad District. Meity has initiated a project for the planning and development of the National Blockchain Framework (NBF) to make a shared Blockchain infrastructure and supply Blockchain as a Service (BaaS).

Blockchain may be a secured suburbanised info that maintains an incessantly growing list of records/transactions. Old entries can't be deleted; new entries are visible to any or all. Mainly used for running crypto currency network and might store knowledge of various varieties. Recently PM mode presented Prada Mantra Rastriya Bal Puraskar awards – as digital certificates through Blockchain technology for the primary time in Republic of India ,and prizes price Rs one hundred thousand every earlier than the Republic Day 2022 .These got to twenty nine youngsters for "exceptional accomplishment " in many categories: Innovation(7),social service(4),scholastic(1),sports(8),art and Culture(6) and bravery(3).

Taxation on Crypto currencies, Virtual Assets: Giving clarity on taxation of crypto currencies and different virtual assets, minister Normal Sitharaman proposed a thirty per cent tax on financial gain from transactions in such assets. Also, to bring such assets below the tax internet, she planned a one per cent TDS (tax subtracted at supply) on transactions in such quality categories on top of a particular threshold .Gifts in crypto and digital assets also will be taxed, she said.

A Blockchain based system has been developed by NITI Aayog in collaboration with Gujarat Narmada Valley Fertilizers and Chemical Limited (GNFC) for fertilizer subsidy. A whitepaper has been released by IDRT describing the blueprint for the adoption of BCT in Banking and Finance in India by 3 steps:

Interbank: private Blockchain for Bank's internal purpose

Interbank: for implementation and testing of PoCs

Central bank: initiating admissible efforts for digitizing Indian Rupees through BCT.

A Future Skill Prime program has been started by the Government of India (https://futureskillsprime.in/standalonetechnology/blockchain) in order to fulfill the growing needs of talent pool by up skilling and reskilling potential employees, professionals and students.

Blockchain Technology is also actively promoted by the Government of Telangana and Government of Tamil Nadu.

2.   Literature Review

Blockchain and supply chain have heaps of potential for the technology and each technology goes through its ups and downs right therefore if we glance at it from a perspective of however technology has modified our lives. And blockchain is one such technology that has tremendous potential. We tend to square measure in an exceedingly bit of a blockchain winter currently therefore you recognize the elation of 2017-18 has died down a touch however truly what I am attending to mention is that the potential of the technology if you consider what neutral therefore users claim 100 percent of the worldwide gross domestic product are hold on blockchain. There is a blockchain within the information therefore you recognize blockchain databases can store 100 percent of world gross domestic product as per world economic forum and different sources got nerve that says that the worth added from blockchain, can you recognize accelerate to one hundred seventy {five hundred seventy five} billion by 2025 and one trillion currently. These numbers means off the mark however the purpose is you recognize we talked of that sort of potential of this business blockchain won't be a technology band-aid it'll truly replace the present method in numerous industries. One in five banks have truly enforced a blockchain pilot so there are some pilots that are there however it isn't very been a full ton most of the pilots are happening in US and China. And that is wherever Asian nation has to catch up the size of the blockchain market as per markets and markets they are a neutral marketing research firm has you recognize simply twenty three billion. These square measure terribly tiny numbers therefore it is that this necessary to adopt it as an inspiration known as exponential technologies I do not apprehend whether or not any of you truly have detected of singularity. Universally however, exponential technology are that states that a few years from now ,the expansion is nearly stagnant or zero and so you suspect that something does not have potential as a result of which you recognize ,you do not see it growing or increasing speedily. So suddenly, once there's the movement from the first adopters to the first majority you recognize it's known as crossing the gap. I mean we tend how've all browse the book that is wherever suddenly it gets into network effects and therefore the technology starts you recognize quite just about you. Recognize attending to a crucial mass so that is wherever we believe that perhaps until 2023 the market truly are in this part wherever it's actually stagnant growth early-stage innovators - early adopters and that is very tiny percentage of the market however from early adopters to early majority that's wherever the market can explode, which can happen in all probability post 2025.

Therefore most of you'd apprehend what's blockchain, therefore I simply wished to say that you just apprehend there's heaps of confusion around distributed and decentralized truly decentralized, a set of distributed systems which can be any engineering science person can tell you. However blockchain may be a distributed ledger what means is that the ledger are often operated by multiple nodes anyplace they're placed it's truly distributed computing by the nodes. It's decentralized within the sense that every node can truly decide whether or not they have the flexibility to make a block. Both these are literally having constant factor, therefore there isn't any real confusion of these terms it's distributed computing and decentralization of choices therefore what meaning primarily, blockchain may be a set of blocks explicit set of transactions creates a science hash it is a hash created by the content, any tiny digit or variety you alter which the hash changes therefore if you've got to basically tamper with something then the link to the previous block can wander away. As a result of the hash changes therefore , the technology is powerful and there square measure only a few nodes. That are literally you recognize things World Health Organization square measure, what is known as Byzantine nodes that square measure essentially malicious nodes therefore these individuals attempting to bring down the network you recognize it. Therefore as an example hacker is trying to bring down the network so he wants you to recognize one thing that isn't factual, so he essentially creates that you just know , I might say the shortage of agreement is that if you've got quite

fifty one balloting for you the block are accepted and it can be you who recognize place onto the blockchain so ensuing block will come as a backup. Once more when 10 minutes, the session expires. It is a set of transactions that associate degree element of the ledger and presuming that these are all voted for by neutral nodes wherever individuals have an incentive.

To be honest, Bitcoin was the primary implementation of blockchain and that I assume heaps folks compared blockchain with Bitcoin. {they square measure they're} 2 fully various things Bitcoin is AN application crypto currency blockchain is AN underlying infrastructure that creates processes that are economical and this is often what's quite replacement entire processes across industries and we'll come back thereto in an exceedingly whereas the agreement mechanism is you recognize earlier proof of labor therefore heaps of mining that you just hear of you recognize those who {are truly are literally} making an attempt to make the block they get paid in bitcoins therefore each and bitcoins we all know the worth you recognize I believe it's come back down a touch however as an example twenty thousand bucks currently it's perhaps seven eight thousand bucks therefore if you really crack a block you get currently I believe 1/4 of a Bitcoin therefore that is immense cash right for somebody who's you recognize sitting and cracking code and proof of labor meant that your laptop was rather more powerful that's dynamic currently and you're actually having alternate agreement mechanisms like proof of stake and proof of period. so proof of stake is that you simply apprehend I place a selected stake in terms of Pine Tree State choice as a node if I own ten pc stake that I've place in there and that I vote then I even have ten pc choice rights thus it's like associate degree virtually shareholding pattern. the chance is that if I work incorrectly and I am proved wrong I lose that stake that is why once more you're making an attempt to drill and promote honest behavior thus there's a loss that person can lose a stake that is why he won't vote for one thing that is fake or malicious. And proof of period of time. There is a mechanism known as hyper ledger serration that was originated by Intel so this is often the against agreement mechanism they're following. And eventually what you've got may be a sensible contract thus most of you'd have detected of sensible contract thus primarily all the selections within the method that area unit coded into sensible contracts. sensible contract has nothing to try to with legal contracts really it is not wrongfully reasonable that is why currently heap of lawyers are attempting to envision however they will create this wrongfully enforceable some countries like Baltic State and doubtless Switzerland. I have started exceptive these as wrongfully reasonable however not in India. Thus these area unit primarily code that permits that every of the participants will value more highly to you recognize primarily get mechanically paid if to Illustrate, they are a part of the contract is completed. thus for example if I am purported to deliver one thing and that I reasonably place that in there the sensible contract acknowledges that you simply apprehend this item has been delivered thus it mechanically releases my payment subject to the word of the neutral nodes. And what meaning is I do not got to go and chase up for payments and you recognize do the normalStuff that you simply apprehend tiny vendors have to do with huge corporations right thus it removes that part of this is often however blockchain appears like you really have a peer-to-peer network as a result of most of the transactions happens between nodes. Thus that is peer-to-peer could also be people it's going to be corporations. It does not matter they enter into transactions, the transactions that area unit loaded on and you recognize the jack World Health Organization is crack the block creates a block that is that the shortest. You recognize I'd say set of transactions that area unit coupled along which block is really a series of blocks because the block then there's an agreement mechanism.

We talked concerning proof of labor, a proof of stake that sits on high and permits the block as a result of that's seen by majority nodes because the one process the set of transactions within the absolute best method then you've got one thing such as you know state machines and everyone that that is that the Ethereum you recognize virtual machines and everyone that that permits the computation on the cloud. It's just about rife however if you cross-check the come back the countries World Health Organization have done the foremost add blockchain I'd say a great deal of East Europe countries like Baltic State and everyone have truly created this wrongfully enforceable that is conjointly wherever the innovation has are available in terms of applications right I mean that is the vital issue you recognize wherever will this apply thus it generally applies in you recognize things that area unit to try to with opposed counterfeiting you recognize like I same you recognize the protection aspects however you recognize you cannot you recognize hack the network is incredibly important and to finish traceability of provide chains thus a great deal of startups have done food traceability you recognize if you've got organic foods otherwise you have foods you recognize that area unit for a grocery store going from you recognize the country wherever it's originated to a grocery store and therefore the North American country shelves everybody needs to understand that it's truly came from wherever they assert it came from thus a great deal of organic sealed product there is one thing known as root .So root is however blockchain permits you to prove that you simply apprehend this was however this came through equally cold chains you recognize you would like to make sure that the temperature remained at intervals the zone and it did not get spoiled as a result of a part of the chain you recognize failed to adhere to the temperature limitations all this is often sealed on to the blockchain in provide chain and you'll be able to truly live all this thus IOT and blockchain may be a huge space wherever you recognize each the IOT sensing element knowledge and blockchain because the repository of that knowledge and transactions add bicycle to make sure quality of this of you recognize the merchandise and you recognize offer comfort to the client right and we have a tendency how've talked people and China are doing the most range of pilots a great deal of this is often to try to with payments in banking remittances there are use cases in food provide chain like we same and conjointly after all you recognize cross-border trade and you're either permission lists or permission right thus all the enterprise block chains that came up earlier that was with a collection of nodes wherever all the participants participated was what was known as permission personal blockchain right thus hypo Ledger's one example of that once you cross-check Bitcoin it's atomic number 2 of these reasonably ripple these are all public permission less thus there's also a variant of public blockchain that is permission so etherium for example has each the permission lists and a permission blockchain then you come to permission less and you look at you know let's say neutral nodes voting they have to be incentivized and that incentivization has to come through Bitcoin or some token where they get you know payment for voting right it's like Board of Directors if you call the directors for this you have to pay sitting fees to the Board of Directors right same way for the nodes because they are not party to the transaction .They are validating a transaction they have to be compensated and that is through a token so what you will actually find there is that financial services health care are really the places where the impact is the highest and what we are talking about blockchain and supply chain is really the second last category called transport and logistics.

3. Conclusion:

After the successful implementation of several different projects and PoCs on Blockchain has encouraged the government to work on more projects using Blockchain technology. Blockchain has helped businesses cut off the cost by removing the third party help which will enhance the trust and accountability of the working process of any transaction and also the trust among its stakeholders in the world. Blockchain's track and trace capability make it more efficient.

4. Future Work

Blockchain has been hyped due to its potential as a technology in the health sector but not much implementation is done yet. For the reasons like transparency, high security, and immutability the scope of Blockchain technology being implemented in Cyber security is obvious. Adoption of emerging new admissible technologies will create new opportunities for India in the global world. In defense, the use of Blockchain will enhance the security of the documents. It will also ensure the confidentiality of the documents. In the future, the contribution of this technology in different domains like e-governance, digital transaction, etc has a positive effect on the governing process and society.

References:

1. Blockchain: Trends and future opportunities; S Zeadally, JB Abdo - Internet Technology Letters, 2019 - Wiley Online Library
2. Bitcoin, Blockchain and FinTech: a systematic review and case study in supply chain; S Fosso Wamba, JR Kala Kamdjoug ,Planning & Control, 2020 - Taylor & Francis
3. Blockchain in Fintech: A mapping study; S Fernandez-Vazquez, R Rosillo, D De La Fuente - Sustainability, 2019 - mdpi.com
4. National strategy on blockchain : Ministry of Electronics and Information Technology ,Government of India ,December 2021
5. Blockchain Market Industry Analysis and Forecast (2019-2027)-by Provider (Application and solution ,Middleware ,Infrastructure and protocol),by Organization Size (SME and Large),by Application,by Industry Vertical and by Geography ,Report by MAXMIZE MARKET RESEARCH PVT .LTD.

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