International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 10 Oct. 2022, pp: 283-290 www.ijaem.net ISSN: 2395-5252

Supply Chain Optimizationin Blockchainof Financial Structure and Entrepreneurial Experimentation for Commercial Applications

S.Aramuthakannan[1]S.Lokesh[2*] M.Ramya Devi[3] B.Gomathi[4]

[1]*Associate Professor,Department of Mathematics, PSG Institute of Technology and Applied Research, Coimbatore -641062*

[2,4]*Associate Professor, Department of Computer Science and Engineering, PSG Institute of Technology and Applied Research, Coimbatore -641062*

[3]*Department of Computer Science and Engineering, Hindusthan College of Engineering & Technology, Coimbatore, India*

Date of Submission: 01-10-2022 Date of Acceptance: 10-10-2022

ABSTRACT: The impact of blockchain technology on financial structure expands monetary hypothesis to examine how blockchain innovation can shape advancement and challenges in computerized world. There are two distinguish key costs influenced by the innovationis proposed arethe cost of verification and cost of networking. The cost of verification identifies with the capacity to economically check the states, comprising data regardingformer exchanges as well as its properties, also present possession with a local computerized resource. The cost of networking administration that identifies with the capacity to bootstrap and work a commercial center without doling out control to a brought together mediator. This is accomplished by consolidating the capacity to economically check state with financial impetuses focused at compensating state changes that are especially important from a system point of view.This investigation on supply chain optimization in blockchain of financial structure and entrepreneurial experimentation for commercial applications exposes thesignificant steps for adopting blockchain by shapethe organization to accept fluidity and disruption across the business and economy, acceptthe management style focused on innovation,self-reliance and agility, plan with test non-hierarchical organizational models as part of work decentralization and evaluate potential blockchain use cases for the financial institution or ecosystem.

Keywords: Blockchain,digital platforms, market design, smart contracts,distributed ledgers.

I. INTRODUCTION

In the recent years the phenomena of Blockchain technology moved much more away from big coin to a little space of multiple of coins. The finance sectors walking up to the idea that can beuseful and move to thesafe technology that enhances from old to new services. The digital streaming is now come on stream every time this happens there's a note of caution right to the finance sectors to get excited and economists at good point when they put big point on the cover but actually talked about the trust machine so moved away from the idea of a currency and brought a much closer to this concept that can use a crypto currency to have a preferred audit trail and that's kind of useful and in many lines of business. Digital currency experiment which is done for the past few years has shown in Figure 1. Many finance sectors effectively showed experiments to shove forward understanding the digital currencies that could work within the country'sfinancial system.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 10 Oct. 2022, pp: 283-290 www.ijaem.net ISSN: 2395-5252

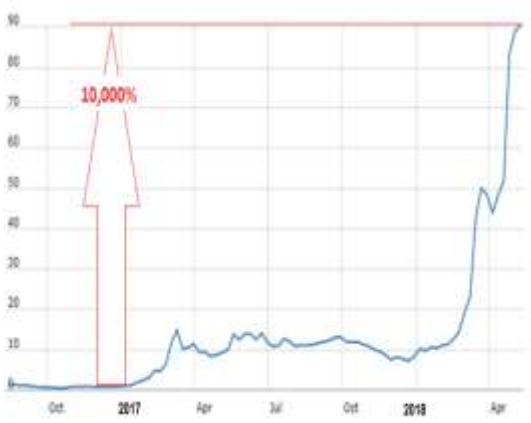

Figure 1. Digital Currency Experiment

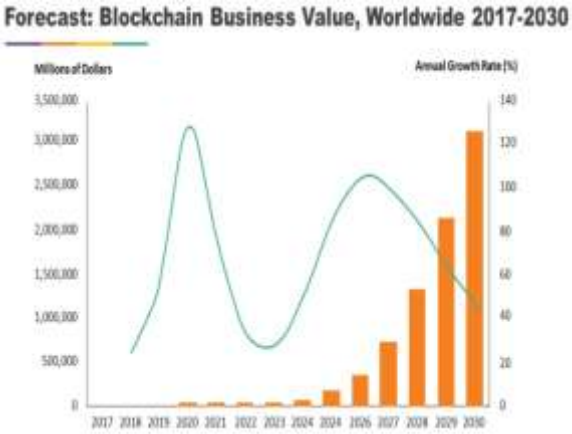

Figure 2. Emerging Business Technology Hype cycle

II. DEVELOPING TECHNOLOGY CYCLE

The finance sector trying to use Blockchain technology to reconsiderthe stock exchange works. This is one of the main sectors that come around to the idea which can be actually useful beyond. The cyber function again provides a lot of enthusiasm andthere's talk about a revolution,the caution is that whenever hear the word revolution most to be consider a lot of time and in fact most of them fail.The crypto currencies are kind of coming down but there's been a lot of investment and not much in terms of outcomes mostly because there's a lot of experimentation and the technologies for early stage. The Hype Cycle for emerging business technology, 2020 highlights Blockchain business value in form growth rate that will significantly change society and business over the next five to ten years as shown in Figure 2.

III. COMPETING STANDARDS

Many competing standards with its fact of every coin and crypto currency were heard about an alternative standard economist. These competing standards of various crypto currencies are shown in Figure 3.

Standards are solving a specific problem and so when all these alternatives ascension provides different solutions to different types of problems and also that is not perfect but over an entire ecosystem of different solutions from the one the work for finance and accounting to the ones that are more decentralized and distributed that will emerge over time now ironically. Even within the established standard which is becoming the largest Blockchain today at scale there's fierce fight to become an efficient payment system processing transaction of the same volume is visa MasterCard. About five billion went into big coin or crypto currency related startups in the last few years. There are some of the top ones most of the activity again is in finance for now but there's interest in logistics supply chain and a number of other applications.

IV. LITERATURE SURVEY

This paper explained issues related to implementation in different application of Blockchain technology in Financial Structure. The main contribution includes survey carried out about Blockchain upto 2019 in Commercial Applications, We conduct first systematic applications area of Blockchain, there are 8 applications area considered for the survey and It also addressed issues regarding security and privacy.

An entrepreneurs use tokens for business transactions and these tokens are used in future digital platform [1]. This may provide coordination among the stakeholders in this digital environment. The internet and the technical layers of networking support the enhancement of digital market over the past two decades. Also the survey says that the invention of smart phones and the transactional environment makes the system much more effective [2].

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 10 Oct. 2022, pp: 283-290 www.ijaem.net ISSN: 2395-5252

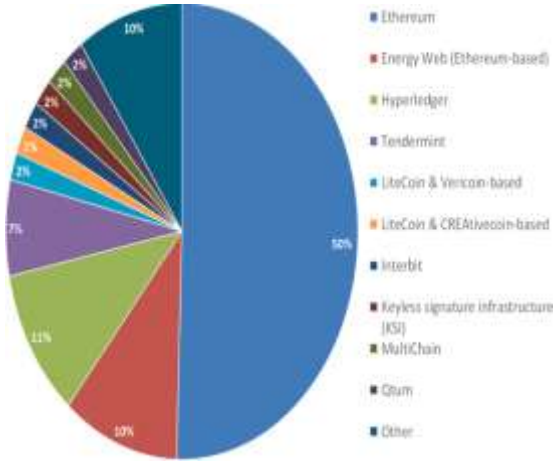

Figure 3. Competing Standards of various crypto currencies

There are two concepts as innovation centered and governance centered that are more promising to the public since these methods of Blockchain create spontaneous responses in the digital money transactions [3].The investigationreveals thatsafeguarding consumers from loss of information is moreimportantin the privacypolicies designed worldwide with transparency and make sure that consumers get the fruitful benefit by making better decisions[4]. The use of virtual transaction such as Blockchain technology and user adoption of bitcoin is focused. How exchange rate of bitcoin is calculated in market is analyzed, adoption and pattern of usage are analyzed geographically. To increase the activity of users by providing better services thereby increasing the revenue say for example what Facebook and other social media used to do. So a better platform may enhance user experience in making any move and tends them to do more activities that generate revenue for the stakeholders [5].

The Blockchain technology recently had an effective environment that extends the reality of distributed system with some trust free platform. It reveals the strength and weakness of the system and how secure the system maybe. They examine the cost, scalability, durability, as well as the hazards in the performance of the system [6].In virtual money transaction and the online communication network the transaction log are the major concern in this platform which boots the honest participation of the consumers. Consumers always expect a trusted protocol to share the transaction details and it must be more flexible and must be highly secure [7].Blockchain has been increased in recent days in wide range of applications because of the disruptive innovations. Authors discuss the key point in decentralized block chain management. It mainly focuses on the risk which occurs globally. Risk may disempower the entire ecosystem, so by using effective algorithms it will be corrected. Distributed database, irreversibility of records, computational logic, peer-to-peer transmission, transparency with pseudonimiety are the key factors to be concentrated to make the Blockchain works perfectly [8]. The market risk and security breaching they could find more investors using virtual currency if the system is more transparent. Liquidity of currency may be considerably less if the transparency is likely to change. It shows that if the investment is done with single identifiers more profit is concentrated by the consumers and stake holders [9].

The effects of network competition in financial market areanalyzed over a period to find the change in exchange rate of crypto currency. Competition of different virtual currencies is also considered for making financial assets more profitable [10].An open source software developments are in huge surgenowadays that make the virtual currency to a bit high level of intensity among stake holders. Individual programmers and economists try hard to make those environments a better one [11].Therecent research shows that without the intervention of bank private virtual money can be transacted and 24/7 trading in commercial market using virtual currency likes bitcoin [12].The legal discussion about bit coin and the problem of trustless transactions that has digital assets makes trouble in trustless platform. To illustratestherise of internet make the digital currency more spectacular. Among all bitcoin is very famous. Better understanding about bitcoin can be gained toconsider the economic incentives which drive the users and creators [13].

Current writing orders blockchain networks severally. These classifications are shaped by the organization's administration and consents as open, private and united as in the Table 1. In open blockchains (permissionless) anybody can join as another client or hub digger. In addition, everything members can perform tasks, for example, exchanges or agreements. In private blockchains; which alongside the united have a place with the permissioned blockchain class, normally, a whitelist of permitted clients is characterized with specific attributes and authorizations over the organization activities. Since the danger of Sybil assaults is practically immaterial there, private blockchain organizations can stay away from costly components. All things considered, a more extensive scope of agreement conventions dependent on disincentives could be received[14].

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 10 Oct. 2022, pp: 283-290 www.ijaem.net ISSN: 2395-5252

V. BREAKTHROUGH IN BLOCKCHAIN

Blockchain is a chain of blocks were transactionsare inside those blocks as recordsshown as in Figure 4. The digital records are kind of fender (HASH) storing overtime in a Blockchain can be represent the anything want from a digital asset to credentials to currency happens to be an application right where the transaction moving back and forth in a giant distributed public ledger [15].

Table 1. Property and classifications of block chain

Property	Public	Private	Federated
Consensus	Costly PoW	Light Proof-of-Work	Light Proof-of-Work
Mechanism	All miners	Centralised organisation	Leader node set
Identity	Anonymous	Identified users	Identified users
Anonymity	Malicious	Trusted	Trusted

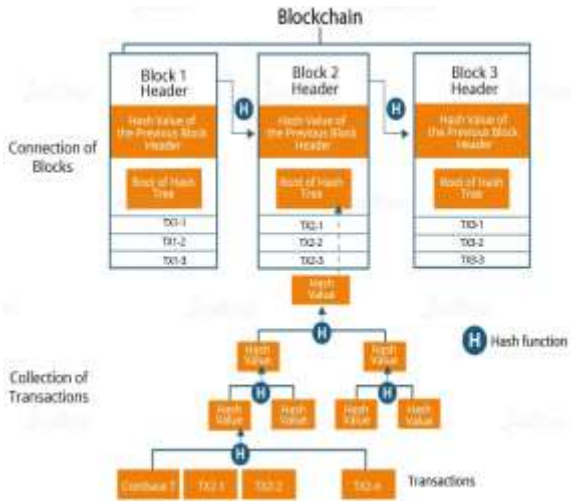

Figure 4. Blockchain transaction flow diagram [16]

Aninventive cryptography behind are mostly mix up of computer science and game tear so what keeps this giant distributed ledger secure is incentives a system that in a totally distributed way as shown in Figure 5. The banks trusted intermediaries in many transactions with system that can transfer value from A to B, without intermediate in the picture and unpack where do intermediary still playing a role versus not.There are three fields converging around the same technology first one of course computer science is leading the effort and the research also but economists consider about market design how to match labor capital ideas in society and all and actually one example where can start this may lead to a new type of organizational form something that it's even faster and bigger than a multinational corporation [17].The last bit is contracting the law and it is the slowest to adopt during programming language for crypto currency.

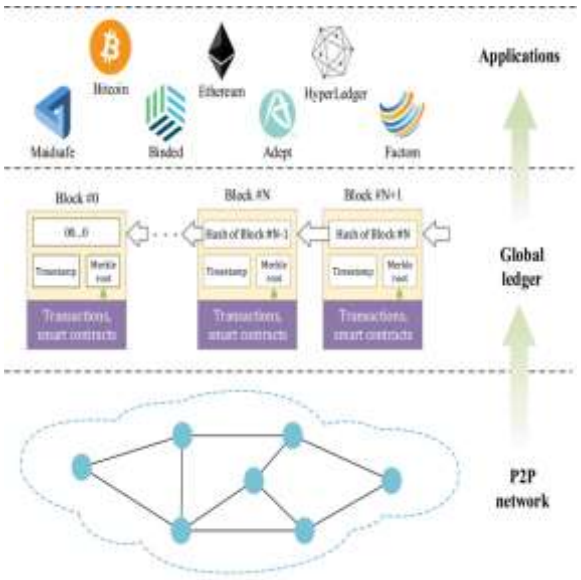

Figure5. Detailed Blockchain transaction connecting network and crypto currencies

VI. TECHNOLOGY CHANGES IN TERMS OF COSTS

The economists consider about a new technology they usually cheat, so uncertainty is out there and difficult to understand as well. It have an impact versus and so what to do when to cheat about cost tried to take a step back and ask all told the impact that this technology can have on society. The fundamental costs that are changing the blocks into a system with a Blockchain were amazed.Saving in terms of what trying to deliver to a customer and to the business economy in general and landed on two basic costs so the first one is this idea of the cost of verification. No data integrity and being able to rely on transaction attributes it's key to pretty for every market [18].Blockchain can substantially reduce under certain conditions the cost of verifying key transaction attributes that share a little bit more in the second one.Second one is a little bit more subtle and is the cost of networking the cost of running a decentralized network that can agree on things they call it internet level consensus and it's quite powerful one[19].

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 10 Oct. 2022, pp: 283-290 www.ijaem.net ISSN: 2395-5252

1.1 Costless Verification

The first costless verification throughthe transaction t_0 run drives action carry lots of attributes from the parties involved their credentials as shown in Figure 6 the timestamp value that is exchanged and most of the time that rely on those attributes and everything goes well to buy something receive economy keeps going right but every now and then an exception arises problem comes in and when that happens the way we deal with this in society we perform some sort of audit and itcan audit as actual auditors coming into the firm but someone running a softer processor and running some checks some labor involved and that all that is currently costly[20].

There is an exception some point often transaction is big enough and what can do if recorded those attributes property on a Blockchain. To trust those attributes which will be a key problem about provenance and supply chain that perform audit which is practically zero cost this is called cost verification and it's quite a big change for deliver goods in society[21].

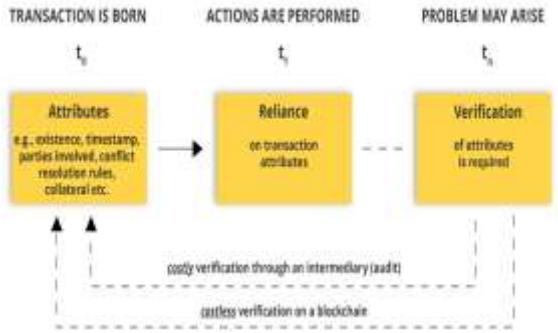

Figure 6. Costless Verification

1.2 Data leakage

Every time when people open a bank account, they will subscribe to the various services, there leaking private information at every step okay and this information leakage is necessary because of course need to prove that credentials correct. In other case, changing in a trade between two business partners maybe solvable that pay on time and side effect information leakage is growing by the day right. It's almost impossible to contain this much for the reasons that heard in a previous stock and so maybe a better solution is to avoid the data being out there in the first place after all if trying to open a bank account maybe the bank needs to know the person able to open a bank account in the United States yes or no or is there a process for them to recover my address in case of an exception watching could allowto develop such a system that is much more resilient or to cyber security attacks.

1.3 Integrity of Data

The key idea here is to build integrity into system from every bit of time when information is recorded for integrity and committed to an immutable on trial. A bank that can prove that have enough reserves without disclosing information about the accounts and this kind of recombines things that are around for a long time like this trees but when combine that with the crypto currency can start all to meeting a lot ofthis makes as shown in Figure 7.

1.4 Networking Cost

The second cause that the cost of networking and it may argue the ability to do crowd source ideas labor capital over the internet for many years now right there's many pop from there really based on this idea that can match make across different location the best possible solutions to different problems.Now all of this plot firms rely on to meet in the middle.

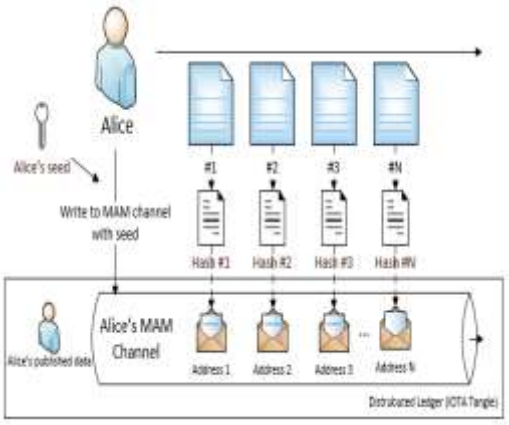

Figure 7. Data Integrity through Costless Verification

A natural monopoly is at this point switching costs are low but at the same time some of these intermediaries I've been able to appropriate a lot of the rents of divided they create to society.This change in the cost of networking is what economists call an architectural change it changes our firm combines and puts together value inside their value chain and it's the kind of change that is a challenge to incumbents, because it takes our business model any totally shuffles it around the way can deliver value not sure an example in a second is fundamentally different under this new regime.In the current model usually rely on some sort of trusted notes and those notes are costly to maintain and costly to secure and as was stated before some things are more decentralized system can be much more resilient to things like the web cams and add the DVR's waking up and that packing back.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 10 Oct. 2022, pp: 283-290 www.ijaem.net ISSN: 2395-5252

1.5 Cost of selection and sustaining the integrity of the nodes

Cost of computation and maintaining the integrity of the nodesdepicts the cost of computation and maintaining the integrity of the nodes.Example banking is one of the first sectors that are kind of being exposed to this. But industries that create value within ecosystem and kind of apply the same logic.So to transfer value across the globe, it may have set of nodes that are trusted parties industry system In a decentralized ledger environment like big coin that relying on the cost of computation often become is criticized for all the energy waste but cost it takes and the legacy systems to run a lot of the banking infrastructure today.The energy is actually quite important because creates what economists call a some commitment in the game theory part this is the part that prevents a rational actor from attacking to system because they would lose money on it and so the best incentive is actually to keep the system running of course this doesn't prevent the political intention but at least is quite a defense for most of these platforms.

Now when economist at on action to meters at a lot of value to society they make market safe riding assured we get curated results when we do a search and so does roles are still there and will still be valuable in a ward went with a Blockchain what gets interesting is that of course payment rails reputation system meditate about a lot of what we were being be do it's settling payments and managing a giant reputation system those things are going away but auto parts of what those players are doing are still very viable right so checking the idea of the host or checking the safety of the car older services are valuable but some of those markets are about to become a lot more competitive.

Is idea was like if running a firm which activities keep within the firm vertically integrated verse which one should use a market for.ABlockchain can make the market much more efficient it lowers the cost of transaction but at the same time it can replicate some of the more interesting forms of governance did see within firms.

VII. APPLICATIONS

1.6 Central bank

Central banks there are a lot of interest in this not here inIndia. It's the fed is one of the probably most conservatives because there's so much at stake by places like Singapore Canada even the UK that are actively exploring what would be a central bank backed this occurrence look like, it hear the skeptics in the room saying well we had this currency for awhile yes but it's essentially only visual between that central bank andthe banks and the citizens are kind of using some product built on top of that if had a system like this for example quantitative easing can be automatically distributed in a much more direct way taxation and other issues could be automated the reef substantial cost savings but it wouldn't expect any central bank major central bank to make a move on this anytime soon.

1.7 Finance

Finance and this is the sector that is really embrace this because remember to cost do like the first one the cost of reification the fact that can store and settle any reconciled records at a cheaper cost.So they like the first part the like build less the cost of networking because the second one challenges the revenue streams right and so in the long run some of these more open protocols may challenge even establishing come by here seeing a number of players that are saying can we connect the small correspondent bank in Europe to a to a small correspondent banking we are going through a middle man.

1.8 Money Transfer

Similar with money transfer of course when 're doing a remittance a lot of the cost of the remittance are not really coming from transferring the information they come from that lost my especially in certain countries from the ML and KYC. So know customer anti money laundering piercing models were essentially 're taking the idea that a secure message can trickery value and so companies like opera or circle are taking years dollars writing and edging contract on a big production so that if the value fluctuates within the three seconds of the transfer is taking place 're insured and on the other end the consumer to become the remittance will go to a convenience store and collect the remittance in the local currency so 're saying the technology being applied to the value chain from the ground up.

1.9 Micropayments

Micropayments imagine if every browser and a digital wallet most of the streams of payments today in a browser are putting credit card in paying for a service what about the reverse flow what if answering a survey often it may get a gift card right there's all these instances where could actually crowd source ideas and labor within the browser in a much more interesting way or maybe people would be willing to pay for content and not be stopped every time they hit a pay well right so one of the reasons why lot of users don't subscribe to multiple outlets is because we tend to read from multiple sources so maybe we'll pay for a pay well on one source but then

we like to read at some point an article from an outer wall of this could be streamlined if have a kind of a giant many bank accounts in every browser and of course is going to be security risk with that.

1.10 Crowdsourcing

Outsourcing imagine an up and this is actually some of the experiments that are taking place in this space where anybody in the word can performance task for from phone and get paid instantaneously right so if have something big going can do it and simplify they'll process substantially.

1.11 Identity and privacy

Identity and privacy when go back to the target data breach ten million credit cards right leaked. What if we could just this close what's necessary to perform the transaction and have crypto currencies? Cash they're offering much are privacy action in big point because it is not really anonymous.

1.12 Healthcare

Healthcare is about digital health records this is where Google with deep mine as realize that if want people to start showing information we do about their health need a system in place that will ensure that they can trace are the data is being use right and can keep can gain some control over does and digital assets which are linked to their help.

1.13 Provenance

Provenance and supply chain makes a lot of sense about something like a diamond it's an object that has some physical properties that don't want out there can break it but that's probably not what want to do and if store just physical properties on a Blockchain many of us some sort of this the fingerprint for dad for that one good and so can trace blood diamonds more effectively but then people are applying this to all sort of other items that don't have the same property of a diamond and it's not clear here if 're introducing garbage and original date eyes very much garbage in garbage out so hear a lot about the Blockchain is useful because of its immutability but immutability is only good if have a secure way to store correct information at the first time and this is where IOT can play a big role anything that's a digital asset can be traced sold traded licensed to a Blockchain in a very efficient way so people are playing with how do we do did rights for music in a way that's more transparent so that an artist can tell when a certain song is being played on a plot from that's sting their music.

VIII. CONCLUSION

This investigationcontributes to business model research by fostering an understanding of how technology, i.e., blockchain technology, influences financial structure and entrepreneurial experimentation for commercial applications. The blockchain business model taxonomy is a framework for describing, classifying, visualizing, and analyzing technology-specific business models, whereas the archetypal patterns show typical instances of it. The centers around two parameters that were influenced by blockchain innovation are the cost of networking as well as cost of verification. This aimed at business sectors to flourish, members should have the option to productively confirm and review exchange traits, including for instance, the accreditations and notoriety of the gatherings in question, qualities of benefits traded, and outer occasions and data that have suggestions for legally binding courses of action. Outside the limits of an association, this is ordinarily accomplished by depending on confided in middle people. In return for their administrations, delegates charge expenses and benefit from their capacity to watch all exchanges occurring inside their commercial centers. This instructive preferred position, joined with system impacts and economies of scale, gives them generous market power and authority over market members. Outcomes of market power incorporate more expensive rates, client lock-in and high exchanging costs, the nearness of single purposes of disappointment, control hazard, obstructions to development, and diminished protection.

REFERENCES

[1]. Catalina, Christian and Gans, Joshua S 2019, Initial Coin Offerings and the Value of Crypto Tokens. MIT Sloan Research Paper No. 5347-18, Rotman School of Management Working Paper No.3137213.http://dx.doi.org/10.2139/ssrn.3137213

[2]. Zhao, J.L., Fan, S. & Yan, J 2016, Overview of business innovations and research opportunities in blockchain and introduction to the special issue. Finance Innovation 2, 28. https://doi.org/10.1186/s40854-016-0049-2

[3]. Weking, J., Mandalenakis, M., Hein, A 2020, The impact of blockchain technology on business models – a taxonomy and archetypal patterns. Electron Markets 30, 285–305. https://doi.org/10.1007/s12525-019-00386-3

[4]. Al-Saqaf, Walid , Seidler, Nicolas 2017,Blockchain technology for social impact: opportunities and challenges ahead, Journal of Cyber Policy,Routledge , 2373-8871, https://doi.org/10.1080/23738871.2017.1400084

[5]. Sinclair Davidson, Primavera de Filippi, Jason Potts 2018, Blockchains and the economic institutions ofcapitalism. Journal of Institutional Economics, Cambridge University Press (CUP), 14 (4),pp.639 - 658.https://doi.org/10.1017/S1744137417000200

[6]. Carleton Athey, Susan and Catalini, Christian and Tucker, Catherine E., 2018, The Digital Privacy Paradox: Small Money, Small Costs, Small Talk. MIT Sloan Research Paper No. 5196-17, Stanford University Graduate School of Business Research Paper No. 17-14, http://dx.doi.org/10.2139/ssrn.2916489

[7]. Christian Catalini, Joshua S. Gans, 2020,Some Simple Economics of the BlockchainCommunications of the ACM, July 2020, Vol. 63 No. 7, Pages 80-90.https://doi.org/10.1145/3359552

[8]. Eken, M. H., & Baloğlu, E. 2017, Crypto Currencies and their Destinies in the Future. International Journal of Finance, Banking Studies (2147-4486), 6(4), 1–11. Retrieved from https://www.ssbfnet.com/ojs/index.php/ijfbs/article/view/21

[9]. Lam, Tsz Yiu, Dongol, Brijesh, 2020,A blockchain-enabled e-learning platform, Interactive Learning Environments, Routledge,1049-4820, https://doi.org/10.1080/10494820.2020.1716022

[10]. Zhu, H., Zhou, Z.Z. 2016, Analysis and outlook of applications of blockchain technology to equity crowdfunding in China. Financ Innov 2, 29. https://doi.org/10.1186/s40854-016-0044-7

[11]. Halaburda, Hanna and Gandal, Neil, Competition in the Cryptocurrency Market 2016. updated version published as "Can we predict the winner in a market with network effects? Competition in cryptocurrency market," in Games 7 (3), 16, NET Institute Working Paper No. 14-17, http://dx.doi.org/10.2139/ssrn.2506463

[12]. Neil Gandal & Hanna Halaburda, 2014. "Competition in the Cryptocurrency Market"CESifo Working Paper Series 4980, CESifo. https://www.cesifo.org/DocDL/cesifo1_wp4980.p df

[13]. Guo, Y., Liang, C, 2016, Blockchain application and outlook in the banking industry. Financ Innov 2, 24. https://doi.org/10.1186/s40854-016-0034-9

[14]. Fran Casino, Thomas K. Dasaklis, Constantinos Patsakis,2019,A systematic literature review of blockchain-based applications: Current status, classification and open issues,Telematics and Informatics,Volume 36,Pages 55-81,ISSN 0736-5853. https://doi.org/10.1016/j.tele.2018.11.006.

[15]. Atzori, M. (2017). Blockchain technology and decentralized governance: Is the state still necessary? Journal of Governance and Regulation, 6(1), 45-62. https://doi.org/10.22495/jgr_v6_i1_p5

[16]. Blockchain transaction flow diagram, Available at https://intellipaat.com/blog/tutorial/blockchain-tutorial/how-does-blockchain-work/

[17]. Gerald P. Dwyer,2015,The economics of Bitcoin and similar private digital currencies,Journal of Financial Stability,Volume 17,Pages 81-91,ISSN 1572-3089. https://doi.org/10.1016/j.jfs.2014.11.006

[18]. Xuan Luo, Zehua Wang, Wei Cai, Xiuhua Li, Victor C.M. Leung,2020,Application and evaluation of payment channel in hybrid decentralized ethereum token exchange,Blockchain: Research and Applications,Volume 1, Issues 1–2,100001. https://doi.org/10.1016/j.bcra.2020.100001

[19]. Yoo, S. (2017), "Blockchain based financial case analysis and its implications", Asia Pacific Journal of Innovation and Entrepreneurship, Vol. 11 No. 3, pp. 312-321. https://doi.org/10.1108/APJIE-12-2017-036

[20]. Saurabh Ahluwalia, Raj V. Mahto, Maribel Guerrero2020, Blockchain technology and startup financing: A transaction cost economics perspective,Technological Forecasting and SocialChange,Volume 151,119854.https://doi.org/10.1016/j.techfore.2019.119854

[21]. Cai, Y., Zhu, D. 2016, Fraud detections for online businesses: a perspective from blockchain technology. Financ Innov 2, 20. https://doi.org/10.1186/s40854-016-0039-4