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BLOCKCHAIN AS A SECURE AND DECENTRALIZED COMMUNICATION TOOL FOR FUTURE SUSTAINABLE DEVELOPMENT

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Abstract

This article presents a distributed ledger (blockchain) technology in terms of future sustainable development. This study based on private, public and global communication in different industries. Growing demands of secure and decentralized transactions throughout the world show the need for Blockchain technology as a means of operations and communications. The blockchain system is entirely decentralized and allows users to exchange messages effectively and securely. The paper's highlight is the projected future use of blockchains as a communication tool in every business and digital economy for secure and sustainable development, showcasing its benefits and limitations that are confirmed based on the experts' different experiments. Furthermore, the article offers recommendations for using the blockchain to complicate its identification in future communications significantly. Paper also concludes that using the blockchain system can be beneficial and strengthen communication and digital technologies

in the future.

I.INTRODUCTION

Blockchain is a circulated file that includes an ever-growing, looked after out rundown and squares and statistics stockpiling devices related to numerous workers. Genuinely, blockchain is a decentralized and relaxed statistics base of exchanges depending on decentralized hubs [1]. Today, with the presentation of new and slicing facet innovations and specific applications always, blockchain innovation is becoming an inexorably significant method of current correspondence networks due to its various skills. Blockchain capacities are confirmed in every component of statistics stockpiling, security and affirmation. Blockchain decentralized facts framework can probable take care of cheats and may help reduce defilement.

Blockchain innovation empowers alternate coins without center people (any bank, or different budgetary basis, or even paypal). On this manner, people send coins straightforwardly and securely concurrently [2]. The blockchain has the potential to interface billions of gadgets, which can share information in a superior manner that results in enhancing our lifestyles. Notwithstanding the truth that the blockchain benefits are boundless, severa difficulties are confronting receiving the blockchain in fact. Blockchains have extended a variety of consideration dependent on the virtual currencies, e.g., bitcoin but cryptographic sorts of money may probable be the eventual destiny of correspondence. Blockchains are remarkable; they may be considered as every otherkind of statistics innovation advancement that would alternate the enterprise and change [3].

Blockchain innovation for the most part has vital attributes of decentralization, determination, obscurity and discernibility. With those characteristics, blockchain can basically spare fees and enhance skillability. The paper gives an outline of the blockchain as destiny specialized gadgets with presenting the mixture blessings and difficulties. We infer that the utilization of blockchain innovation as destiny specialized units can provide a super method that could fundamentally clear a path for creative, secure plans of movement and dispersed safe programs.

Because the effect of blockchain innovation on the improvement of the specific correspondence channels typically unexplored, the present day investigation appears to fill this pertinent hollow hypothetically and for all intents and purposes by using placing the accompanying two aims:

1. Defined and conceptualize the blockchain innovation within the commercial enterprise and man or woman correspondence fragment.
2. Discover the feasible ramifications of blockchain innovation in destiny correspondence.

The commitments of this exploratory investigation are triple. 1st, the paper gives a basis and professionals survey that exemplifies the thoughts of blockchain innovation. 2nd, its immediate impact concerning personal and private communication. Third, the study provided the future projections of use of Blockchain technology in various industries.

This study suggests potentially exciting avenues for future research. One of these avenues is the relative infancy and high implementation cost of blockchain technology which makes it challenging to adopt the technology. Still, by reducing its implementation cost through different research methods, adoption can be made accessible. Another avenue refers to the potential of blockchain but challenges in terms of skills which can be abridged by imparting knowledge about the technology through various means of education. In future, new and propelled security components can be sent in this blockchain framework through more research. The study can help Future researchers to focus on the role of blockchain in diversifying the risks in the financing of global corporations amid the crisis of 2020.

II. CONCEPTUAL BACKGROUND

2.1 *Defining Blockchains*

Blockchain is a piece of the fourth present day upheaval and could extensively have an impact on commercial enterprise via converting the cutting-edge economic system and society. It has the ability to change the current net from "sharing information" to "Value Exchange." afterward, blockchain innovation is relied upon to reform the operating methods of each industry, exchange, commercial enterprise and practice, and develop the short improvement of the data prepare financial system with recognize to an international scale [4].

2.2 *History and Development of Blockchains*

E-Cash, a complicated installment framework that became clearly totally fit to sending electronic coins securely and namelessly yet was now not a triumph [5]. In 2008, a person named satoshi nakamoto illustrated some other convention for a peer-to-peer digital money framework utilising a virtual foreign money known as bitcoin, which become a bit piece of blockchain.

A pseudo-man or woman named satoshi nakamoto, in october of 2008 despatched every other kind of digital superior cash (bitcoin: a peer-to-peerdigital coins machine) as white paper joined to an e-mail to a bit gathering of cyber specialists and cryptologists who offered it as a bitcoin [6].

It turned into a big ahead bounce. At some stage in the underlying degrees, blockchain innovation turned into no longer mainstream and even no longer regarded to popular society. However, as bitcoin kept on walking securely and consistently after some time, society has identified the outstanding capability of blockchain innovation and its programs, in cryptographic coins' addition to in severa special territories.

These days, blockchain innovation has been carried out in distinct regions, as an instance, cryptographic sorts of cash in the budgetary region, which incorporates bitcoin, ethereum, and zcash and so forth bitcoin changed into the main open-source, distributed superior coins' network dependent on the blockchain innovation. It became the first completely decentralized automatic installment framework [7]. Notwithstanding bitcoin, ethereum (another public blockchain) is belowattention as apparently progressive. This application is an open-source,

blockchain-primarily based application that offers usefulness in playing out the intended 'intelligent contracts' or shared agreements [8]. This agreement execution depends on packages that take a look at whether an object or management has been dispatched through a provider. After take a look at, the alternate of cash has to be feasible. Alongside those traces, it's far a completely programmable blockchain that disperses rationale that could traditionally be performed on a brought together worker.

The development of blockchain arranged into three particular stages which might be blockchain 1.0, 2.0, and 3.0. also clarified every degree as some distance as its turn of events. Blockchain 1.0 is the association of digital forms of money as a shared cash installment framework, e-wallet administrations, and character digital foreign money. Blockchain 2.0 is the extensive blockchain programs than basic cash exchanges, together with shares, securities, advances, clever belongings, and speedy contacts applied in particular for monetary administrations, crowdfunding consisting of ethereum keengreements. Blockchain 3.0 is growing blockchain packages beyond coins, money, and markets, for instance, government, wellness, technological know-how, education, subculture, and workmanship. It's far greater considered as fairness utility beyond cash and marketplace economic system [10]. The development of blockchain from 1990 - 2020 as seemed in (fig. 1), [11]:

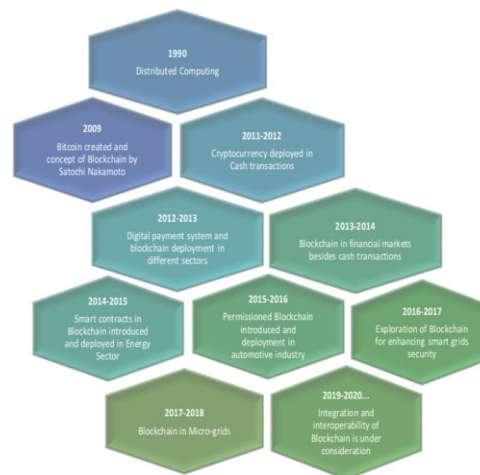


Figure 1: Evolution of Blockchain

2.3 Methodology of Blockchain

In blockchain, there may be no valuable server or system which maintains the facts. The data is circulated over various computer systems(nodes) around the globe which might be associated through the blockchain. This framework is referred to as notarization of information as it is to be had on every node and is freely simple. Hub receives related to blockchain using the purchaser that enables in approving and engendering the change to the blockchain. Authentication of data is achieved in 3 particular structures and blockchain works on a distributed network form see (Fig. 2, 3), [12].

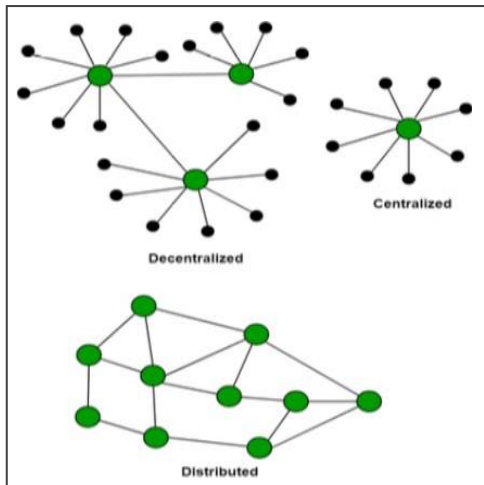


Figure 2: Notarization of Data Network

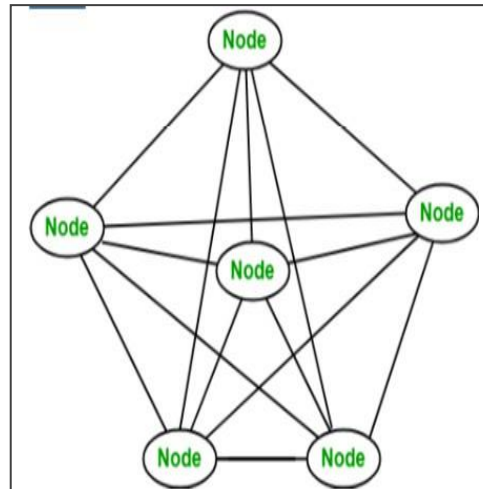


Figure 3: Nodes in a Blockchain

2.4 Types of Blockchain

Public: A public blockchain is also known as permission less blockchain where anyone can participate by mining a block, running a node, or by making any transactions. Litecoin and Bitcoin are examples of public blockchains.

Private: It is also known as permission blockchain, where participants are only selected individuals or member of an organization. Fabric and Sawtooth and Multichain are examples of the private blockchain.

Consortium: These are partially decentralized blockchains which are controlled by a group of organizations. All the members have the authority to run a full node, or mining etc. R3 and EWF are examples of consortium Blockchain.

Types of Blockchain Network, the types of Blockchain and its properties as shown in (Table 1, 2):

| Public | Private | Consortium |
|------------------------------------|---|---|
| | | |
| Many Unknown participants | Known participants from one organization | Known participants from multiple organizations |
| Read and Write by all participants | Write Permissions centralized and Read maybe restricted | Reads maybe restricted but writes require consensus of participants |
| Consensus by proof of work | Multiple algorithms for consensus | Multiple algorithms for consensus |
| | | |

Table 1: Types of Blockchain Network

| Property | Public Blockchain | Consortium Blockchain | Private Blockchain |
|--------------------------------|-----------------------------|-------------------------------|-------------------------------|
| Consensus Determination | All Miners | Selected set of nodes | One organization |
| Read permission | Public | Could be public or restricted | Could be public or restricted |
| Immutability | Nearly Impossible to Tamper | Could be Tampered | Could be Tampered |
| Efficiency | Low | High | High |
| Centralized | No | Partial | Yes |
| Consensus Process | Permission less | Partial permission | Permissioned |

Table 2: Types of Blockchain and its properties

III. BLOCKCHAIN IN PRESENT COMMUNICATIONS

3.1 *Private Communications and Social media*

Blockchain is a conveyed information base that includes an ever-developing composed rundown of facts and data stockpiling devices associated with various people [13]. Blockchain innovation permits participants to make sure about the settlement of exchanges, accomplish the pastime, and flow of sources effortlessly [14]. In terms of private communication, zoom application provides a tool for video conferencing. Loki messenger has provided a platform for users to transact and communicate in private, ensuring resilience and functionality [15].

The Steemit platform deploys a blogging and social networking website superimposed on the Steemit blockchain database. It is an emerging social media platform over Blockchains, to realize and assess the actual diploma of decentralization and the pragmatic impacts of the blockchain-pushed prize framework within the advanced global [16]. A decentralized way to deal with blockchain innovation in lengthy variety interpersonal communication guarantees protection and empowers e-trade, crowdfunding exchanges, simply as savvy applications and agreements. These days, automated casual agency media levels, as an instance, FB, LinkedIn, Instagram, twitter, and so on, give free get admission to. Absolutely, development and worker foundations are vital to informal communique degrees, and their advantage centers round publicizing and exam within the interpersonal organization business time.

3.2 *Public and Business Communication*

Individuals over the world had been inquiring for more "straightforwardness" in company and government dealings, and blockchain public facts can likewise satisfy this international need. Blockchain today is utilized in specific business facts frameworks in the Management Information Systems (MIS) field, however in bookkeeping, banking, account, monetary elements, regulation, and beyond [17]. Blockchain likewise presents every other administration framework with an extra equitable dynamic element, and decentralized (autonomous) Institutions that may paintings over an agency of computers and not using a human mediation [18].

Blockchain usage and applying in our business sectors today such as, Future Energy Systems, Financial and Banking Sector, Supply Chain Management, Stock Market, voting systems, Education systems, Healthcare Systems, Real Estate, and other

IV. BLOCKCHAIN AND FUTURE

Initially, it seems that the fate of blockchain is lots greater than bitcoin, which reputedly has disregarded to deliver on its guarantee because the money of factors to come and has persevered some outstanding robberies and breaks.

In a socially-prepared global, the function of blockchain interchanges is to assure that everyone has both deceivability and believability at every factor. The combination of computerized money and dispersed file innovation focuses to a

fascinating – and pleasing – future from a client perspective. Taking the case of future of self-driving cars may hold their very own private advanced cash to pay for gasoline, parking spots and fixes, or allow themselves to be bought or leased by consumers.

Agricultural countries are stricken by bumbling and inadequately worked government bodies, just as organization, antiquated (by means of modern-day standards) record-retaining frameworks, and debasement. Blockchain innovation can go approximately as a scaffold toward mechanization, banking, network, and straightforwardness for those countries. Regardless of the impact of blockchain innovation being maximum firmly linked with digital money exchanges, as a preferred rule, the blessings that agricultural international locations can harvest for report-preserving and the economic place should end up being incredible. Notwithstanding, the undertaking of using blockchain innovation on a worldwide scale may be met with difficulties.

3.3 *New era of Global future communication.*

The fundamental factor about blockchain is that it allows various gatherings to stay inside the chain even as now not being possessed by way of absolutely everyone. it means that associations who rely upon their provenance, certifications and elite admittance to records for his or her extra worth may want to get themselves disintermediated. Some of the best use of Blockchain in future are Smart Contracts, Social Networks, Payment, settlement and Clearing, Financial Transactions and many more.

LEVELG and GWallet.Tech are another example of decentralized use case in the blockchain ecosystem. LEVELG is a Stellar.Org blockchain based token and GWallet.Tech is a decentralized exchange with its unique anchors which all transactions are recorded in the open blockchain ledger. In order to use the peer to peer feature on GWallet.Tech, users need to have a certain amount of LEVELG token as the battery. LEVELG token will not be deducted which the users may choose to trade it again in the decentralized market after using the wallet feature. This is a brilliant move in making the market grows organically and driven by real users. It also defines its function as utility token and the most fascinating fact is the decentralized passion itself.

Blockchain revolution: how the era in the back of bitcoin is changing money, business, and the sector", referenced that blockchain innovation will be an essential resource for making sure mankind and the privileges of each person, a method for conveying truth, reducing extortion and circulating success, as the enterprise which dismisses the faux exchanges. Reducing edge blockchain advocates circulated an incentive thru decentralization, attractive the man or woman and making equal open door for all of us [19].

3.4 *Emerging opportunities of Blockchain*

Small and Medium Enterprises (SME): Blockchain will allow smes to operate and compete on comparable levels with larger enterprises all over the world. It's going to endure the fee of them the event to elevate reserves, get admission to credit, reason installments, to take part in savvy contracts, display screen flexibly chain, and overseeing computerized characters and forestall cheats. Development of an administrative structure in order to manage execution, make believe and confirmation simply as make acknowledgment will substantially affect the

development of smes [20].

Blockchain will be implemented on several sectors in the next short period, and examples of those fields power systems, 5G Telecommunications, Healthcare Systems, Agriculture Supply Chain and Blockchain-Based Smart Grids,

Blockchain development as clever blockchain in a while depending on subject's analytics with blockchain' and 'examination for blockchain'. This primary-of-its-type observe centers across the 4 issues every, in certifiable packages where blockchain is applied associated with investigative arrangements, and for blockchain wherein diagnostic preparations are applied [21]. These explanatory solutions for/with blockchain offer an advantage of earnings, protection, simplicity of operating collectively, and so forth there are two number one regions of blockchain programs in research which includes banking, the pressure community, and the democratic kind of sporting events. The alternative important application under examination is utilizing the blockchain with Internet of Things (IoT) innovation. Glide studies are predominantly engaged around blockchain's expected hobby for to a few degrees normalized, dispersed gadgets.

IoT portrays as "the affiliation and correspondence of numerous devices over the internet". "The novel business model" comprise things, for instance, the force community and casting a ballot [22]. Those make reasonable ground-breaking programs for blockchain due to the safety and wellbeing expected in their activities; the primary interest is sincerely normalized which makes it simpler for a blockchain agency to be worked around it and ensure it. At long closing, those are the great of the blockchain. The remaining future utility being proper now explored is blockchain's viable effect on the Internet of Things (IoT) devices. An IoT machine is a device this is associated with the internet or a company, but its vital capacity isn't web related. A version might be an eager refrigerator. The primary position is to go about as a refrigerator, but it is able to likewise interface with the net to upgrade purchaser experience. The decentralized, self-governing, and trustless capacities of the blockchain make it an incomparable segment to turn right into an essential constituent of IoT preparations [23]. Benefits of blockchain in future communication

Blockchain is a conveyed file, decentralized framework or records base, mutual over a public or personal processing business enterprise. Blockchain can be utilized in extraordinary financial administrations, as an example, automated resources, settlement and on line installment. The ones fields desire blockchain in extraordinary manners [24].

- First of all, blockchain is undisputable. The trade can't be changed once it is going into the blockchain. Companies that require excessive trustworthiness, unwavering pleasant and genuineness can make use of blockchain to attract in the customers.
- Except, blockchain is dispersed and might stay away from the unmarried purpose of disappointment situation. Concerning first rate agreements, the settlement will be accomplished by diggers consequently as soon as the settlement has been dispatched at the blockchain.
- Different benefits comprise agree with—in contrast to the unified framework, for example, focal governments giving economic requirements and change tokens, blockchain community, is going about as new accept as true with transports with decentralized information which might be being shared amongst an organization of sealed hubs.
- Security: blockchain community makes use of the single path hash paintings. The

yield bears no unmistakable connection to the data embedded. The cycle is irreversible in light of the truth that, given definitely the introduction, the records is absurd to expect to decide and alternate.

- Decentralization: community individuals are equal, and data can be legitimately traded
- Transparency: any piece of the change may be checked, and hypothetically, it thoroughly can be enhanced by way of new data a boundless number of instances
- Reliability: any enterprise at unapproved modifications can be disregarded due to irregularity with past duplicates
- Compromise: facts introduced to the framework may be checked by means of one-of-a-kind members.
- Confidentiality: information is placed away in a scrambled shape and the consumer can observe all exchanges yet cannot recognize customers that get or send statistics.
- Efficiency: all facts obviously revel in the pre-set techniques. Consequently, utilizing blockchain innovation can seemingly lessen the cost of labor in addition to improve proficiency.

4.3 *Challenge of using blockchain in future communication*

- The future scope of Blockchain technology is star bright, but it comes with a high initial implementation cost.
- Technical adaptability of the blockchain community is every other test which could squeeze the reception cycle, particularly for public blockchains. The 2 largest blockchain networks, the bitcoin blockchain can cope with 3 to seven exchanges for each 2nd, even though Ethereum can cope with kind of 20 exchanges in a second.
- The absence of consistency and standard pointers among the massive number of blockchain networks that might permit various frameworks to impart. The absence of such normalization throughout blockchain techniques likewise gets rid of consistency from fundamental practices like protection, making appropriation difficult.
- Shortage of skilled developers to access to the necessary pool of blockchain process. Blockchain technology, however, demands additional qualification and high skills.

V.DISCUSSION

Generally, mechanical tendencies set apart a protracted attempt to settled and arrive at a regular structure that may be suggested into the market. Like any mechanical development, blockchain is the equal; it's going to display slight appropriation at some point of the following few years. Notwithstanding the truth that there are numerous prospects, because of its persistent turn of activities and prolonged development, make it extra hearty and more stable to apply within the coming years defeating all the problems.

During 2018 and 2019, Blockchain commenced to choose up acknowledgment in more giant crowds, which triggered a massive enlargement inside the proposed administrations and programming applications, which would be founded on blockchain. Blockchain can be considered as an essential technology which has been a part of various known software applications and is used in multiple

industries such as Uproov, Bitcourt, Microsoft, Authentichain, everledger, Bitshares etc. used for data verifications purposes. Swarm, Storj, Multichain, Factom, Ethereum, Mirror, Blockstack, Securechain etc. for Data Management purpose. Financial applications include Waves, Starbase, Insurechain, kraken, Coincheck, Bitpesa, Coinbase, Mitecoin, Ripples etc. and many other such as namecoin used for domain name registration, Bitgive for donations, Medicare for healthcare units, playcoin for Gamings etc.

VI. CONCLUSION

With the plenitude of blockchain-based packages and use in various fields, trust in the life span of this disseminated document is expanding. After survey and exam of current investigations and as of now reachable use instances and programs with blockchain technology, we infer that blockchain is an essential piece of private, public and global correspondence these days. It thoroughly may be regarded as a future triumphing specialised tool in every field. Essential highlights of protection, protection, unchanging nature and consider within the exchanges of facts have expected benefits to the utilization of blockchain in destiny. These exquisite and striking highlights of blockchain supplied specialists with cutting-edge information into the exploration zone. Normally talking, blockchain as an intense specialized instrument is a profoundly energizing idea for the fate of provincial, public, and worldwide frameworks, to impact those directions, each scholarly and expert allies of blockchain power want to consolidate in addition revolutionary paintings with reasonable usage and programs in a genuine putting, showing the application and execution of the idea through and by to crucial companions and leaders.

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REFERENCES

1. Ajomand, N., Ullah, H. S., and Aslam, S. (2020). A Review of Blockchain-based Smart Grid: Applications, Opportunities, and Future Directions. arXiv preprint arXiv:2002.05650.
2. Beck, R., Stenum Czepluch, J., Lollike, N., and Malone, S. (2016). Blockchain—the door to without trust cryptographic exchanges.
3. Brandon, D. (2016). The blockchain: The fate of business data frameworks. *Worldwide Journal of the Academic Business World*, 10(2), 33-40.
4. Chung, M., and Kim, J. (2016). The Internet Information and Technology Research Directions dependent on the Fourth Industrial Revolution. *KSII Transactions on Internet and Information Systems*, 10(3), 1311-1320. <http://doi.org/10.3837/tiis.2016.03.020>
5. Gervais, A., Karame, G. O., Capkun, V., and Capkun, S. (2014). Is bitcoin a decentralized cash?. *IEEE security and protection*, 12(3), 54-60.

6. Iansiti, M. furthermore, Lakhani, K. R. "Reality with regards to blockchain," *Harvard Bus. Fire up.*, vol. 95, no. 1, pp. 118–127, 2017.
7. Jefferys, K., Harman, S., Ross, J., and McLean, P. (2018). Private exchanges, decentralized correspondence.
8. Knezevic, D. (2018). Effect of blockchain innovation stage in changing the monetary area and different enterprises. *Montenegrin Journal of Economics*, 14(1), 109-120.
9. Krishna, G. J., Ravi, V., Reddy, B. V., and Zaheeruddin, M. (2020). Shrewd Blockchain: A Formidable Combination of Analytics and Blockchain—A Survey. In *Smart Systems Design, Applications, and Challenges* (pp. 43-62). IGI Global.
10. Kummer, S., Herold, D. M., Dobrovnik, M., Mikl, J., and Schäfer, N. (2020). A Systematic Review of Blockchain Literature in Logistics and Supply Chain Management: Identifying Research Questions and Future Directions. *Future Internet*, 12(3), 60.
11. Lee, J. H., and Pilkington, M. (2017). How the blockchain insurgency will reshape the customer hardware industry [future directions]. *IEEE Consumer Electronics Magazine*, 6(3), 19-23.
12. Li, C., and Palanisamy, B. (2019, June). Boosted blockchain-based online media stages: A contextual investigation of steemit. In *Proceedings of the tenth ACM Conference on Web Science* (pp. 145-154).
13. Mirabelli, G., and Solina, V. (2020). Blockchain and farming gracefully chains recognizability: research patterns and future difficulties. *Procedia Manufacturing*, 42, 414-421.
14. Miraz, M. H., and Donald, D. C. (2018, August). Use of blockchain in booking and enrollment frameworks of protections trades. In *2018 International Conference on Computing, Electronics and Communications Engineering (iCCECE)* (pp. 35-40). IEEE.
15. Mougayar, W. *The Business Blockchain*; John Wiley and Sons Inc.: Hoboken, NJ, USA, 2016.
16. Peck, M. A blockchain money that beat s bitcoin on security. *IEEE Spectr.* 53(12), 11–13 (2016) <https://doi.org/10.1109/MSPEC.2016.7761864>
17. Praveen, G., Chamola, V., Hassija, V., and Kumar, N. (2020). Blockchain for 5G: A Prelude to Future Telecommunication. *IEEE Network*.
18. Puthal, D., Malik, N., Mohanty, S. P., Kougianos, E., and Yang, C. (2018). The blockchain as a decentralized security structure [future directions]. *IEEE Consumer Electronics Magazine*, 7(2), 18-21.
19. Swan, M. *Blockchain: Blueprint for a New Economy*, first edn. O'Reilly Media, Sebastopol, CA, 2018.
20. Tapscott, D., and Tapscott, A. (2016). *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World*. Penguin.
21. Thombs, M. and Tillman, A. A. (2018). Planning 21st century educational program for Bitcoin and blockchain considers. *Worldwide Journal of Global Business*, 11(1), 67-80. Recovered from <https://gsmi-ijgb.com/wp-content/transfers/IJGB-V11-N1-P04-Michael-Thombs-Bitcoin.pdf>
22. Tschorsch, F. also, Scheuermann, B. (2016). Bitcoin and past: A specialized review on decentralized computerized monetary forms. *IEEE Commun. Surv. Instructional exercises* 18(3), 2084–2123 <https://doi.org/10.1109/COMST.2016.2535718>
23. Ullah, H. S., Aslam, S., and Anrjomand, N. (2020). Blockchain in Healthcare and Medicine: A Contemporary Research of Applications, Challenges, and Future Perspectives. *arXiv preprint arXiv:2004.06795*.
24. Verma, D. K., Katheria, V., and Khaliq, M. (2019). Use Cases and Applications of Blockchain Technology in IT Industry.