



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 5, May 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.165



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

A Deep Survey on Drug Tracking System through Blockchain Technology

Jaydeep Sunil Badadare, Prathamesh Jeevandhar Chavan, Rohan Pashupati Gawarkar, Sunag

Dinesh Kashetty, Shubham Santosh Shinde, Prof.A.S.Hambarde

Dept. of Computer Engineering, KJCOEMR, Pune, Maharashtra, India

Dept. of Computer Engineering, KJCOEMR, Pune, Maharashtra, India

Dept. of Computer Engineering, KJCOEMR, Pune, Maharashtra, India

Dept. of Computer Engineering, KJCOEMR, Pune, Maharashtra, India

Dept. of Computer Engineering, KJCOEMR, Pune, Maharashtra, India

Dept. of Computer Engineering, KJCOEMR, Pune, Maharashtra, India

ABSTRACT: The human civilization progresses beyond contemporary conveniences, all aspects of life grow more sophisticated, and healthcare system is no exception. Individuals who are senior or incapacitated will benefit more from the breakthrough care delivery extrapolations. The pharmaceutical industries are the forerunners of this approach that perform tedious research into developing new and advanced drugs that are better and cheaper. These pharmaceutical companies work like any other companies where the scale of the economy and production is the driving factor towards the reduction of the costs of the medicines. This also has a side effect where a large number of medicines needs to be produced to keep the costs low that leads to an abundance of drugs that are not utilized by the time they are expired or not sold at the chemists. These drugs are often donated to the needy individuals at NGOs or other charitable organizations. But there isn't any effective framework to ascertain that these organizations indeed receive the drug donations. For this purpose, a system for accountable drug donation is proposed in this publication that utilizes the blockchain Framework to improve accountability. The experimentations have been crucial in the determination of the reliability of the presented methodology.

KEYWORDS: Pharmaceutical product tracking, Blockchain Framework, Drug Donation.

I. INTRODUCTION

There have been major advances in the medical fields in the recent times where a lot of research has been performed on these topics. This has been crucial as a number of different approaches have been utilized for the purpose of achieving an effective eradication of a number of diseases. This is in stark contrast to the days of the early humans as most of the diseases and the causes of these disease were unknown and a lot of lives were lost due to this occurrence. These early humans have been recorded to suffer and die due to some common illnesses that are easily curable nowadays. This is why the most useful and essential types of research has been performed for the maintenance of the health and the improvement of the healthcare infrastructure.

Amongst the most frequently utilized phrases is that "prevention is better than cure." It is also one of the more appropriate. Wellbeing is true riches since a healthy individual can perform to their full capacity and accomplish significantly more than someone who is unhealthy. This is a proven constant that has existed for millennia. To be competent to accomplish, work, or concentrate in a healthful, nutritious atmosphere, health must be valued in anyone's life.

As previously stated, healthcare is amongst the most essential aspects of life and must be prioritized in our lifestyles. But this is harder than it sounds, as many individuals do not even have opportunity to just go out and obtain treatments for a specific variety of symptoms since they work the whole day. However are certain persons, such as the crippled or those who are physically constrained, who are unable to visit the hospital on a regular basis because it is uncomfortable. Some elderly persons are unable to go all the way to the medical facility.

There are also several older folks who would be suffering from a disease and are residing independently. This is a major issue since, in an emergency, there is very little time to intervene and give quick medical treatment, which is impossible. This is why many elderly people are confined to hospitals since their conditions might deteriorate at any time. They have an extremely bad experience of health as a result of this.

Drug monitoring is a critical component for ensuring the secure and consistent distribution of medication under appropriate settings. A standard medication's life cycle will begin with the producers who create thousands of sets of medications. These units are then vetted via a series of companies before being sold to clients by merchants. This distribution network goes through numerous management changes before pharmaceuticals are supplied to a consumer, and the procedure is documented to follow the medication from its beginning to its end. Nevertheless, the prescription medications might not have been taken for a myriad of purposes, including a modification in the doctor's recommended amount, a modification in the course of medication, or adverse reactions, among others, resulting in pharmaceuticals that the individual no longer requires. These medications should, preferably, be distributed to other individuals who would profit from these.

Unfortunately, this is a difficult procedure to handle since these pharmaceuticals must be inspected by competent organizations and confirmed to be safe for future use before even being distributed. Numerous patients who cannot purchase medications can be saved by dispersal of leftover, guaranteed medicines at a cheaper price or even for complimentary, particularly in states where such medications are pricey. Furthermore, because most unwanted drugs are generally discarded in garbage containers or river systems, this technique can save hundreds of thousands of dollars in medications that would otherwise go to throw away each year, along with having a good consequences on the environment.

A methodology for monitoring wasted pharmaceuticals and confirming their integrity usually necessitates the use of a centralized server to monitor each drug as it moves through multiple participants. Producers, wholesalers (dispensaries and clinics), and consumers are among the participants. Despite the fact that this centralized agency maintains record of the medicine's route, it has significant flaws. For example, centralized frameworks raise privacy and security problems since they are constantly vulnerable to intrusion and infiltration. A decentralized solution, such as employing blockchain innovation to monitor pharmaceutical distribution, minimizes the need for a central server. A blockchain is really a tamper-proof decentralized system that registers all operations. As a result, among the most efficient deployments for such a platform has always been the usage of blockchain.

This literature survey paper segregates the section 2 for the evaluation of the past work in the configuration of a literature survey, and finally, section 3 provides the conclusion and the future work.

II. RELATED WORKS

Anupam Kumar [1] the pharma distribution system in India was expected to undergo a much-needed transformation from its own convoluted architecture to anything a little more accountable and productive. India's pharmaceuticals manufacturing costs are far cheaper than those in Western European countries, enabling it a worldwide participant in the medicine industry. Countless lives are also on the line, and block chain technology is the solution. A comprehensive and safe distribution network, in addition to the existing government initiatives and expenditures on medicine, is what can ensure the well-being of their friends and family. The administration intends to make significant progress in the area of accountability in the next decades at least. The openness of interactions, the accountability of medications by producing an examination, and the capacity to identify any efforts at data manipulation are all important benefits of the blockchain-based global supply chain.

Yue Li [2] discusses how medication accountability uses blockchain solutions in conjunction with other networks including the Internet of Things and artificial intelligence to ensure a stable, trustworthy, and predictable transportation network from manufacture to distribution. Each member administers the participating nodes through the use of blockchain technology, but each operation requires concurrence to guarantee that knowledge from the commencement of operations to all components of the supplier network is non-tamper able and identifiable. Stakeholders can use unique identifiers to upload the drug's distribution statistics into the blockchain at every step of the supply chain. Whenever an authorized node performs a "transaction" with some other location, the two nodes' integrity inspections must concur and sign electronically.

Randhir Kumar [3] the conceptual Approach is a safe blockchain-based architecture for healthcare availability and utilization amongst legitimate stakeholders. The architecture suggested can guarantee medication protection as well as manufacturing legitimacy. The present healthcare supply chain relies on third-party agreement, which is insecure in

terms of medicine protection. The suggested approach is premised on public key infrastructure (PKI) and digital signatures, and it can avoid replaying and man-in-the-middle attacks. Pharmaceutical companies will create drugs with data such as medicine identity, position, chronology, components, drug consumption, and adverse effects, all of which will be permitted by a statutory requirements shared ledger. For the information, the supplier creates an anonymized QR (quick response) barcode and adds the transactions to the public ledger. Whether any of the members wants to know more about the medications, they simply submit their public key with the producer. The supplier will secure the unique code and return it directly to the consumer, allowing them to scan it.

MazinDebe [4] suggested method for tracking the route of pharmaceuticals from its source to purchase behavior. Existing research has focused on this distribution chain; nonetheless, the suggested scheme integrates all participants through a blockchain network that includes all types algorithmically. For this approach's utilization, a variety of blockchain networks can be used. The Ethereum platform, both personal and publicly, Hyperledger Fabric, and Multi-chain are among them. While certain aspects of the distribution chain can be removed from the internet, the vast majority of smart tender documentation must be made public. The public Ethereum blockchain was selected as the blockchain network for our application.

Herbert Melendez Garcia [5] the suggested medication inquiry solution can satisfy the same need to deliver trustworthy value to the customer with a lower proportion than the entire supply chain transparency since blockchain as a service provides us assurance regarding information management in an accessible and irreversible way. Similarly, for agreement to be successful, a decentralized business connection is needed. Moreover, because our framework is an experimental studies executed alternative, the restrictions placed by information sources are appropriate. As a result, when it is accomplished on a wider scale and also with the required funding, the segment of performance benchmarks established in this venture must be taken into account. Finally, this approach might pave the way for future initiatives involving medication provenance or the development of the coverage intended at the Peruvian health sector through the usage of blockchain as a utility.

Erick Fernando [6] the implementation of blockchain technology utilizing microprocessors or mini products and consumer is the subject of this study. Ethereum is the blockchain - based platform that has been used. Ethereum is utilized in the architecture since it is a popular environment for building blockchain-based apps nowadays. The Microcontroller is the tiny PC instrument developed since it is a low-cost mini PC gadget that is extensively employed in the creation of integrated devices. Ubuntu 18.04 was utilized as the operating system. The findings show that the Raspberry Pi gadget may be employed in the establishment of distributed ledger technology as being one of the major nodes in a blockchain network that could be used in the biopharmaceutical industry. Further study will reveal how important blockchain technology would be for many firms and the corporate sector in the 21st century. One instance is the corporate sector, which could be used to assist all of its operations, such as drug manufacturers, shipping drugs (drug packaging histories), verifying drugs, and using this technology to classify drug facilities (publishing drug histories), read comments on drug panels, and enhance consumer commodities.

Bidi Ying [7] give the infrastructure for prescribed medication distribution blockchain system because the pharmaceutical distribution has various severe concerns, such as transparency, complication, and patient confidentiality. Dynamic identity is supplied to safeguard patient confidentiality, and an inexpensive authenticating methodology is devised. Components are meant to offer transparency for interactions in the supply of drugs, and activities with signature are acknowledged. Following that, a vulnerability assessment reveals that the methodology is capable of meeting the security standards.

Shaoliang Peng [8] we offer a novel approach for monitoring vaccine manufacturing. To increase vaccine manufacturing safety, we employ blockchain technologies to optimize the conventional production technologies monitoring method. It guarantees the protection and dependability of production data by combining multiple technologies with fast data transfer. It achieves blockchain integrity by utilizing the principal supervisory node's filtering function. By using a hash and a constant amount of transactions, it preserves the anonymity of vaccine manufacture. Finally, to prevent redundant information and create a stable and appropriate preservation, we suggest a cropping technique. Of course, there are still significant issues with our technique in practice. This kind of manufacturing oversight necessitates the participation of multiple stakeholders, including FDA administration and vaccine manufacturing collaboration. This type of manufacturing surveillance increases the difficulty of production technologies monitoring and may lower pertinent agencies' objectives.

NazmulAlam [9] Researchers provide a viable blockchain-based safe architecture for the healthcare distribution network amongst authorized parties in the conventional medication distribution network in this article. Our solution

uses blockchain technology to precisely and independently recognize medications, allowing a counterfeit pharmaceutical or a fraudulent supplier to be recognized quickly and simply. The design reconfigures the entire conventional pharmaceutical distribution network platform architecture, ensuring both healthcare security and vendor credibility. It also shows the current position of each operation, which improves the reliability of the system. By eliminating outdated medical data from blockchain data storage, the chain becomes more reliable and consistent.

YuliaKostyuchenko [10] Blockchain is still a new innovation that can assist with a variety of problems in medicine, particularly in the pharmaceutical sector. Implementing Blockchain technologies in the instance of counterfeit drug repurposing will minimize administrative burden while also establishing confidence, transparency, and information exchange consistency. Medicines may be validated and their validity assured using Blockchain, the data model will be safeguarded, and all stakeholders will be able to acquire and respect the information. In this article, researchers showcase some of the most prominent blockchain solutions for reducing fraudulent medicines and customer risk. Researchers also suggested possible research problems and prospects.

AnithaPremkumar [11] the report forecasts the fundamental necessity for a hand-in-hand electronic merger of Blockchain with IoT in the medical industry in the future. When it comes to supply chain operations, which are made up of a succession of interconnected although distinct occurrences, players frequently join groups to purchase information in order to acquire a better understanding of the items that would be used or ingested. Such innovations are established to accommodate to the community of stakeholders who are at the center of the difficulty with a shared resolution. This article addresses any need for Blockchain and IoT in the pharmaceutical business from a technological standpoint, as well as workable alternatives based on various usage scenarios.

III.CONCLUSION AND FUTURESCOPE

Modern existence advances beyond conventional safety and comfort, and all elements of lifestyle, including healthcare, become more complex. People who are elderly or disabled will profit the most from the groundbreaking care delivery distributions. The pharmaceutical industry is a pioneer in this strategy, since it invests time and money into creating new and improved treatments that are both better and less expensive. These pharmaceutical enterprises operate in the same way as any other business, with the magnitude of the financial market and manufacturing pushing down the cost of medications. This has the unintended consequence of requiring a large quantity of medications to be created in order to keep prices down, resulting in an excess of pharmaceuticals that are not used by the moment they expiration or are not marketed in pharmacies. NGOs and other philanthropic groups frequently provide these medications to those in need. However, there is no reliable system in place to ensure that these groups really get medicine donations. A framework for responsible drug donation is necessary for this objective, for which a thorough survey was conducted in this article for a technique that deploys the Blockchain framework which will be explained in future editions of this research.

REFERENCES

- [1] A. Kumar, D. Choudhary, M. S. Raju, D. K. Chaudhary and R. K. Sagar, "Combating Counterfeit Drugs: A quantitative analysis on cracking down the fake drug industry by using Blockchain technology," 2019 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence), (2019), pp. 174-178, doi: 10.1109/CONFLUENCE.2019.8776891.
- [2] Y. Li and Q. Ruan, "Petri Net Modeling and Analysis of the Drug Traceability System Based on Blockchain," 2021 IEEE International Conference on Consumer Electronics and Computer Engineering (ICCECE), (2021), pp. 591-595, doi: 10.1109/ICCECE51280.2021.9342402.
- [3] R. Kumar and R. Tripathi, "Traceability of counterfeit medicine supply chain through Blockchain," 2019 11th International Conference on Communication Systems & Networks (COMSNETS), (2019), pp. 568-570, doi: 10.1109/COMSNETS.2019.8711418.
- [4] M. Debe, K. Salah, R. Jayaraman and J. Arshad, "Blockchain-Based Verifiable Tracking of Resellable Returned Drugs," in IEEE Access, vol. 8, pp. 205848-205862, (2020), doi: 10.1109/ACCESS.2020.3037363.
- [5] H. M. Garcia, M. M. Cortez and E. D. Amaya, "Blockchain-based Website Solution for Controlling the Authorized Sale of Drugs in Peru," 2020 IEEE Engineering International Research Conference (EIRCON), (2020), pp. 1-4, doi: 10.1109/EIRCON51178.2020.9253764.



- [6] E. Fernando, Meyliana and Surjandy, "Blockchain Technology Implementation In Raspberry Pi For Private Network," 2019 International Conference on Sustainable Information Engineering and Technology (SIET), (2019), pp. 154-158, doi: 10.1109/SIET48054.2019.8986053.
- [7] B. Ying, W. Sun, N. R. Mohsen and A. Nayak, "A Secure Blockchain-based Prescription Drug Supply in Health-care Systems," 2019 International Conference on Smart Applications, Communications and Networking (SmartNets), (2019), pp. 1-6, doi: 10.1109/SmartNets48225.2019.9069798.
- [8] S. Peng et al., "An Efficient Double-Layer Blockchain Method for Vaccine Production Supervision," in IEEE Transactions on NanoBioscience, vol. 19, no. 3, pp. 579-587, July (2020), doi: 10.1109/TNB.2020.2999637.
- [9] N. Alam, M. R. Hasan Tanvir, S. A. Shanto, F. Israt, A. Rahman and S. Momotaj, "Blockchain Based Counterfeit Medicine Authentication System," 2021 IEEE 11th IEEE Symposium on Computer Applications & Industrial Electronics (ISCAIE), (2021), pp. 214-217, doi: 10.1109/ISCAIE51753.2021.9431789.
- [10] Y. Kostyuchenko and Q. Jiang, "Blockchain Applications to combat the global trade of falsified drugs," 2020 International Conference on Data Mining Workshops (ICDMW), (2020), pp. 890-894, doi: 10.1109/ICDMW51313.2020.00127.
- [11] A. Premkumar and C. Srimathi, "Application of Blockchain and IoT towards Pharmaceutical Industry," 2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS), (2020), pp. 729-733, doi: 10.1109/ICACCS48705.2020.9074264.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor

Impact Factor: 8.165

doi[®]
cross **ref**

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



www.ijircce.com

Scan to save the contact details