

# Blockchain based counterfeit medicine authentication

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**Abstract-** Blockchain-based drug store network the board is a progressive methodology that offers upgraded security and straightforwardness to guarantee the credibility and wellbeing of medications. Later on, a rising number of people are probably going to embrace this innovation to ensure that they get the right drugs. Blockchain, a decentralized and permanent record, is utilized to record each step of a medication's excursion through the production network. Every exchange, from the production of drugs to their dissemination, is cryptographically recorded on the blockchain. This straightforward record permits partners and shoppers to get to constant data about the medications, their beginnings, and their dealing with By giving a protected and alter safe record of a medication's set of experiences, blockchain assists purchasers and controllers with confirming the credibility of drug items. This decreases the gamble of fake or unacceptable medications entering the market. All partners, including makers, merchants, drug stores, and patients, approach similar information. This straightforwardness fabricates trust and responsibility inside the store network.

**Key Words:** Blockchain, medicine, web application



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## INTRODUCTION

Supply Chain Management (SCM) plays a pivotal role in today's globalized economy, serving as the backbone that ensures the efficient flow of goods from manufacturers to consumers. However, traditional supply chain systems often face challenges related to transparency, traceability, and security, particularly in industries where product authenticity and safety are paramount, such as pharmaceuticals. In recent years, the emergence of blockchain technology has offered a promising solution to these challenges. By incorporating blockchain into SCM, it becomes possible to revolutionize the conventional approach and establish a comprehensive system that guarantees traceability and tracking of products from their source to the hands of the consumer. This innovation not only enhances operational efficiency but also delivers numerous benefits, including safeguarding consumers, fostering trust, improving service quality, and closing loopholes that malicious actors exploit, especially in the distribution of counterfeit or substandard drugs. In this exploration, we will delve into how blockchain technology can be harnessed to transform supply chain management and address critical issues in product authenticity and safety.

## LITURATURE SURVEY

Nazmul Alam et al [1] Proposed that, For a few decades, it is a very big challenge to monitor and keep track of genuine medicine in health care. Lacking a trust system and strong monitoring authority, syndicates can make counterfeit medicine easily. With the shifting of life-critical healthcare, it becomes an emergency to ensure substandard drugs. Because counterfeit medicine has a deadly effect on the human body and has disastrous results. To detect the falsified medicine, we proposed a drug tracing system using blockchain technology. Our system is able to detect substandard and anomaly drugs from manufacturer company to patient's hand. Also can verify the defective and expired drugs in the market using smartphones by scanning

QR (Quick Response) code. Blockchain security could make the system more transparent and reliable. This paper aims to ensure drug quality, transaction security, and data safety using blockchain technology

Randhir Kumar. et all [2] The main issues with drug safety in the counterfeit medicine supply chain, are to do with how the drugs are initially manufactured. The traceability of right and active pharmaceutical ingredients during actual manufacture is a difficult process, so detecting drugs that do not contain the intended active ingredients can ultimately lead to end-consumer patient harm or even death. Blockchain's advanced features make it capable of providing a basis for complete traceability of drugs, from manufacturer to end consumer, and the ability to identify counterfeit drug. This paper aims to address the issue of drug safety using Blockchain and encrypted QR(quick response) code security.

Md. Abdullah Al Noman et all [3] Proposed that, One of the fundamental needs of humankind is medicine. Besides, counterfeit medicine is becoming more common in developing and underdeveloped countries. For this reason, false medications have a wide-ranging economic impact that affects trade, investment, and, most importantly, public health and safety. Other reasons for this wide range of fake medicines are the shortage of knowledge management, a scarcity of skillful people, a deficiency of equipment types, and less cognitive technology to detect counterfeit medicine. Many existing procedures are effective in the lab, but they are sometimes too sophisticated for inexperienced field health professionals to employ. As a result, a simple and smooth mechanism is required. The Blockchain could be able to assist in the solving of this issue. Because it handles some of the healthcare industry's long-standing is

## **PROBLEM DEFINATION**

Counterfeit medicines have emerged as a pressing and pervasive problem in the pharmaceutical industry, posing a grave threat to public health and safety. The issue centers around the manufacturing, distribution, and consumption of counterfeit drugs, which are often indistinguishable from genuine pharmaceutical products but lack the necessary efficacy and safety standards. These counterfeit medicines may contain incorrect active ingredients, incorrect dosages, or even harmful substances, putting the health and lives of unsuspecting patients at risk. The challenge lies in the complexity of the pharmaceutical supply chain, which involves multiple stakeholders, from manufacturers to wholesalers, retailers, and endusers. Counterfeit medicines can infiltrate the supply chain at any point, making it extremely difficult to trace the source of these counterfeit products. Existing authentication methods are often inadequate and lack transparency, leaving consumers and regulatory authorities in the dark about the authenticity and origins of the medicines they encounter.

The problem further escalates with the increasing globalization of pharmaceutical production and distribution. As medicines are traded across international borders, ensuring their authenticity becomes a formidable challenge. The lack of a robust and universally accepted system to track and verify medicines leaves room for counterfeiters to thrive. Consequently, there is a compelling need for an innovative solution that can address the problem at its root, offering comprehensive traceability and authentication to protect public health and safety. The Blockchain-Based Authentication System aims to provide such a solution by leveraging blockchain technology to enhance transparency, accountability, and the security of pharmaceutical products.

## **AIM & OBJECTIVES**

- To automate the process of supply chain management.
- To ensure the safety of patient by delivering safe and effective pharmaceutical drug.
- To efficient cost of transportation, inventory management and distribution.
- To achieve transparency and visibility throughout the supply chain.
- To Ensure ethical behavior and integrity includes preventing counterfeiting and corruption.
- To achieve Effectiveness in communication and collaboration between all stakeholder.

## MOTIVATION

Numerous businesses, including drugs, are dependent upon severe guidelines. Block chain can help in guaranteeing consistence by giving a straightforward and auditable record of movements of every sort and exchanges in the store network.

Integrating block chain innovation into inventory network the board can possibly upset the business by tending to a significant number of the difficulties that have endured for a really long time, including duplicating, failure, and absence of straightforwardness. This innovation offers inspiration as well as a down to earth answer for protecting shoppers, encouraging trust, upgrading administration quality, and shutting provisos took advantage of by noxious entertainers in different enterprises.

## SYSTEM ARCHITECTURE

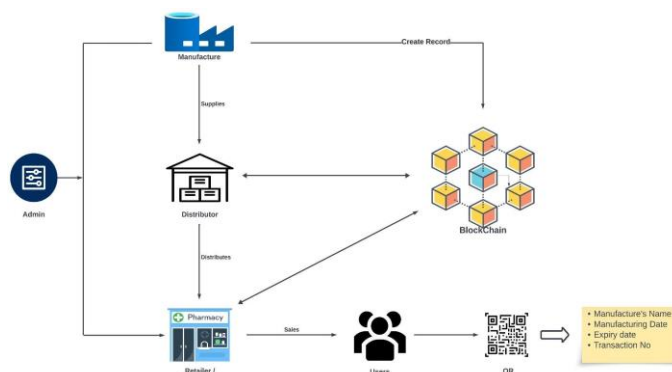


Fig -1: System Architecture Diagram

1. **Data Capture:** The system captures and encodes essential information about medicines, including batch numbers and expiry dates, into QR codes at the manufacturing stage.
2. **Distribution Tracking:** QR codes are scanned at each point in the supply chain, from manufacturers to pharmacies, allowing real-time tracking of medicine movements and ensuring authenticity.
3. **User Verification:** End-users, such as patients or healthcare providers, scan QR codes to verify the medicine's authenticity and access details about its source, enhancing safety and trust in the pharmaceutical supply chain.

## APPLICATION:

- Medicine sector
- hospital

## CONCLUSION

Block chain can help with following different guidelines and principles by giving straightforward and auditable records. This can work on the method involved with meeting administrative necessities. All in all, consolidating block chain innovation into SCM can possibly change the manner in which supply chains work. It offers further developed proficiency, wellbeing, trust, and straightforwardness, which can help all partners. Besides, it can significantly affect shielding buyers from fake or unsatisfactory items, which is particularly vital in ventures where item quality and security are principal. While there are moves and boundaries to survive, the expected advantages of block chain in SCM are significant and can prompt a safer and proficient worldwide production network biological system.

## FUTURE SCOPE

**Blockchain Integration:** Integrating blockchain technology with QR code traceability can offer even more secure and immutable records, reducing the risk of data tampering and further enhancing transparency in pharmaceutical supply chains.

**AI-Driven Analytics:** Future developments may include using artificial intelligence (AI) to analyze the vast amount of traceability data for insights into supply chain optimization, quality control, and predictive maintenance, ultimately improving efficiency and safety.

**Global Interoperability:** Standardized QR code formats and data sharing protocols could facilitate international collaboration, ensuring seamless traceability of medicines across borders, which is particularly important for global health initiatives and combating counterfeit drugs on a broader scale.

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