201_Blockchain to Overcome Counterfeiting of Medicines

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Blockchain to Overcome Counterfeiting of Medicines

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Abstract— **The production and distribution of falsified drugs, especially in developing countries, is a pressing and increasingly important global issue. The pharmaceutical duplication market estimate has crossed billions of dollars annually. The fragmented supply chain network in the pharmaceutical industry is one explanation for forging medications. Medications change possession from maker to distributor, wholesaler, and pharmacist before it arrives at the end-user. Data is not exchanged between systems, suppliers don't have an idea of what is going to happen to their products in the current supply chain environment, drugs administrative authorities have zero system perceptions, evaluation procedures are complicated and expensive, and organizations can't catch up patients. In this paper, we discussed how to use the blockchain innovation in the pharmaceutical supply chain to include traceability, accessibility, and protection in the drug processes. In the pharmaceutical industry, the proposed system will be used to track medicines from development to delivery to patients. Authorized blockchain is used to store transactions, and only trusted parties are allowed to join the system and push information to the blockchain.**

Keywords—Blockchain, pharmaceutical supply chain, falsified drugs, traceability, transparency.

I. INTRODUCTION

Drug research and development is a very complicated process that takes years to complete its journey of new medication from initial discovery to the marketplace, and it is costly as well. When the whole procedure is done, and a drug is made, the main challenge for businesses is to sell the medication in its pure form to the intended consumer and to ensure that the customer gets the genuine product that the authentic manufacturer has produced, not counterfeiters. But the current Supply Chain Management (SCM) system of the pharmaceutical industry is obsolete and doesn't provide visibility and control for manufacturers and administrative authority over drug distribution and cannot cope with the cybersecurity threats of the 21st century. This SCM situation contributes to the production, distribution, and use of counterfeit drugs. India's pharmaceutical market is the world's third-largest in terms of volume. The bad news, however, is, according to the World Health Organization (WHO), 35% of fake drugs sold all over the world emanates from India. The problem of counterfeit drugs within the supply chain costs the pharma industry billions. Another upsetting is the way that it puts patients at higher risk, particularly in developing nations where the WHO estimates that one in 10 medical products (E.g., pills, vaccines, and diagnostic kits) is substandard or fake. Every year over a million people are killed after consuming counterfeit drugs globally. In the light of its higher domestic demand and lower manufacturing costs, India is a leading global manufacturer of low-cost generic medicines Drug manufacturers struggle to find a reliable way to track the origin of these products safely, straightforwardly, and promptly; or to access information needed to fight counterfeit drug sales. The Indian government has been exploring a mechanism to ensure that all medicines manufactured and exported from India are made available in real-time. It also wants to provide patients and regulators worldwide, the means to check the validity of drugs that are manufactured in India. Another inspiration for the project is the unexplored specialized treatment in the field of medical science called 'Gene Therapy.' Patients have to provide samples of their DNA (or stem cells are withdrawn), and then the medication is made explicitly for that individual patient. But throughout that entire process, samples have to move from the patient to the drug manufacturing facility and then from the facility back to the hospital, where it is stored and finally administered. There are a lot of chances of errors with these many physically tested steps. Even right now, although there are only a handful of treatments utilizing this specific case-by-case approach, in the next five to ten years, that number will increase exponentially. Every measure of risk currently faced will only continue to develop, so a growing number of individual details

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