Adoption of Blockchain Technology to the Sri Lankan Pharmaceutical Supply Chain: An Analysis of Factors

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Counterfeit drug production and distribution is a serious and growing global problem, particularly in developing nations. The main issue with the pharmaceutical supply chain is aligned with the inability to identify the initial way it was manufactured and the subsequent transformations of its way through the supply chain before reaching the customer. Data is not always communicated between systems in the current supply chain circuit making the regulatory authorities have no visibility into the system as well as making recalls complicated and expensive. Tracing the proper and active pharmaceutical ingredients during production is challenging, thus the inability to recognize pharmaceuticals that do not contain the intended active ingredients may result in patient injury or death. Governments in several nations are now arming themselves with the latest trending technologies. The advanced capabilities of blockchain make it capable of providing a foundation for complete drug traceability from manufacturer to end customer and it has the capability to improve transparency and data security, decentralization, immutability, scalability, privacy, and visibility to detect mass production of counterfeit drugs. Blockchain can help prevent pharmaceutical drug fraud by increasing supply chain transparency. Each transaction is approved and validated by the selected peers on the blockchain framework. The Quick Response code is used to certify pharmaceuticals at each step of the supply chain. Entities in the supply chain can scan the Quick Response Code to verify the origin and quality of each product. Product ownership is kept unchanged, and each relevant logistic milestone will be recorded. It has the potential to transform the pharmaceutical supply chain. The methodology of this research is categorized into three major phases. As the first phase data is gathered from literature review and structured interviews with Blockchain experts. The results were then used as input into developing a conceptual model to evaluate the adoption of blockchain technology to the Sri Lankan pharmaceutical industry. During the second phase, a questionnaire is utilized to collect the data from the technology experts, to test the conceptual model. The sample data is obtained from technology experts in Sri Lanka to validate the conceptual model. In the final phase, key factors for the adoptability of blockchain were identified: government support, relative advantage, complexity, cost, upper management support, architecture, compatibility, and technological infrastructure. Structural equation modelling is studied to test the proposed conceptual model, and PLS-SEM was utilized to determine the validity of the proposed model. The practitioners will be able to decide on an approach for implementing blockchain in the Sri Lankan pharmaceutical supply chain by identification of these factors.

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