

# CHAPTER I

## INTRODUCTION

The Pharmaceutical distribution process in Indonesia is governed by guidelines established by the BPOM, which stands for the Pharmaceutical and Food Supervisor. These Guidelines are designed to ensure the quality and authenticity of pharmaceuticals throughout the distribution chain. Compliance with these guidelines is essential for all entities involved in the distribution process to fulfill their responsibilities. Indonesia has prioritized the pharmaceutical industry as part of its national industrial development master plan from 2015 to 2035 (RIPIN), aiming to ensure the availability of pharmaceuticals, as outlined in presidential instruction number 6 of 2016, as part of efforts to enhance healthcare service under the national health insurance system (Fernando et al., 2021). The researcher conducted a comparative analysis based on the study conducted by Erick Fernando et al., outlined in their 2021 journal titled "Blockchain Technology-Based Good Distribution Practice Model of Pharmacy Industry in Indonesia." Their inquiry examines a distribution model utilizing blockchain technology within the pharmaceutical sector, which acts as a benchmark for comparison with the present study concentrating on the pharmaceutical supply chain. Important comparisons underscore the significant expenses linked to the integration of blockchain technology, its early developmental phase characterized by uncertainties, and the vital requirement for strong data management and security protocols to ensure the integrity and immutability of data (Samundeswari et al., 2023).

Pharmaceuticals are a combination of substances that explore physiological systems or address pathologies. It plays an important role in health services by contributing to diagnosis, prevention, cure, rehabilitation, health promotion, and contraception, encompassing biological products. In addition, the healthcare industry can leverage the systematic implementation of blockchain technology to optimize patient safety and healthcare delivery quality (Suroso et al., 2021).

The pharmaceuticals field must reduce uncertainty and counterfeiting, as well as to enhance efficiency, trust, and safety in delivering pharmaceuticals to end-users (Fernando et al., 2021). Counterfeit pharmaceuticals pose significant risks to consumers, potentially causing health issues and even death. Therefore, blockchain technology offers real-time authentication to mitigate these risks (Syylim et al., n.d.). Blockchain technology is an encrypted chain of data blocks across a network that creates a "distributed ledger" (Alamsyah et al., 2023). It improves supply chain management by addressing fraud and errors, It also ensures data transparency to enhance efficiency and effectiveness through an innovative solution (Suroso et al., 2021; Vinay Reddy, 2019). It also revolutionizes pharmaceutical supply chain management by combining security and transparency, enabling decentralized networks across manufacturers, distributors, pharmacists, doctors, and patients, ensuring patient data security and collaboration (Reinhardt et al., 2020; Suroso et al., 2021).

A blockchain-based model is presented in this research, aiming to contribute to the healthcare services (Gruchmann et al., 2023; Madine et al., 2020). As well as it is becoming crucial due to its intricate nature and stakeholder involvement (Ang et al., 2021; Singh et al., 2016). Hence, the implementation of this model aims to achieve broader goals of enhancing overall well-being and meeting the diverse needs of those reliant on healthcare services (Naha Ndjurumbaha et al., 2023). This research specifically focuses on developing a pharmaceutical supply chain tracking model utilizing blockchain technology, particularly focusing on selecting the most

suitable platform among those available.

The author developed the model in this research by integrating blockchain technology within the pharmaceutical supply chain. The author innovatively integrated blockchain technology into the pharmaceutical supply chain model developed in this research. This novel approach addresses the initial issue of the lack of an effective tracking system for medications within hospital settings. The proposed innovation provides a valuable solution to assist hospitals in effectively monitoring their medications. This inventive approach utilizes blockchain technology to securely store tracking information in an unchangeable database, guaranteeing drug authenticity and improving transparency throughout the pharmaceutical supply chain. Furthermore, the model significantly improved security and accountability in pharmaceutical management (Jamil et al., 2019; Madine et al., 2020). It also enables more efficient monitoring of product quality and distribution (Bryatov & Borodinov, 2019; Kim & Laskowski, 2018). As for the structure of this research, it consisted as follows: section 1, which provides the background of the study; section 2 provides a comprehensive review of existing literature; section 3 outlines the research methodology; section 4 presents the findings and discusses their implications; and section 5 concludes with recommendations for future research endeavors.