ABSTRACT

This research attempts to implement Blockchain technology for vaccination registration services. The decentralized nature of Blockchain technology has the opportunity to overcome the complexity of these services because servers are not centered in one place. Related research on this topic is implementing a Blockchain-based e-voting system and implementing Blockchain technology on the Raspberry Pi as a private network. The study aims to determine the flow and workings of the integration system between Blockchain technology and the Ethereum Platform in implementing vaccination services and network parameters for Quality of Service (QoS) resulting from the system. The research limitation focuses on the Blockchain technology based on the Ethereum Platform, and the system network used is private.

This study uses a simulation model. Blockchain technology simulation is carried out with the Raspberry Pi microcomputer device, Radio Frequency Identification (RFID), and the Ethereum computing platform. The system is designed to integrate the Ethereum Platform, Internet of Things (RFID) devices, the Solidity programming language, and the Python programming language on the Raspberry Pi. System implementation is presented as user input process flows, vaccination registration services, and vaccination status update services.

The results of research on network attribute on QoS parameters of 65 transactions that occur on the Ethereum Platform yield an average *hash delay* of 0.33 seconds, *receipt delay* of 13.135 seconds, *hash throughput* of 2.242 MBps, *receipt throughput* of 2.022 MBps, and packet 0% loss for the whole process. This indicates that the network parameters for QoS work well on the Ethereum network.

Keywords: Vaccination Services, Blockchain, Ethereum, Raspberry Pi, Quality of Service