ABSTRACT

Vanilla is one of the most valuable commodities in the global market. The demand for vanilla in the global market continues to increase, making transparency and traceability in the supply chain a major challenge for producers, including Indonesia as the world's second largest vanilla producer but ranked seventh in terms of world vanilla exports. This final project aims to design a blockchain-based traceability application in the vanilla supply chain and analyze the estimated costs required for deployment. Smart contracts running on the Ethereum blockchain network are used to create a traceability application related to the vanilla supply chain from pollination, deposit, sorting, processing, and packaging. Application design uses the System Development Life Cycle (SDLC) waterfall model, starting from needs analysis, system design, development, testing, to implementation. The developed application successfully realizes a functional smart contract model and aligns with the vanilla supply chain business processes at Pondok Tani Migunani. Based on testing on the Sepolia testnet network, the estimated cost for smart contract deployment is 0.00652 ETH (approximately Rp. 330.984) with an average time of 23.4 seconds. Meanwhile, the estimated cost to run all functions in one business cycle is 0.00195 ETH (approximately Rp. 98.930) with a total time of 198.8 seconds. By this application, it is expected to increase the export value, transparency and traceability of Indonesian vanilla commodities, as well as support the Sustainable Development Goals (SDGs) related to responsible consumption and production.

Keywords: Blockchain, Supply Chain, Smart Contract, Transparency, Vanilla