ABSTRACT

PROTOTYPE PALM OIL LEGALITY MAPPING SYSTEM USING BLOCKCHAIN TECHNOLOGY

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Palm oil land mapping has an important role in ensuring land legality, but challenges such as data manipulation, data changes, data discrepancies, and lack of transparency are problems that are often faced. To overcome these challenges, a system that is safe and guarantees its integrity is needed. One of the proposed solutions is to integrate spatial and non-spatial data of palm oil land using blockchain technology, specifically Hyperledger Fabric. This technology allows every transaction and data change to be recorded permanently and cannot be manipulated, thus increasing transparency, trust, and traceability.This system is also equipped with IPFS (Interplanetary File System) for decentralized file storage.This research uses a descriptive method of quantitative approach with software development using Blockchain-Oriented Sofware (BOS) Development.The results show that the use of blockchain technology in the palm oil land mapping system is an effective solution to overcome the problem of data manipulation. With this technology, land legality can be ensured and mapping data is stored securely, preventing unwanted data changes or manipulation.Furthermore, the results of performance testing using Hyperledger Caliper show that in the asset creation process, throughput reaches 32.7 TPS with an average latency of 26.47 seconds. Meanwhile, in the asset reading process, the throughput reaches 248.1 TPS with an average latency of 3.30 seconds. This shows that the system has a fairly efficient and reliable performance.

Keywords: *Blockchain, Hyperledger fabric, Transparency, Trust, Traceability*