

**RANCANG BANGUN SISTEM RANTAI PASOK
INDUSTRI KULIT KAYU MANIS (*Cinnamomum
burmannii*) BERBASIS TEKNOLOGI
BLOCKCHAIN**



**FAKULTAS TEKNOLOGI PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2026**

RANCANG BANGUN SISTEM RANTAI PASOK INDUSTRI KULIT KAYU MANIS (*Cinnamomum burmannii*) BERBASIS TEKNOLOGI BLOCKCHAIN

Fauzan Aulia, Santosa, Azrifirwan

ABSTRAK

Rantai pasok kulit kayu manis melibatkan petani, pengumpul, industri pengolahan, retailer, dan konsumen dengan tantangan utama berupa pencatatan manual, keterbatasan transparansi asal usul, kesulitan menjaga konsistensi pasokan, dan lemahnya integrasi informasi antar pelaku. Penelitian ini bertujuan merancang dan mengimplementasi prototipe sistem *e-commerce* rantai pasok kulit kayu manis berbasis teknologi blockchain yang mampu meningkatkan transparansi, ketertelusuran, dan konsistensi pencatatan. Ruang lingkup penelitian berfokus pada ekosistem domestik di sekitar PT Sumatera Tropical Spices, sedangkan alur ekspor diperlakukan sebagai konteks di luar cakupan sistem digital yang dikembangkan. Metodologi mencakup analisis proses bisnis eksisting, identifikasi kebutuhan fungsional dan nonfungsional, perancangan arsitektur digital tiga lapisan, implementasi prototipe yang mengelola produk, transaksi, pergerakan stok, dan pencatatan asal usul produk secara bertingkat. Teknologi blockchain dimanfaatkan untuk menyimpan rekaman transaksi dalam bentuk nilai hash dan identitas pihak yang terlibat sebagai bukti transaksi yang sulit dimanipulasi. Hasil pengujian fungsional menunjukkan bahwa seluruh fungsi utama berjalan sesuai kebutuhan, termasuk manajemen akun, transaksi jual beli, transformasi dan agregasi produk, serta ketertelusuran produk dari berbagai sumber. Pencatatan transaksi pada blockchain meningkatkan keandalan bukti transaksi dan mendukung auditabilitas rantai pasok. Meskipun demikian, prototipe masih memiliki keterbatasan, terutama belum adanya modul pembayaran elektronik dan belum dilakukannya evaluasi dampak ekonomi di lapangan.

Kata kunci: *blockchain*, rantai pasok, kayu manis, ketertelusuran produk, sistem *e-commerce*

DESIGN AND DEVELOPMENT OF A BLOCKCHAIN BASED SUPPLY CHAIN SYSTEM FOR THE CINNAMON (*Cinnamomum Burmannii*) INDUSTRY

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ABSTRACT

The cinnamon supply chain involves farmers, collectors, processing industries, retailers, and consumers, and faces major challenges such as manual record keeping, limited transparency regarding product origin, difficulties in maintaining consistent supply, and weak information integration among actors. This research aims to design and implement a prototype of a web based commerce system for the cinnamon supply chain that integrates blockchain technology in order to improve transparency, traceability, and consistency of records. The scope of the study focuses on the domestic ecosystem around Sumatera Tropical Spices Company, while export flows are treated as contextual information outside the digital system that is developed. The methodology includes analysis of existing business processes, identification of functional and non functional requirements, the design of a three layer digital architecture, and the implementation of a prototype that manages products, transactions, stock movements, and multi level product provenance. Blockchain technology is used to store transaction records in the form of cryptographic hashes and identities of the involved parties as tamper resistant evidence. Functional testing shows that all core features operate according to requirements, including account management, commercial transactions, product transformation and aggregation, and traceability of products from multiple sources. Recording transactions on the blockchain increases the reliability of transaction evidence and supports auditability of the supply chain. Nevertheless, the prototype still has limitations, particularly the absence of an electronic payment module and the lack of economic impact evaluation in real field conditions.

Keywords: blockchain, cinnamon, e-commerce system, product traceability, supply chain