

ABSTRAK

Dimas Prayogo. 2026. Implementasi *Blockchain* Ethereum dan *InterPlanetary File System* (IPFS) untuk Sistem *File Sharing* Karya Digital Terdesentralisasi Berbasis *Website*. Skripsi. Program Studi Teknik Informatika, FT, Universitas PGRI Madiun. Pembimbing (I) Moch Yusuf Asyhari, S.Tr.Kom., M.Kom. (II) Yessi Yunitasari, S.Kom., M.Cs.

Penyimpanan karya digital pada platform konvensional saat ini masih bergantung pada *server* terpusat yang rentan terhadap risiko manipulasi metadata, kehilangan data (*single point of failure*), serta mekanisme verifikasi kepemilikan yang terbatas. Untuk mengatasi permasalahan tersebut, diperlukan sistem *file sharing* yang mampu menjamin keaslian dan integritas karya digital secara transparan dan permanen (*tamper-proof*). Tujuan penelitian ini adalah untuk merancang, membangun, dan mengimplementasikan sistem *file sharing* karya digital terdesentralisasi berbasis *website* menggunakan teknologi *Blockchain* Ethereum dan *InterPlanetary File System* (IPFS). Metode pengembangan perangkat lunak yang digunakan adalah *Test-Driven Development* (TDD) dengan tahapan *red*, *green*, dan *refactor*. Hasil penelitian menunjukkan bahwa aplikasi DecentraShare berhasil diimplementasikan menggunakan *SvelteKit* sebagai *frontend*, *Express.js* sebagai *backend*, Prisma ORM, dan PostgreSQL sebagai basis data. Seluruh *file* karya digital disimpan secara terdistribusi pada jaringan IPFS sehingga menghasilkan *Content Identifier* (CID) yang unik, sedangkan metadata dokumen berupa nilai CID, *hash* SHA-256, nama dokumen, alamat *wallet* pemilik, dan *timestamp* dicatat secara permanen pada *Blockchain* Ethereum melalui *smart contract* berbasis Solidity pada jaringan Ethereum Sepolia Testnet. Hasil pengujian menggunakan *Black Box Testing* dan *White Box Testing* menunjukkan bahwa seluruh fungsi utama sistem, mulai dari autentikasi menggunakan *MetaMask*, pengelolaan dokumen, berbagi dokumen, hingga verifikasi kepemilikan karya digital, berjalan sesuai dengan kebutuhan fungsional dan logika program, sehingga sistem mampu menyediakan layanan *file sharing* karya digital yang aman, transparan, dan terdesentralisasi.

Kata Kunci: *Blockchain*, Ethereum, IPFS, Karya Digital, *File Sharing*

ABSTRACT

Dimas Prayogo. 2026. *Implementation of Ethereum Blockchain and InterPlanetary File System (IPFS) for a Website-Based Decentralized Digital Artwork File Sharing System*. Thesis. Informatics Engineering Study Program, Faculty of Engineering, Universitas PGRI Madiun. Advisor (I) Moch Yusuf Asyhari, S.Tr.Kom., M.Kom. (II) Yessi Yunitasari, S.Kom., M.Cs.

Conventional digital artwork storage platforms still rely on centralized servers, making them vulnerable to metadata manipulation, data loss (single point of failure), and limited ownership verification mechanisms. To address these issues, a file sharing system capable of ensuring the authenticity and integrity of digital artworks in a transparent and tamper-proof manner is required. This study aims to design, develop, and implement a website-based decentralized digital artwork file sharing system using Ethereum Blockchain and the InterPlanetary File System (IPFS). The software development method employed in this study is Test-Driven Development (TDD), which consists of the red, green, and refactor stages. The results show that the DecentraShare application was successfully implemented using SvelteKit as the frontend framework, Express.js as the backend framework, Prisma ORM, and PostgreSQL as the database management system. Digital artwork files are stored in a distributed manner on the IPFS network, generating unique Content Identifiers (CID), while document metadata, including the CID, SHA-256 hash, file name, owner's wallet address, and timestamp, are permanently recorded on the Ethereum Blockchain through Solidity-based smart contracts deployed on the Ethereum Sepolia Testnet. System evaluation using Black Box Testing and White Box Testing demonstrates that all core functionalities, including MetaMask based authentication, document management, file sharing, and digital artwork ownership verification, operate according to the specified functional requirements and program logic. Therefore, the proposed system is capable of providing a secure, transparent, and decentralized digital artwork file sharing service.

Keywords: Blockchain, Ethereum, IPFS, Digital Artwork, File Sharing.