

ABSTRACT

CRYPTO LEDGER EXCHANGE DAPP

1. Introduction

CryptoLedger ExchangeDAPP 1.0 is a decentralized cryptocurrency exchange platform built on the Ethereum Sepolia Testnet. It enables users to receive, trade, and transfer CLX tokens, the platform's native ERC-20 token. This dApp enhances transparency, security, and decentralization by leveraging smart contracts, Infura, and blockchain-based authentication (MetaMask).

The platform provides a unique exchange bonus mechanism, where the deployer can define custom bonuses when users exchange crypto. Additionally, a 2% transaction fee is allocated to the developer during each token swap. Users can earn rewards by inviting friends, daily check-ins, participating in challenges, and receiving airdrops.

The developer has full control over the dApp and can manage admins and users, restricting their access if necessary. Admins can oversee platform operations, but the developer has higher priority and authority over all functionalities.

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2. Key Features & Functionalities

1 Blockchain & Smart Contracts

- ✓ **CLX Token (ERC-20):** Custom token used for trading, rewards, and platform transactions.
- ✓ **Exchange System with Developer-Defined Bonuses:** Users can trade CLX, with the deployer setting bonus amounts on exchanges.
- ✓ **2% Developer Fee:** The developer receives 2% of all transactions conducted on the platform.
- ✓ **Referral Reward System:** Users earn CLX tokens for inviting new members via referral links.
- ✓ **Token Buyback Mechanism:** The developer can periodically buy back CLX tokens to maintain token value stability.
- ✓ **Secure Transactions:** All transactions are recorded on the blockchain for transparency.

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2 Frontend (React.js & Tailwind CSS with Vite)

- ✓ User Dashboard: Displays CLX balance, transaction history, and referral earnings.
- ✓ MetaMask & WalletConnect Integration: Secure login and transactions via blockchain wallets.
- ✓ Exchange UI: Users can swap CLX for other ERC-20 tokens seamlessly.
- ✓ Portfolio Management Dashboard: Users can track all their crypto holdings on a single platform.
- ✓ Leaderboard & Challenges: Users with the most trades, referrals, or earnings get additional bonuses.
- ✓ Daily Check-in Rewards: Users earn small CLX rewards for logging in daily.

3 Backend (Node.js & Express.js with Infura & JWT Authentication)

- ✓ Authentication: Secure login via JWT-based authentication (Google Login & MetaMask Login).
- ✓ Referral Tracking: Stores referral data to ensure proper rewards distribution.
- ✓ Transaction Logging: Records all user transactions in a structured database for tracking.
- ✓ Admin & User Management:

The developer has higher authority than admins and can restrict or remove admin/user access.

Admins can manage users and platform operations but remain under developer control.

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3. Additional Features & Monetization Strategies

◆ NFT-Based Achievements & Airdrops

Users earn unique NFTs for reaching milestones (e.g., 100 trades).

Airdrops for active users based on trading volume and referrals.

◆ Premium Membership (Paid in CLX Tokens)

Users can subscribe to premium memberships for lower fees & exclusive trading features.

◆ Gamification & Engagement

Leaderboard rewards for top traders and referrers.

Time-limited trading competitions to boost engagement.

4. Technology Stack

◆ Blockchain & Smart Contracts

Ethereum Sepolia Testnet (for testing before mainnet deployment)

Solidity (ERC-20 smart contract for CLX token) Infura (for blockchain interaction) Ethers.js (for smart contract communication)

◆ Frontend

React.js + Vite (Fast UI development) Tailwind CSS (Responsive design)

MetaMask & WalletConnect (Blockchain authentication)

◆ Backend

Node.js & Express.js (API & transaction handling)

MongoDB (Storing user data, referrals, and logs)

JWT Authentication (Secure user login & sessions)

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5. Conclusion

CryptoLedger ExchangeDAPP 1.0 offers a secure, scalable, and decentralized trading platform for CLX tokens. It combines exchange bonuses, referral rewards, and NFT-based achievements to create an engaging user experience.

By leveraging Ethereum Layer 2 solutions, the platform ensures low gas fees, high transaction speed, and transparency. With a developer-controlled admin system, multi-token exchange functionality, and advanced gamification, this dApp is designed for both crypto enthusiasts and beginners.

This project lays the foundation for a trustless, incentive-driven crypto trading ecosystem with scalability and long-term sustainability.