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Cryptex: A Web-Based Platform for Secure Cryptocurrency Trading

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Abstract: This paper presents Cryptex, a web-based platform designed for secure and efficient cryptocurrency trading. The proposed system provides users with an intuitive interface to buy and sell various digital currencies while ensuring transactional security, transparency, and real-time price monitoring. Cryptex integrates web technologies with secure authentication and backend APIs to enhance trust and reliability.

Keywords: Cryptocurrency, Blockchain, Trading Platform, Web Application, Security, Digital Assets

I. INTRODUCTION

The emergence of blockchain technology has revolutionized the global financial ecosystem by enabling decentralized, transparent, and secure digital transactions. Cryptocurrencies, as a major application of blockchain, have gained significant attention among investors, developers, and financial institutions. With the growing adoption of cryptocurrencies, the need for secure, efficient, and user-friendly trading platforms has become increasingly important. However, existing cryptocurrency exchanges often suffer from vulnerabilities such as data breaches, phishing attacks, lack of transparency, and centralized control, which expose users to potential financial losses and privacy risks.

Cryptocurrency trading platforms act as intermediaries that facilitate the exchange of digital assets between users. Many of these platforms rely on centralized architectures, where sensitive user data and private keys are stored on third-party servers. This centralization not only contradicts the decentralized philosophy of blockchain but also creates a single point of failure vulnerable to cyberattacks. To overcome these challenges, secure and decentralized web-based trading platforms are essential for building user trust and promoting the sustainable growth of the crypto trading ecosystem.

II. LITERATURE REVIEW

Several platforms such as Binance, Coinbase, and WazirX have established themselves as leading crypto exchanges. However, these systems involve complex user flows and high transaction fees. Recent studies have explored integrating blockchain and AI to improve transactional transparency and predictive trading. Cryptex simplifies these processes through a lightweight web application design with enhanced accessibility.

III. METHODOLOGY

Systematic mapping aims to provide a comprehensive understanding of the current state of research on a particular topic. Through descriptive analysis, primary areas of study are identified and classified into a systematic structure (Petersen et al., 2015). As noted by Riaz et al. (2015), the distinction between Systematic mapping and literature reviews lies in the scope of the research questions (RQs) and the data analysis methods employed. The RQs in systematic mapping are redesigned to have a broader scope, with a focus on the current state of research on a particular topic, thus assisting researchers with evidence in identifying the starting point for their study. Campbell et al. (2023) suggested the aim is not to synthesise but to identify, describe, and catalogue findings. They aim to answer the questions “What do we know about a topic?”

What and where research exists in a particular area?” Our systematic mapping study strictly adhered to the methodology and framework presented by Petersen et al. (2015) and aimed to explore the existing literature on cryptocurrency trading through a series of research questions. We separated the process into three phases: (1) the research planning and preparation phase, (2) collecting and selecting relevant publications (3) describing and classifying the accepted literature (Fig. 1).

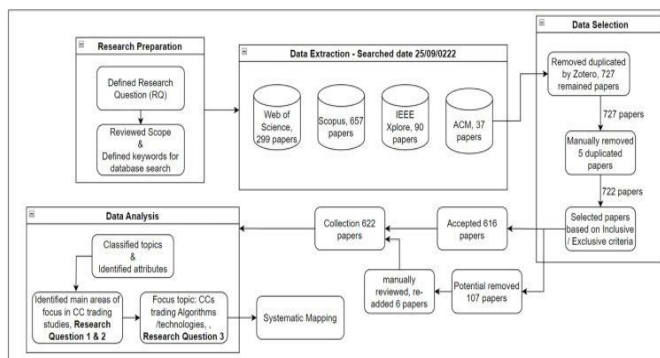


Fig.1.Mappingflowchart forcryptocurrencytradingstudy.

IV. SYSTEM DESIGN

The Cryptex system consists of three major components: Frontend,Backend,andDatabase.Thefrontendisdeveloped usingHTML,CSS,andJavaScriptforaninteractiveuserexperience.Thebackendmanagesuserauthentication,wallet management, and transaction execution.

1) Frontend Module

The frontend provides a clean and intuitive design for user registration, login, and crypto trading. Users can view price charts, trading pairs, and portfolio summaries.

2) Backend Module

The backend handles user authentication, order processing, and secure transaction management using RESTful APIs. It also integrateserrorhandlingandsessionmanagementforreliability.

3) Database Module

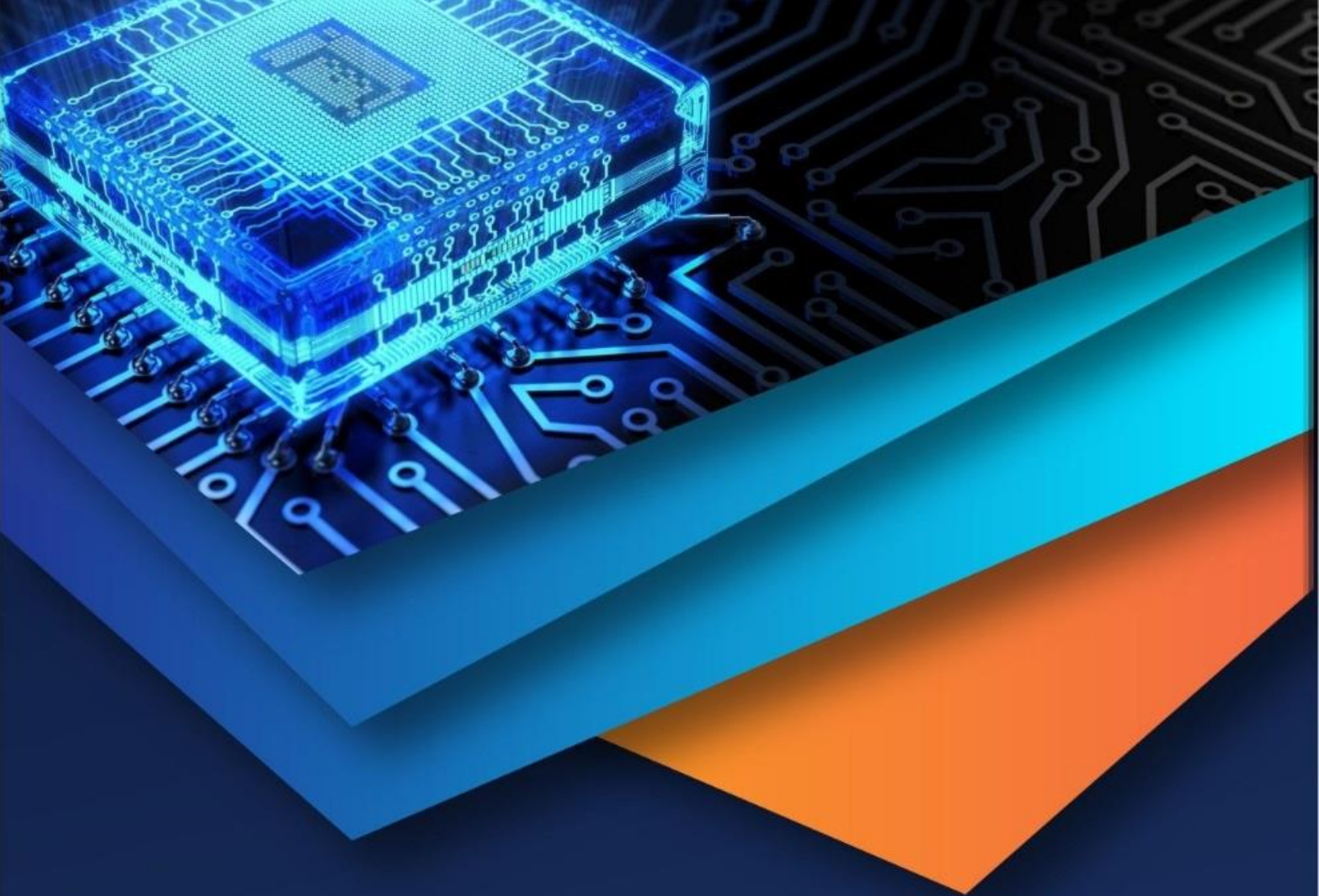
MySQL or MongoDB is used for secure storage of user and transaction data. Data encryption ensures protection of sensitive information.

V. CONCLUSION

The rapid growth of cryptocurrencies and blockchain-based financialsystemshashighlightedthecriticalneedforsecureand transparent trading environments. This research introduced Cryptex,a web-basedplatformforsecurecryptocurrencytrading, designedtoaddressthemajorchallengesassociatedwithexisting centralized exchanges, including security vulnerabilities, data breaches, and lack of transparency. The system emphasizes user security through the integration of encryption algorithms, multi- factor authentication, and blockchain verification techniques.

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