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Optimizing Cryptocurrency Portfolio Management through Innovative Tracker

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ABSTRACT

Cryptocurrency, or crypto, is a form of currency used for digitally secure transactions using cryptography. Cryptocurrency does not have any central regulatory authorities. It works on decentralized systems to record transactions and issue new units. Cryptocurrency is a digital payment system where transactions are verified and maintained by a decentralized system and do not need any authorization from the bank for digital entries. They are stored in digital wallets and a public ledger records the transactions Cryptocurrency is derived from the word encryption, the term used for verifying the transactions. The purpose of encryption is to provide a safe and secure way to transact payments or any other form of data.

The transaction of the data takes place between the wallets and the public ledger. A Public ledger is a distributed system which is known as Blockchain, that is responsible for the records of the transactions and updating it. Computers generate cryptocurrency coins through complicated mathematical operations. The process in which these units of cryptocurrencies are called mining. The user of the coin just owns a key that allows the transaction of the records in the database. The most popular are bitcoin, ethereum, litecoin, ripple, namecoin, peercoin, etc.[3,4]

Keywords : Cryptocurrency, Ethereum, Litecoin, Ripple, Namecoin, Peercoin

I. INTRODUCTION

There will be more than 420 million active users of cryptocurrency in 2024. The total market of cryptocurrency is approximately $1.32 trillion, with $172 billion every hour. According to statistics, 8% of the US population uses cryptocurrency. Most cryptocurrency users are from Asia, which is four times more than any other continent. Due to the large availability of cryptocurrencies, it is very difficult for investors to track their investments.[26,27] Tracker is developed as a portfolio tracker for cryptocurrency where investors can track the value of their investments. Advanced web development technologies help in creating applications like cryptocurrency portfolio trackers. One of the core facilities of Cryptocurrency portfolio trackers.

II. RESPONSIVE DESIGN

The cryptocurrency portfolio tracker uses responsive web design principles to ensure compatibility across various devices and screen sizes with the help of CSS Grid and Flexbox. For example, desktops, laptops, tablets, or smartphones.[10,11]

Real-Time Data Integration: Due to the high demand for cryptocurrency, it is very important to display real-time data to users. For this, trackers use APIs to provide up-to-date information on pricing, market trends, and portfolio performance. [25,26]

Interactive Charts and Graphs: Cryptocurrency portfolio trackers use visual representations to simplify complex data. Using advanced charting libraries like D3.js or Chart.js to generate graphs and charts to help the user analyze price movements, compare assets, and identify patterns.

Personalized Dashboards: Cryptocurrency portfolio trackers use personalized dashboards to fulfill users' preferences. It is used to customize the preferences according to investors. It allows users to customize components such as price tickets, and portfolio summaries, and to create personalized dashboards that suit their investments and interests.

2.1 Features and Technologies

Python: Python serves as a robust language for the backend language in cryptocurrency portfolio tracking consisting of extensive libraries for data manipulation and aggregation. In this project, it is used for the authentication and authorization of the user data and to protect the data from external access.[9,10]

ReactJS: React is a framework that employs Webpack to automatically compile React, JSX, and ES6 code while handling CSS file prefixes. ReactJS is a free and open-source library of Javascript and is used as a frontend component.[23,24]

Tailwind CSS: Tailwind CSS is a utility-first CSS framework that allows you to quickly create bespoke user interfaces. It's a highly configurable, low-level CSS framework that gives you all the building blocks necessary to customize designs easily.[24,25]

Javascript: JavaScript is used to fetch data from the CoinGecko API, and asynchronous JavaScript is used. The data is fetched from the backend and is displayed on the webpage.[6,7]

CoinGecko API: CoinGecko is one of the safest and most comprehensive cryptocurrency APIs for investors and developers. It aggregates data from over 13,000+ cryptocurrencies and over 1,000+ crypto exchanges. It is a top-notch and 99.9% uptime crypto API available on the internet that functions 24x7, with more than 70 endpoints[4,5].

PostgreSQL for databases: PostgreSQL is a relational database management system that focuses on flexibility and SQL conformance. Many web, mobile, geospatial, and analytics applications use PostgreSQL as their primary data storage or data warehouse.[22,23]

Reliability and Uptime: CoinGecko API is renowned for its reliability and robust infrastructure, boasting a 99.9% uptime guarantee to ensure uninterrupted access to cryptocurrency data and services. This research paper will also enlighten the potential benefits of the cryptocurrency portfolio tracker for investors, traders, researchers, and cryptocurrency enthusiasts.[21,22]

2.2 What is a Cryptocurrency Portfolio Tracker?

Cryptocurrency is a centralized hub where users can view their digital assets and track their performance. Trackers provide insights into investors' performance,

using features such as portfolio valuation, showing the current value holdings with other cryptocurrencies, asset allocation, analyzing historical performance, and many more. By visualizing data through charts, graphs, and customizable dashboards, investors and users can gain a better understanding of how their investments are performing and figure out the area of the performance.[11,12]

2.3 How Cryptocurrency Portfolio Trackers Work?

Initially, trackers require data input from a source. The trackers access these data using APIs or other third-party services. The data can be either a cryptocurrency exchange or a wallet. The aggregated data is collected, processed, and presented to users in a coherent and actionable format. Cryptocurrency portfolio trackers use a manual approach where users can manually fill out the cryptocurrency transactions. The user-inputted data provides a personalizing portfolio tracking experience. Users can put details of their transactions, selling and buying orders, and asset acquisitions into the tracker. Some trackers use external sources like CSV format to enhance flexibility and convenience. Other trackers use third-party services like APIs to provide automatic generation to monitor the asset performance. This enables automatic integration with exchanges and wallets, allowing investors to smoothly upload their transaction data.

Once all the data is consolidated, the tracker initiates its work to monitor the process. By aggregating data across different trading pairs and markets, it offers a comprehensive view to the users of their holdings. Trackers maintain a detailed record of all the transactions conducted by the users and generate a transaction report. Transaction reports allow users to create customizable reports, summarizing the portfolio performance. These reports include several metrics like total portfolio value, profits and losses, transactions, and tax-related information. Users can extract this information in different formats like PDFs or CSVs.[12,13]

2.4 Challenges

Security is the major concern in the portfolio trackers. To protect data against breaches and unauthorized access, robust measures are necessary, including the integration of encryption, multi-factor authentication, and regular security checks to protect the data.

The requirement of data privacy and terms of compliance is also necessary. To make sure of compliance, such as anti-money laundering and know-your-customer regulations, along with maintaining user privacy and data security is necessary for cryptocurrency portfolio trackers.

Maintaining up-to-date and accurate portfolio information requires continuous monitoring and synchronization across multiple exchanges and wallets. However, technical issues such as latency and synchronization errors can lead to delays or discrepancies in price updates, undermining the reliability of portfolio trackers.

III.LITERATURE REVIEW

Chamath Palihapitiya, a prominent venture capitalist, and CEO of Social Capital, in early 2022, emphasized the importance of data-driven decision-making in cryptocurrency investments and mentioned the analytics provided by the portfolio trackers by integrating advanced features such as artificial intelligence and advanced machine learning algorithms[2,3]

At the Cryptocurrency Conference 2023, Cathie Wood, the CEO of ARK Wood, shared her vision for the future of cryptocurrency portfolio trackers. She highlighted the potential of Blockchain technology to revolutionize portfolio trackers, citing the

transparency, immutability, and security features of the distributed ledger technology.[13,14]

Smith et al. (2020) conducted a comprehensive comparative analysis of various crypto portfolio tracking applications, identifying key features that contribute to their effectiveness. Among these features, real-time price updates, customizable portfolio views, and performance analytics were highlighted as essential components.[14,15]

Jones and Patel (2019) observed that integrated tracking solutions enable users to consolidate their holdings from various exchanges and wallets into a single platform. This integration enhances convenience by providing a centralized location for managing and monitoring all crypto assets, streamlining portfolio management processes.[15,16]

Privacy and security are additional concerns associated with crypto portfolio trackers. Lee et al. (2019) highlighted vulnerabilities in the security practices of certain tracking applications, raising concerns about the safety of user data and assets. The storage and sharing of sensitive financial information on tracking platforms pose risks, including data breaches and unauthorized access.

IV. RELATED WORK

Coinstats is a dedicated cryptocurrency portfolio tracker that offers portfolio management and seamless integration of over 300 crypto exchanges, blockchains, and wallets like Metamask. Coinstats has over 8000+ digital assets to view in real-time. It uses military-grade encryption for data protection.[16,17]

Koinly is software that offers a tax-compliant monitoring platform for cryptocurrency users. This platform enables users to consolidate their crypto assets in one space and provide an overview of their holdings. It offers intensive crypto exchanges and also supports 80+ crypto wallets and 150+ blockchains.[17,18]

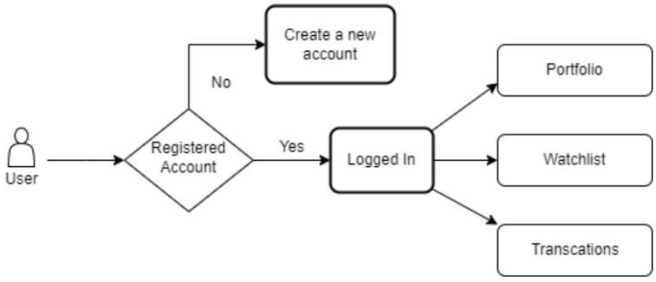
Kubera is the first personal balance sheet software and cryptocurrency portfolio tracker. It automatically generates over 120+ cryptocurrency exchange values. It is available both for mobile and web versions.[5,6]

V. METHODOLOGY

In developing a Cryptocurrency Portfolio, we have to focus on backend development. It includes setting up a database that stores information about the various cryptocurrencies. [7,8] The backend code includes functionalities of real-time update, data storage, and retrieval. The authentication system is also stored in the backend which provides security to the users to keep their assets safe and secure within the portfolio trackers system. User Interface design is also very crucial when developing a project, especially the products that involve high-quality visualization of the data. Developers develop intuitive and visually appealing interfaces for the users which are user-friendly. APIs serve as intermediaries that facilitate data exchange between software applications here and portfolio trackers. APIs access data from various sources and provide standardized methods for retrieving, updating, and analyzing data, and streamlining the information within the portfolio trackers to get real-time data.[20,21]

VI. IMPLEMENTATION

In the implementation, we have worked on three areas: Portfolio, transaction, and watchlist.



6.1 Portfolio

The portfolio tracks a client's cryptocurrency possessions and portfolio value based on current market changes. It gives the simplicity of surveying

Your crypto possessions from one dashboard in only several ticks. A user can see the ups and downs of their cryptocurrencies through the portfolio. Users can also have updates on crypto price fluctuations. They can comparatively have an analysis of the performance of the coins.[8,9]

Fig. 2. Transactions Page

6.2 Transaction

Crypto transactions follow similar schematics of some other kind of advanced or online exchange. Monetary standards are moved to start with one companion and then onto the next utilizing programming. The product is known as digital currency wallets or crypto wallets. One must realize the private key expected to start the exchange.[18,19]

6.3 Watchlist

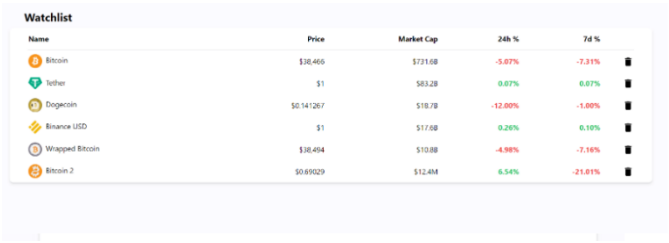


Fig. 3. Watchlist

6.1 Portfolio

Watchlist is a site included in digital currency trades. In this site aspect, clients are provided the capacity to create their rundown of advanced tokens that they would need to follow. This might be an internal page that a client had chosen to screen changes in the crypto token's cost, esteem, and subsequent coin rank. There are various digital money trades or sites that utilize its threats so that the crypto merchant would be capable of reliably keeping and showing their watchlist. These sites just permit that the watchlist be reserved and gotten to through the actual site or the gadget utilized by the person who made it.[19,20]

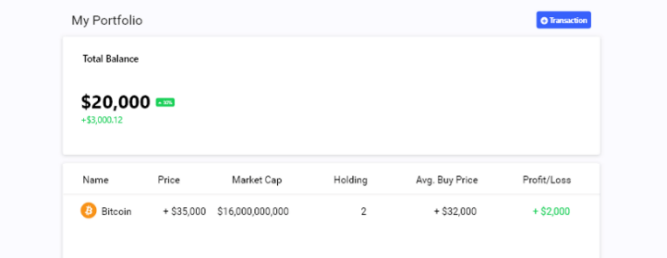


Fig. 4. My Portfolio Page

VII. RESULT

The Crypto Portfolio Tracker stands as a beacon of innovation in the realm of cryptocurrency portfolio management, addressing the pressing need for investors to effectively monitor and manage their digital assets. The platform provides users with a sophisticated yet user-friendly interface, empowering them to make informed decisions in the fast-paced world of digital finance. The platform's emphasis on security is evident through its implementation of robust authentication mechanisms and encryption protocols. By safeguarding user data and funds against unauthorized access. Despite its strengths, the Crypto Portfolio Tracker is not without its challenges. Data accuracy, platform stability, and regulatory compliance remain areas of concern that require continuous monitoring and refinement. However, through diligent testing and ongoing updates, therefore endeavor to overcome these challenges and deliver an unparalleled user experience.

VIII. FUTURE SCOPE

News Section: This specialized feature will allow users to get the latest and updated information about cryptocurrency and investment news. The latest trends,

new coin listings, industry events, and market news, will be available to the users on one platform.

Email alert functionality: Email alerts will allow users to customize their preferences and receive personalized notifications regarding the assets. The email alert will provide timely information to the investors to make informed decisions.

Mobile application development: The Mobile app of the portfolio tracker will offer users a convenient and accessible way to monitor investments and stay informed about the cryptocurrency market.

Social and Community Features: Integrating social and community features into portfolio tracker websites will enhance collaboration and knowledge sharing among users including features such as social trading, community forums, peer-to-peer messaging, and many more.

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