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Implementation of Crypto Tracking System for Accurate and Effective Tracking Capabilities

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Abstract. A crypto tracking system is a software application designed to monitor and track transactions involving cryptocurrencies. The system provides users with real-time data on the movement of cryptocurrencies across different blockchains and wallets. The system gathers data from several sources, including blockchain explorers, exchange APIs, and trading platforms. After gathering the data, it undergoes processing and analysis through machine learning algorithms, yielding valuable insights into market trends, trading behaviors, and pertinent information. Users of the system can customize their dashboard to display the information most relevant to their needs, such as portfolio performance, price alerts, and transaction history. The system also provides various tools inorder to manage cryptocurrency holdings, including the ability to transfer funds between wallets and execute trades on exchanges. Overall, a cryptocurrency tracking system offers users a holistic perspective of the cryptocurrency market and their personal cryptocurrency investments, empowering them to make well-informed choices regarding the acquisition, disposal, and exchange of cryptocurrencies.Keywords: Cryptocurrency, Crypto tracking system, Blockchain, Real-time data.

1.   Introduction

The main purpose of a crypto tracking system is to increase transparency, security, and trust in the cryptocurrency ecosystem. These systems can help prevent fraud and illegal activities such as money laundering and terrorist financing. They can also assist in tax compliance by providing accurate records of cryptocurrency transactions. Crypto tracking systems typically use blockchain technology to track transactions and provide real-time information to users. Some systems also offer features such as automatic portfolio rebalancing, tax reporting, and alerts for price changes. These systems played an important role in the success of e-commerce platforms such as Amazon, Walmart, eBay, etc. Some crypto tracking systems are designed for individual use, while others are geared towards institutional clients such as banks and exchanges. These systems can range from simple web-based tools to more advanced software platforms with sophisticated analytics and reporting features [1].

Security is a crucial aspect of a crypto tracking system. The system employs encryption and other security measures to protect user data and prevent unauthorized access to accounts. It also uses multi-factor authentication and other security protocols to ensure that only authorized users can access the system. These systems are very secure and can be complex, we can explain this using graph theory by this we can track criminals and find out if they are from criminal organizations [2].

2.   Literature Review

Crypto tracking systems are tools used to monitor and analyze cryptocurrency transactions. They have become increasingly important in recent years, as cryptocurrencies have

gained popularity and have been used for illicit activities such as money laundering and terrorism financing. Here are some key papers that have been published on the topic of crypto tracking systems.

"Cryptocurrency trading: a comprehensive survey", by Fang, F., Ventre, C., Basios, M. et al. (2022). This paper provides research and analysis on crypto trading, it provides the basic understanding of current state of crypto trading and what are the different ways of perceiving it [3].

"A Model for Detecting Cryptocurrency Transactions with Discernible Purpose", by H. Baek (2019). This paper provides an overview of cryptocurrency forensics, including tracking tools and techniques. The authors also discuss the legal and ethical implications of using these tools for law enforcement purposes [4].

"Cryptocurrency-An Overview", by Wisetsri, Worakamol & Vijai,C. & Kasidit, & Chueinwittaya, Kasidit & Jirayus, Puttithorn (2022). This paper proposes a systematic approach for analyzing cryptocurrencies, including extracting and analyzing data from the blockchain. The authors also discuss the limitations of crypto currencies and suggest areas for further research [5].

"Financial Technologies for Accepting Transaction Using Cryptocurrency", by S. Suhaimi, L. Y. Hui, N. B. Shafee, H. Hashim, S. N. Huda and M. Mohd Azlishah Othman (2022). This paper provides an overview of cryptocurrency transactions and differerent challenges or dilemmas investors might face while investing in these currencies [6].

"Enhancing Bitcoin Security and Performance with Strong Consistency via Collective Signing", by X. Zhang, Y. Xiang, J. Liu, and X. Chen (2019). This paper proposes a new approach to tracking bitcoin transactions that relies on collective signing, a technique that ensures strong consistency and improves performance. The authors argue that this approach could be useful for both law enforcement and commercial applications [7].

Overall, these papers demonstrate the growing interest in crypto tracking systems and the need for more research to improve their effectiveness and address the legal and ethical implications of their use.

3. Applications of Crypto Tracking System

- *Detection of Illicit Activities:* One of the main goals of crypto tracking systems is to detect and prevent illicit activities, such as money laundering, terrorism financing, or drug trafficking. By analyzing transaction data and identifying suspicious patterns, such systems can help law enforcement agencies target their investigations and take action to disrupt criminal networks [8].

- *Improved Regulatory Compliance:* For businesses operating in the cryptocurrency industry, crypto tracking systems can help ensure compliance with regulatory requirements, such as anti-money laundering (AML) and know-your-customer (KYC) rules. By monitoring transactions and identifying high-risk activities, businesses can take steps to mitigate potential risks and avoid regulatory penalties [9].

- *Enhanced Transparency:* The use of blockchain technology in crypto tracking systems can help increase transparency in the cryptocurrency industry. By providing a publicly accessible record of transactions, such systems can help build trust and accountability among users and stakeholders.

- *Identification of Market Trends:* Through the examination of transaction data, cryptocurrency tracking systems can offer valuable insights into market trends and behavior. Such insights are invaluable for businesses and investors seeking to make educated decisions about their cryptocurrency investments, as well as for researchers delving into the cryptocurrency landscape.

- *Prevention of Fraud:* Crypto tracking systems can also help prevent fraud by identifying and flagging suspicious transactions, such as those involving counterfeit or stolen cryptocurrency [10].

4.   Implementation of Crypto Tracking System

The deployment of cryptocurrency tracking systems may differ depending on the particular system and its intended purpose. Nevertheless, there are common steps typically involved in the implementation process. The first step in implementing a crypto tracking system is to clearly define its purpose. This may involve identifying the types of cryptocurrency transactions that will be tracked, the level of detail needed, and the desired outcomes. The purpose of this project is to educate or provide knowledge to the user about cryptocurrencies and help them manage their crypto portfolio.

Tracking tools and algorithms are developed to extract relevant data from the internet using coingecko Api [11].We use coingecko api to retrieve data which updates every 24 hours of different crypto currencies to compare and display.

Subsequently, the data is subjected to analysis through a range of mathematical techniques to uncover patterns and trends within cryptocurrency transactions, and this information is presented through data visualization using diverse gecko features. We can see the data flow in the system using Figure 1.
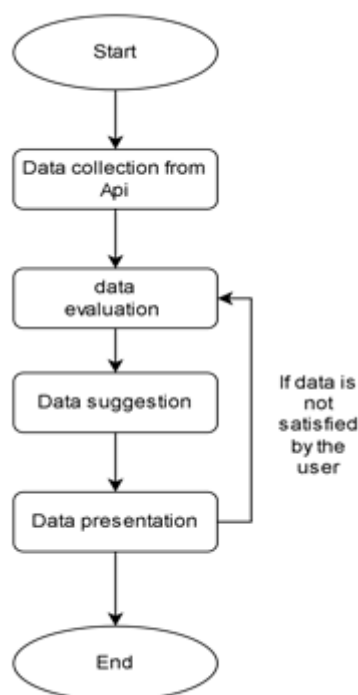

Figure 1 Data Flowchart

Once the tracking system has been developed and validated, it can be deployed for use. The website creation is done using node js,react. Crypto tracking systems must be regularly

maintained and updated to keep up with changes in the cryptocurrency landscape and ensure that they continue to provide accurate and effective tracking capabilities [12].
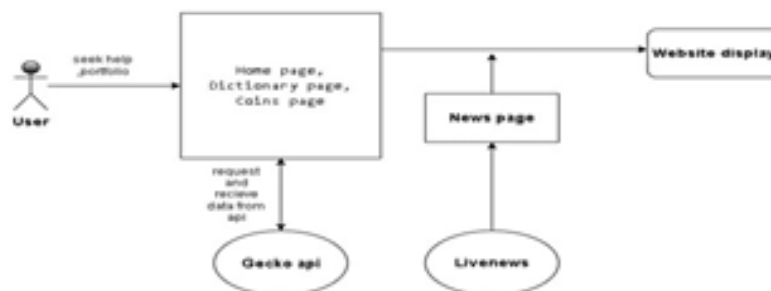
Figure 2 Design Model of Crypto Tracking System

The design model of crypto tracking system is depicted in Figure 2. Overall, the implementation of crypto tracking systems is a complex process that requires significant expertise in cryptography, computer science, and data analysis [13].

5. Advantages of Crypto Tracking System

A crypto tracking system offers several advantages to users, including:

- *Real-time monitoring:* The system provides real-time data on cryptocurrency transactions, enabling users to stay up-to- date on market movements and quickly react to changes in market conditions [14].

- *Comprehensive data analysis:* A cryptocurrency tracking system gathers data from a variety of sources, encompassing blockchain explorers, exchange APIs, and trading platforms. It employs machine learning algorithms to scrutinize this data, furnishing users with valuable insights into market trends, trading behaviors, and pertinent information.

- *Personal investment:* From Studies we have found that adding a cryptocurrency to a persons investment routine have consistently been an optimal portfolio and has given a good return [15].

- *Security:* A crypto tracking system employs encryption and other security measures to protect user data and prevent unauthorized access to accounts. This ensures that users' cryptocurrency holdings are safe and secure [16].

- *Decentralized and Cheap transactions:* Being a currency which is programmable it serves a great opportunity for decentralized autonomous organizations to grow. And it also helps users to do transactions with low transactional costs [17].

- *Time-saving:* A crypto tracking system automates the process of tracking cryptocurrency transactions and provides users with easy access to information in one place. This saves users time and effort in managing their cryptocurrency holdings [19].

Overall, a crypto tracking system offers significant advantages to users by providing real-time monitoring, comprehensive data analysis, customization, security, portfolio management tools, and time-saving benefits.

6. Disadvantages of Crypto Tracking System

- *Privacy Concerns:* One of the main concerns with crypto tracking systems is the potential invasion of privacy. The use of blockchain technology ensures that transactions are immutable and transparent, but this also means that personal information may be exposed. This is especially concerning in cases where the system is used for law enforcement purposes and can result in individuals being unfairly targeted or stigmatized.

- *False Positives:* Crypto tracking systems are not perfect and may generate false positives, resulting in innocent parties being mistakenly accused or investigated. This can cause significant harm to individuals and may erode trust in the system.

- *Difficulty in Tracking Transactions:* Despite the transparency of blockchain technology, it can be challenging to track cryptocurrency transactions effectively. This is especially true for privacy-focused cryptocurrencies such as Monero and Zcash, which use advanced encryption techniques to ensure anonymity.

- *Cost and Complexity:* Establishing a cryptocurrency tracking system demands substantial resources, including financial investments and technical expertise. This can pose a noteworthy hurdle, especially for smaller law enforcement agencies or startups.

- *Risk of Exploitation:* Crypto tracking systems may also be vulnerable to exploitation by bad actors, such as hackers or malicious insiders. The use of sensitive data in such systems requires robust security measures to protect against unauthorized access or data breaches. User might also be vulnerable to fake advertisements which might cause a huge scale scam by entrepreneurs and social media influencers [19].

- *Technical expertise:* To use a crypto tracking system effectively, users need to have some technical expertise in cryptocurrency and blockchain technology. Users who are not familiar with these concepts may find it difficult to understand and use the system effectively.

- *Reliance on data sources:* A crypto tracking system relies on data from various sources, including blockchain explorers, exchange APIs, and trading platforms. If any of these sources have incorrect or incomplete data, it can negatively impact the accuracy of the system's analysis.

7.   Results

The result is in the form of a website which can be accessed by web users to learn about cryptocurrencies and manage their portfolio to the best of their interest.
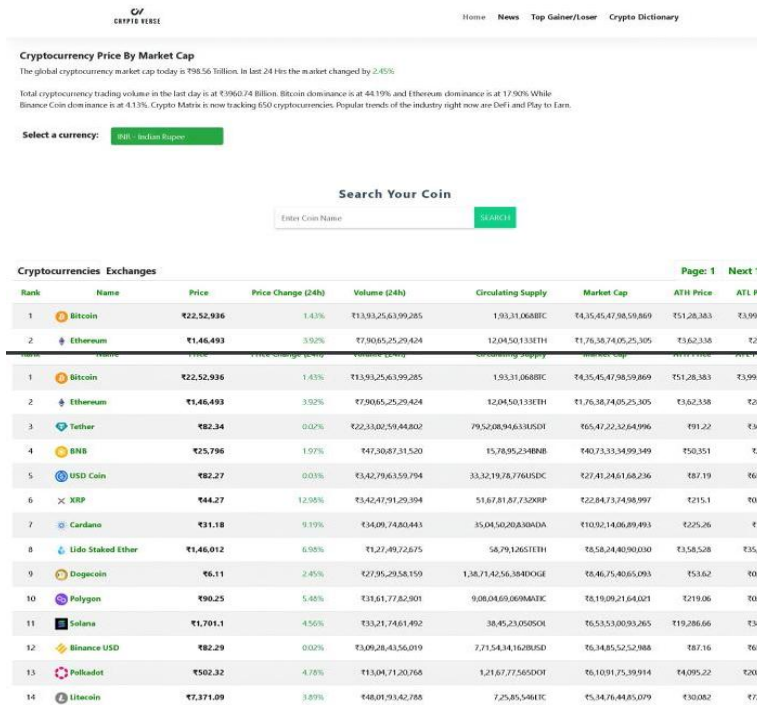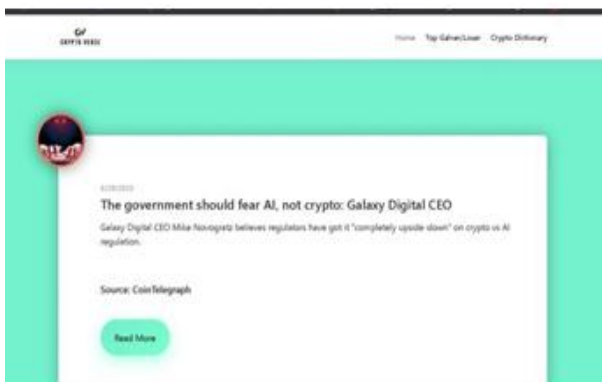
Figure 3 Home Page

Figure 4 News Page
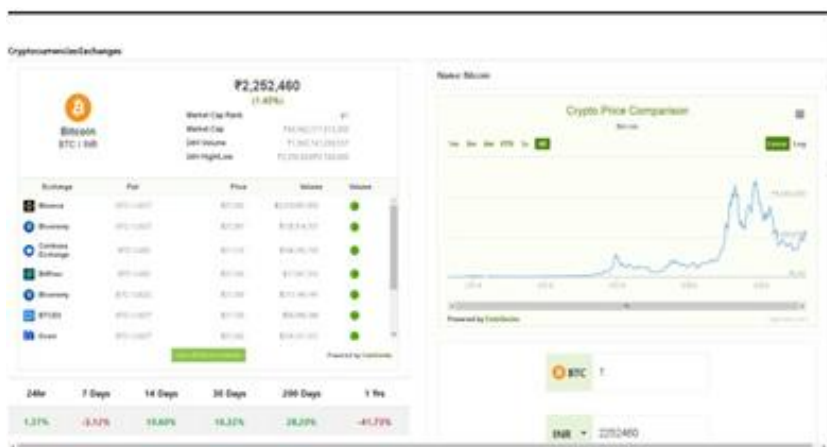

Figure 5 Dictionary Page

Figure 6 Cryptocurrency Page

8. Future Scope

Although cryptocurrencies had seen massive growth in recent years, they are still widely considered to be in their inception of the growth. Some analysts also might call crypto currencies as the future of global currencies. These are some of the possible areas of research which still needs to be done.

Long- and Short-term trading research: There is a significant difference in long term and short-term trading of crypto currencies. The risk increases as the horizon of the time increases but the investor can also obtain high profit for it. So, it is important to control the risk and invest accordingly.

Correlation between cryptocurrencies and others: Cryptocurrencies and normal currencies are both forms of currency, but there are some key differences between them. Crypto currencies are decentralized and operate on a blockchain network, while normal currencies are centralized and backed by a government. Cryptocurrencies are not issued or controlled by any central authority or government, which means they are not subject to the same regulations and restrictions as normal currencies. Another difference is that cryptocurrencies are often more volatile than normal currencies. This is because the value of cryptocurrencies is determined by supply and demand on cryptocurrency exchanges, which can be highly influenced by speculation and market sentiment. Normal currencies, on the other hand, are typically more stable in value and subject to government policies and economic indicators.

9.   Conclusion

Crypto tracking systems have the potential to provide significant benefits in terms of detecting illicit activities, improving regulatory compliance, enhancing transparency, identifying market trends, and preventing fraud in the cryptocurrency industry. However, the implementation of such systems must be carefully considered to ensure that they are ethical, responsible, and effective. Privacy concerns, false positives, difficulty in tracking transactions, cost and complexity, and the risk of exploitation are some of the main disadvantages of crypto tracking systems that must be taken into account. It is crucial to establish and maintain suitable safeguards to safeguard individual privacy and mitigate the potential misuse of sensitive data. In sum, cryptocurrency tracking systems can serve a pivotal function in upholding the integrity and security of the cryptocurrency industry. Nevertheless, ongoing evaluation and refinement of these systems are essential to ensure their continued effectiveness and adaptability to the evolving realm of cryptocurrency transactions and applications.

Cryptocurrency tracking systems have gained increasing significance in upholding the security and transparency of the cryptocurrency industry. Leveraging blockchain technology, these systems are designed to monitor cryptocurrency transactions, identify illicit activities, enhance regulatory compliance, and thwart fraudulent activities. However, the implementation of such systems poses several challenges, encompassing concerns about privacy, false positives, transaction tracking difficulties, cost and complexity, and the potential for exploitation. It is imperative to establish appropriate safeguards to protect individual privacy and mitigate the misuse of sensitive data. On balance, the benefits of cryptocurrency tracking systems outweigh their drawbacks, as they play a pivotal role in upholding the integrity and security of the cryptocurrency industry. Sustained research and development efforts in this domain will be necessary to refine and enhance these systems, ensuring their ongoing effectiveness and adaptability to the evolving demands of the cryptocurrency landscape.

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