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8. **Abstract [PURPOSE-METHODOLOGY-FINDINGS]**
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    Chapter-3: Requirement Artifacts

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    Chapter-5: Technical Implementations and Analysis

    Chapter-6: Project Outcome and Applicability

    Chapter-7: Conclusions and Recommendation

    References

    Appendices (Additional Information if necessary).

[Report should be in A4 size paper with flexible cover]

CRYPTOWATCH

(A way to get insights about a Crypto-Token for better Investment)

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

Of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

SCHOOL OF COMPUTING SCIENCE AND ENGINEERING

VIT BHOPAL UNIVERSITY

KOTHRIKALAN, SEHORE
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April 2023

BONAFIDE CERTIFICATE

Certified that this project report titled **"CRYPTOWATCH"** is the bonafide work of "**Abhijeet Chatterjee (19BCE10021), Raj Aryan (19BCE10421), Soumyadip Majumdar (19BCE10206), Aniket Mishra (19BCE10385)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported at this time does not form part of any other project/research work based on which a degree or award was conferred on an earlier occasion on this or any other candidate.

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The Project Exhibition I Examination is held on _____

ACKNOWLEDGEMENT

First and foremost I would like to thank the Lord Almighty for His presence and immense blessing throughout the project work.

I wish to express my heartfelt gratitude to Dr……., Head of the Department, School of Computer Science and Engineering for much of his valuable support encouragement in carrying out this work.

I would like to thank my internal guide **Mr. Venkat Prasad Padhy**, for continually guiding and actively participating in my project, giving valuable suggestions to complete the project work.

I would like to thank all the technical and teaching staff of the School of Aeronautical Science, who extended directly or indirectly all support.

Last, but not least, I am deeply indebted to my parents who have been the greatest support while I worked day and night for the project to make it a success.

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SPECIMEN

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RELATED WORK INVESTIGATION

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Boix et al (1995) used the vectorial model to assess the influence of local breeze and other meteorological parameters on the ground level concentrations of SO_2 and particulate matters in the urban area of Castellon-Spain. They reported a decrease in the concentrations of SO_2 and particulate matters in winter months due to strong prevailing wind while measured concentrations in summer were higher than recorded in winter months.

Seiber et al (1996) estimated flux values using the ISCST3 model and compared with CALPUFF for airborne methyl bromide downwind of a treated agricultural field. The ISCST3 model, under predicted concentrations for 76% of data while the CALPUFF model also under predicted 67% of observations.

Yates et al (1996) also estimated the flux values and observed that ISCST3 model over-predicted concentrations by a factor of 2 for 67% of data and the CALPUFF over-predicted concentrations by a factor of 1.6 for over 50% of data.

Anh, et al (1998) present a generic reaction set (GRS) model which offers a convenient framework for studying the photochemical smog production. The performance of the model has been found comparable to more detailed photo chemical mechanisms such as the CBM – IV. The presentation also discusses about the GRS model expansion to include spatial advection and diffusion in the airshed. The expanded model is implemented on a simple grid of seven stations in the Sydney monitoring network. Comparison with observed data indicates that the model performs quite well; in particular, it traces the ozone episodes accurately.

CHAPTER 1 - PROJECT DESCRIPTION AND OUTLINE

1.1 - Introduction:

Crypto-trading, the practice of buying and selling cryptocurrencies, has seen a significant rise in popularity among new-generation investors in recent years. The advent of blockchain technology and the growing acceptance of cryptocurrencies as a legitimate asset class have made it easier for individuals to invest in cryptocurrencies. Unlike traditional stock markets, which operate during specific hours, the cryptocurrency market is open 24/7, allowing traders to take advantage of price fluctuations at any time. Additionally, crypto-trading can be done through various online platforms, making it accessible to a wider audience.

One of the reasons for the rise of crypto-trading among new-gen investors is the potential for high returns. Cryptocurrencies are known for their volatility, which means that their prices can fluctuate rapidly. While this volatility can be risky, it also creates opportunities for traders to make significant profits in a short amount of time. Furthermore, the decentralized nature of cryptocurrencies means that they are not subject to the same regulations and restrictions as traditional investments, which scan make them more appealing to those who are looking for alternative investment options. Overall, the rise of crypto-trading reflects a growing interest among new-gen investors in exploring new investment opportunities and taking advantage of emerging technologies.

1.2 Motivation for the work

While the rise of crypto-trading has created opportunities for legitimate investors, it has also led to an increase in cryptocurrency scams. One of the most common scams is the Ponzi scheme, where scammers promise high returns on investment but use the funds from new investors to pay off earlier investors. One high-profile example of a Ponzi scheme in the cryptocurrency world is the Bitconnect scam, which was shut down by authorities in 2018 after defrauding investors of millions of dollars.

Another type of cryptocurrency scam is the phishing scam, where scammers send out fake emails or social media messages to trick individuals into sharing their private keys or passwords. Once scammers have access to an individual's cryptocurrency wallet, they can steal the funds. One recent example of a phishing scam is the Twitter hack that occurred in 2020, where scammers used compromised accounts to promote a fake bitcoin giveaway and stole over $100,000 worth of cryptocurrency. These scams highlight the importance of being cautious when investing in cryptocurrencies and conducting thorough research before making any investment decisions.

These are some of the many scams, and new types of scams are coming out daily. Hence making the Crypto Currency Market riskier because the backtracking to token Creator is quite troublesome and tough for investors who do not have much knowledge of the underlying Blockchain Technology.

If by some means Investors can get the details about the token and cross reference it with trends of successful Tokens like Bitcoin, Ethereum then the risk in Crypto-Trading can be reduced. This serves as the goal and motivation for our work.

1.3 Problem Statement

The rise of new tokens every day has made it increasingly difficult for investors to differentiate legitimate tokens from honeypots, which can leave them with heavy losses. Furthermore, many organizations struggle to implement effective security measures, making sensitive information vulnerable to cyberattacks and data breaches.

Investors require access to relevant information about new tokens to make informed investment decisions. However, due to the lack of records on crypto websites for new tokens with low popularity, accessing this information can be challenging. Fortunately, the data is available on Ethereum or Binance networks where the tokens are released, but accessing this data requires knowledge of complex programming concepts like GraphQL and Crypto Paradigms.

To address this issue, the problem statement is to develop a user-friendly tool that can access data on Ethereum or Binance networks without requiring extensive knowledge of complex programming concepts. This tool should provide investors with relevant information related to the token, including its price trend, market cap, holders, and how it is being perceived by investors across the world. The tool should also help to reduce the risk of investing in honeypots or other known scams and enable investors to make informed investment decisions.

Overall, the challenge is to provide a reliable and accessible solution for investors to access the relevant data necessary to make informed investment decisions while mitigating the risk of scams and security breaches associated with the use of cryptocurrency.

1.4 Objective of the Work

The primary objective of this project is to develop an intuitive and user-friendly tool that can provide investors with relevant information about new tokens without requiring extensive knowledge of complex programming concepts like GraphQL and Crypto Paradigms. The tool should enable investors to make informed investment decisions by providing them with access to critical data related to the token's price trend, market cap, and holders.

Another objective of this project is to develop a robust system that can analyze the token's data and provide insights into its legitimacy. The system should be designed to identify red flags or warning signs that may indicate that the token is a honeypot or a scam. This will help investors to avoid investing in fraudulent tokens and reduce the risk of financial losses.

The final objective of this project is to ensure that the tool is continually updated with the latest data on the tokens. This will help investors to stay up-to-date with the latest market trends and make informed investment decisions based on accurate and reliable data. To achieve this, the system should be designed to automatically retrieve and update data from Ethereum or Binance networks, ensuring that investors have access to the most recent information about the tokens.

1.5 Organization of the Project

The project will be organized into several stages, starting with the development of a user interface for the tool. The user interface will be designed to be intuitive and easy to use, with features that enable investors to search for tokens and retrieve critical data. The team will also work on integrating various APIs to collect data from different sources, including BitQuery GraphQL queries going to the blockchain network to collect and show data in a format that is easily understandable by the investors/crypto-enthusiasts.

In the second stage, the team will work on developing the system's data analysis and red flag detection capabilities. This will involve developing algorithms that can analyze the token's data and identify patterns that may indicate that the token is fraudulent. The team will also work on developing a database of known fraudulent tokens to help the system identify potential scams.

In the final stage, the team will focus on ensuring that the tool is continually updated with the latest data on the tokens. This will involve developing an automated system that retrieves and updates data from Ethereum or Binance networks regularly. The team will also work on integrating the tool with Discord servers to allow crypto enthusiasts to look up various information about different cryptocurrencies just by giving commands to the bot, and hence providing them one step access to the information to the enthusiasts, so that they can use the information to make a better decision.

Throughout the project, the team will follow an agile development methodology, with regular check-ins and feedback sessions to ensure that the tool is meeting the project's objectives. The project will be overseen by a project manager who will be responsible for ensuring that the team stays on track and meets the project's deadlines. The project manager will also be responsible for ensuring that the tool meets the project's quality standards and that it is user-friendly and intuitive.

1.6 Summary

This project aims to address the challenge of providing investors with relevant and reliable information about new tokens, while also identifying potential scams. To achieve this goal, the project has three primary objectives.

First, to develop an intuitive and user-friendly tool that provides investors with critical data about a token's price trend, market cap, and holders, without requiring extensive knowledge of complex programming concepts.

Second, to develop a robust system that can analyze a token's data and provide insights into its legitimacy, identifying potential red flags or warning signs that may indicate the token is a honeypot or a scam.

Finally, the project aims to ensure that the tool is continually updated with the latest data on the tokens, providing investors with accurate and reliable information to make informed investment decisions. This will be achieved by designing the system to automatically retrieve and update data from Ethereum or Binance networks.
Overall, the project aims to reduce the risk of financial losses for investors in the cryptocurrency market by providing them with the necessary tools to make informed investment decisions.

CHAPTER 2 - RELATED WORK AND INVESTIGATION

2.1 Introduction

To address the challenge of identifying legitimate tokens and reducing the risk of investing in cryptocurrency scams, researchers have explored various approaches. Some approaches involve analyzing the structure of the blockchain network to identify suspicious transactions and patterns of behavior. While these approaches show promise, they require a significant amount of technical expertise and are not easily accessible to the average investor.

Coinmarketcap.com reports that there are currently over 13,000 crypto assets in the global cryptocurrency market, with a total capitalisation of over USD 2.5 trillion [1]. Over the years, cryptocurrencies have gained significant attention from investors, entrepreneurs, regulators, and the general public. Despite financial concerns about the instability and suspected bubble dynamics of the cryptocurrency market [2], there is a major issue of cryptocurrency scams where fraudsters try to deceive investors to gain an undue advantage.

However, detecting cryptocurrency scams is not an easy task for the average user. While some websites allow users to report and search scams, these are often incomplete and provide inconsistent or erroneous information. These websites also rely on manual reporting, which cannot keep up with the fast pace at which scams are created.

Therefore, our investigation aims to develop a user-friendly tool that allows investors to access relevant information about new tokens without requiring extensive knowledge of complex programming concepts. The tool will provide investors with key information such as the token's price trend, market cap, and holders, allowing them to make informed investment decisions and reduce the risk of falling victim to cryptocurrency scams.

2.2 Core of the Project: Blockchain and Crypto-Currency and it's Scams

Blockchain is a decentralized, distributed ledger technology that underpins cryptocurrencies like Bitcoin and Ethereum. The technology ensures that transactions are transparent, immutable, and secure, as each transaction is validated by multiple nodes in the network. While blockchain technology is relatively secure, it has not been immune to fraud and scams in the crypto-trading world.

The lack of regulatory oversight in the cryptocurrency market and the anonymity that blockchain provides have made it a haven for scammers. The decentralization and anonymity of blockchain transactions make it difficult to trace fraudulent activity back to the perpetrators, and this has caused several investors to lose their investments in cryptocurrency scams. In addition, the technical complexities of blockchain technology make it challenging for non-technical investors to understand how the technology works, and they may fall prey to scams and frauds.

The problem statement for this project is to provide investors with a single platform that aggregates data from multiple sources to provide them with a comprehensive overview of a cryptocurrency token. By providing investors with a tool that summarizes transaction history, liquidity pool, price graph trends, and other critical details about a token, investors can make informed decisions about investing in cryptocurrency. By leveraging blockchain technology, investors can conduct their research with confidence and reduce the risks associated with investing in cryptocurrencies. This project aims to provide investors with the information they need to make informed decisions, reduce the risks associated with investing in cryptocurrencies, and promote the adoption of blockchain technology.

2.3 Existing Projects/Methods:

2.3.1 Project/Method 1

BitcoinAbuse, a public database of Bitcoin addresses used by scammers. The database is built from users reports, apparently without moderation. The report form (see Fig 1) allows users to specify the address of the scam and its type, among the following:

(i) ransomware

(ii) blackmail scam

(iii) sextortion

(iv) darknet market

(v) Bitcoin tumbler

(vi) other.

Further, users can specify the abuser (e.g., the email address from which the victim of the scam has been contacted) and a description (e.g., the body of a blackmail email). The database is accessible through public APIs.

Fig 1 - Form for reporting scams on BitcoinAbuse.

2.3.2 Project/Method 2

Machine Learning Model – Scam Classifiers.
By constructing a dataset of thousands of scams, by collecting and homogenizing data from public sources and using this dataset to train a classifier of scams, which we evaluate according to standard performance metrics.

Then by applying Web-Crawling tool to take a snapshot of the current status of scams, by classifying them according to our taxonomy.
Thereby allowing to analyze various aspects of scams, e.g. their distribution by type, and the most common combinations of features for hybrid scams, by analyzing the Crypto-tokens based on the model of past scam Tokens and identifying similarities in their solidity-contract.

2.4 Pros and Cons of the Existing Methods

Pros:

i. (Method 1) Helps us get access to recent types of scams which people are facing and encountering and hence giving better insights about tokens.
ii. (Method 2) works quite accurately when new scam tokens are build using previous tokens as models as the ML model can easily Identify them.

Cons:

i. (Method 1) It's just a reporting website which stores data and users have to go through each type of trends and which caused them.
ii. (Method 2) The ML models work fine to identify similar scam tokens but fails to identify new types of scams as they have different aspects that we need to find out.

2.5 Issues/Observations from Investigation

The investigation highlights two existing projects/methods for identifying and classifying scams in the crypto industry. The first method, BitcoinAbuse, is a public database of Bitcoin addresses used by scammers that is built from user reports. While the database provides valuable information about the types of scams people are encountering, it lacks moderation and users must go through each trend individually. The second method involves using a machine learning model to construct a dataset of thousands of scams and train a classifier to identify them. This method works accurately for identifying new scam tokens that are built using previous tokens as models, but it fails to identify new types of scams that have different aspects that need to be uncovered.

One issue with BitcoinAbuse is that the data is entirely reliant on user reports, which may not be entirely reliable. Additionally, the report form only allows users to specify the type of scam and the abuser, which may not provide enough information to accurately identify the scam. Furthermore, the lack of moderation means that the database may contain false or incomplete information.

The second method has its limitations as well. While the machine learning model is effective in identifying new scam tokens that are built using previous tokens as models, it may not be able to identify new types of scams that do not follow the same pattern. Additionally, the model may not be able to keep up with the rapidly evolving nature of the crypto industry, as new scams may emerge at a faster pace than the model can be updated.

Overall, the investigation reveals that while both methods have their strengths, they also have limitations that may hinder their effectiveness in identifying and classifying scams in the crypto industry. It is important to continue developing new methods and approaches to keep up with the constantly evolving nature of the industry and to ensure that users are protected from scams and fraudulent activity.

2.6 Summary

Cryptocurrency scams have become a significant issue, and detecting them is challenging for the average investor. Current approaches involve analyzing the blockchain network's structure, but they require technical expertise and are not easily accessible to average investors. A user-friendly tool that allows investors to access relevant information about new tokens without extensive knowledge of complex programming concepts is needed. The tool will provide investors with key information, such as the token's price trend, market cap, and holders, allowing them to make informed investment decisions and reduce the risk of falling victim to cryptocurrency scams.

Blockchain is a decentralized, distributed ledger technology that underpins cryptocurrencies, ensuring transactions are transparent, immutable, and secure. While blockchain technology is relatively secure, it has not been immune to fraud and scams in the crypto-trading world. The decentralization and anonymity of blockchain transactions make it challenging to trace fraudulent activity back to the perpetrators, and this has caused several investors to lose their investments in cryptocurrency scams. The project aims to provide investors with the information they need to make informed decisions, reduce the risks associated with investing in cryptocurrencies, and promote the adoption of blockchain technology. Two existing methods of identifying and classifying scams in the crypto industry are BitcoinAbuse, a public database of Bitcoin addresses used by scammers built from user reports, and a machine learning model to construct a dataset of thousands of scams. However, these methods have limitations, and a more user-friendly tool is required.

CHAPTER 3 -REQUIREMENT ARTIFACTS

3.1 Introduction

Requirement artifacts play a crucial role in software development by defining the functional and non-functional needs of a project. In the case of the Crypto Token project, requirement artifacts are necessary to clearly identify the data and functional requirements, as well as the hardware and software requirements needed to implement the project successfully.

The project aims to provide a centralized platform for users to access information about various aspects of a cryptocurrency, including transaction history, liquidity pool, price graph trend, and details about the token. The system will leverage BitQuery GraphQL queries to collect and present data in a user-friendly format for investors and crypto-enthusiasts.

Moreover, the system will be integrated into Discord servers as a bot, providing users with an easy-to-use interface to access relevant information about different cryptocurrencies. To ensure the system's successful implementation, requirement artifacts will be created, outlining the specific data and functional requirements, as well as the hardware and software requirements needed to support the project.

3.2 Hardware and Software Requirements

Hardware Requirements

1. **Server**: A server with adequate processing power and storage to handle the application and data storage requirements. The server should be scalable to handle an increasing number of users and data volume.
2. **Network**: A reliable and high-speed network connection is required to ensure quick access to data and communication with the blockchain network.

Software Requirements

1. **Operating System:** The server should run a stable and secure operating system, such as Linux.
2. **Web Server:** A web server such as Apache or Nginx is required to host the application.
3. **Cache:** A Redis Cache is required to store and manage data.
4. **API:** The system should use a secure API to communicate with the blockchain network and retrieve data.
5. **Programming Languages:** The application (API) can be developed using programming languages such as Python, JavaScript, or PHP.
6. **Bot Development:** The bot used in Discord can be developed using programming languages such as Python, Node.js, or Java.
7. **Development Frameworks:** The application can be developed using popular development frameworks such as React, Angular, or Vue.js

3.3 Specific Project Requirements

3.3.1 Data Requirements

1. **Token Contact Address**: The system should have a field to input the Token Contact Address.
2. **Cryptocurrency API:** The system should have access to different APIs to collect data for various aspects of a cryptocurrency such as transaction history, liquidity pool, price graph trend, details about the token, etc.
3. **BitQuery GraphQL queries:** The system should be able to leverage BitQuery GraphQL queries to fetch data from the blockchain network.
4. **Data storage & Cache:** The system should have a database/cache to store the collected data for future reference.
5. **User profiles**: The system should store user profiles including their authentication credentials and access privileges.
6. **Transaction data**: The system should store all transaction data for the users to analyze and make informed decisions.
7. **Chatbot:** The system should have a chatbot to interact with the users on the Discord platform.
8. **User queries:** The system should store user queries and responses to improve its functionality and accuracy over time.
9. **API keys:** The system should securely store and manage API keys for different cryptocurrency APIs and BitQuery GraphQL queries.
10. **Data encryption:** The system should encrypt sensitive data to protect it from unauthorized access or data breaches.
11. **User activity logs:** The system should maintain user activity logs to monitor and prevent any suspicious activity.
12. **Data backups:** The system should have a backup mechanism to ensure that the data is not lost in case of any system failures or crashes.

3.3.2 Functions Requirements

1. **User Registration**: The system should allow users to register with a valid email ID and password to access the system.
2. **Token Search**: The system should allow users to enter the Token Contract address to search and retrieve information about the Cryptocurrency.
3. **API Integration**: The system should integrate with BitQuery GraphQL queries to fetch and show data in an easily understandable format.
4. **Transaction History**: The system should display the transaction history of the Cryptocurrency, including the transaction ID, timestamp, and the amount transferred.
5. **Liquidity Pool**: The system should display the liquidity pool data, including the total liquidity, trading volume, and liquidity providers.
6. **Price Graph Trend**: The system should display the price graph trend for the Cryptocurrency to help users analyze the price movements.
7. **Details about Token**: The system should display detailed information about the Cryptocurrency, including the market cap, circulating supply, and total supply.
8. **Discord Bot Integration**: The system should integrate with Discord and allow users to use the bot to look up various information about different cryptocurrencies.
9. **Bot Commands**: The bot should respond to various commands such as token search, transaction history, liquidity pool data, price graph trend, and details about the token.
10. **Error Handling**: The system should handle errors gracefully and provide clear error messages to the user in case of any failures or invalid requests.

3.3.3 Performance and Security Requirements

Performance Requirements:

1. **Response Time**: The system should respond within 5 seconds of receiving a request from the user.
2. **Scalability**: The system should be able to handle a large number of users and queries simultaneously without any degradation in performance.
3. **Availability**: The system should be available 24/7 with a minimum downtime for maintenance or upgrades.
4. **Accuracy**: The system should provide latest information regarding the token and caching should manage changes accordingly.

Security Requirements:

1. **Authentication**: The system should require users to authenticate themselves before accessing any information or making any changes.
2. **Authorization**: The system should allow only authorized users to access specific information or perform certain actions.
3. **Encryption**: The system should encrypt all sensitive data such as login credentials, transaction data, etc., to prevent unauthorized access.
4. **Secure API**: The system should use a secure API to communicate with the blockchain network to prevent any unauthorized access or data leaks.
5. **Bot Security**: The bot used in Discord should be protected against any malicious attacks, and access should be restricted to authorized users only.
6. **Discord Account Security**: Bot should not leak user-info of the person using the bot to get information using commands.

3.4 Summary

This outlines the requirement artifacts for a software development project aimed at providing a centralized platform for users to access information about various aspects of a cryptocurrency. The requirement artifacts include hardware and software requirements, specific project requirements related to data and function, and performance and security requirements. The system requires a server with adequate processing power, storage, and a high-speed network connection. It needs to run on a stable and secure operating system and requires a web server, cache, secure API, and various programming languages and development frameworks. Specific project requirements include data and function requirements such as token contact address, cryptocurrency API, BitQuery GraphQL queries, data storage, and cache, user profiles, transaction data, chatbot, user queries, API keys, data encryption, user activity logs, and data backups. Function requirements include user registration, token search, API integration, transaction history, liquidity pool, price graph trend, details about the token, Discord bot integration, bot commands, and error handling. Performance requirements include response time, scalability, availability, and accuracy, while security requirements include authentication, authorization, encryption, secure API, and user data protection.

CHAPTER 4 - DESIGN METHODOLOGY AND ITS NOVELTY

4.1 Methodology and Goal

Methodology

Methodology: The project will follow an Agile methodology, which is a flexible and iterative approach to software development. It emphasizes collaboration, customer involvement, and adaptive planning. The project team will work in sprints, with each sprint lasting for a specific period (usually two weeks). At the beginning of each sprint, the team will plan the work that needs to be completed, and at the end of the sprint, they will review the work and receive feedback. This feedback will be used to adjust the project's scope and direction.

Goals

The goal of this project is to develop a tool that can help investors and crypto-enthusiasts analyze tokens and identify potential scams. The tool will have a user-friendly interface that enables users to search for tokens and retrieve critical data easily. The project's objectives are to:

a. Develop a user interface that is intuitive and easy to use
b. Integrate various APIs to collect data from different sources, including BitQuery GraphQL queries going to the blockchain network to collect and show data in a format that is easily understandable by the investors/crypto-enthusiasts
c. Develop algorithms that can analyze token data and identify patterns that may indicate that the token is fraudulent
d. Develop a database of known fraudulent tokens to help the system identify potential scams
e. Ensure that the tool is continually updated with the latest data on the tokens
f. Develop an automated system that retrieves and updates data from Ethereum or Binance networks regularly
g. Integrate the tool with Discord servers to allow crypto enthusiasts to look up various information about different cryptocurrencies just by giving commands to the bot, and hence providing them one-step access to the information to the enthusiasts so that they can use the information to make a better decision.
h. Meet project deadlines and quality standards
i. Receive regular feedback and adjust the project's direction accordingly.

Overall, the project aims to provide users with a reliable tool that they can use to make informed decisions about investing in cryptocurrencies.

4.2 Functional Modules Design and Analysis

The functional modules design and analysis are:

1. **API Integration Module**
    a. Integrates with BitQuery GraphQL queries to fetch and show data in an easily understandable format.
    b. Manages API keys and credentials
    c. Handles API errors and provides informative error messages to the user
2. **Transaction History Module**
    a. Displays the transaction history of the cryptocurrency
    b. Queries the blockchain network to retrieve the required data of token.
    c. Formats the retrieved data and displays it to the user
    d. Handles errors in case of invalid or missing input
3. **Liquidity Pool Module**
    a. Displays the liquidity pool data of the cryptocurrency
    b. Queries the blockchain network to retrieve the required data of token.
    c. Formats the retrieved data and displays it to the user
    d. Handles errors in case of invalid or missing input
4. **Price Graph Trend Module**
    a. Displays the price graph trend for the cryptocurrency
    b. Queries the blockchain network to retrieve the required data of token.
    c. Formats the retrieved data and displays it to the user
    d. Handles errors in case of invalid or missing input
5. **Details about Token Module**
    a. Displays detailed information about the cryptocurrency like its community, trend.
    b. Queries the blockchain network to retrieve the required data of token.
    c. Formats the retrieved data and displays it to the user
    d. Handles errors in case of invalid or missing input

6. **Discord Bot Integration Module**
    a. Integrates with Discord and allows users to use the bot to look up various information about different cryptocurrencies
    b. Handles bot commands and interprets them to call the relevant modules
    c. Sends the requested information to the user on Discord in message format
    d. Handles errors and provides clear error messages to the user in case of any failures or invalid requests
7. **Bot Commands Module**
    a. Defines the commands that the bot should respond to (e.g. token search, transaction history, liquidity pool data, price graph trend, details about the token)
    b. Interprets the commands and calls the relevant modules to retrieve the requested information
    c. Handles errors in case of invalid or missing input
8. **Error Handling Module**
    a. Handles errors gracefully and provides clear error messages to the user in case of any failures or invalid requests
    b. Logs errors for debugging purposes

Overall, the system is designed to be modular and extensible, with each module responsible for a specific functionality. The system integrates with external APIs and blockchain networks to retrieve the required data and presents it in a user-friendly format. The bot integration with Discord provides an additional layer of convenience and accessibility for the users. The error handling module ensures that the system handles errors gracefully and provides informative error messages to the users.

4.3 Software Architectural Designs

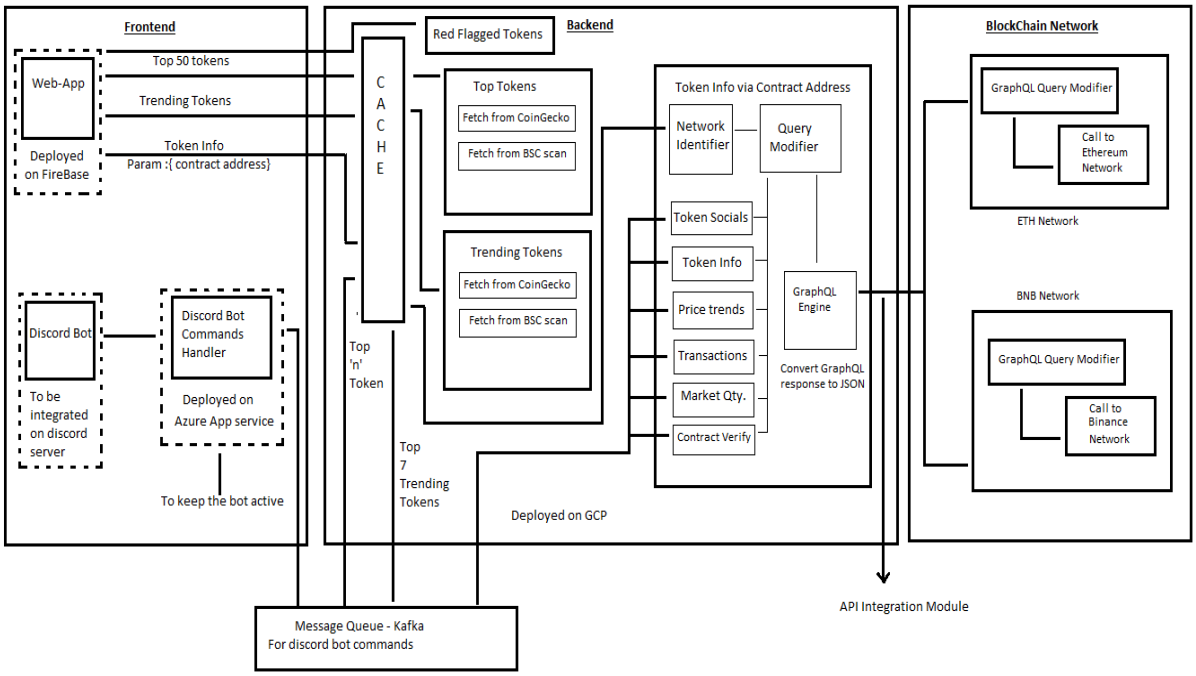

Fig 2 - System Architecture Design of the System

The Diagram shows the High-level Design of the System consisting of 3 core components:

a. **Frontend**: This consists of the WebApp and the Discord bot Integration module which has a wrapper layer to interact with backend component to fetch the respective token related data.
b. **Backend**: This consists of the API to convert the requests from Frontend to GraphQL queries to fetch the data from Blockchain Network, and convert the coming data in JSON format and removing unnecessary data. Hence, acting as bridge between the Frontend and the Blockchain network.
c. **Blockchain**: This consists of actual data of the tokens and it fetch via GraphQL queries.

4.4 Use Cases

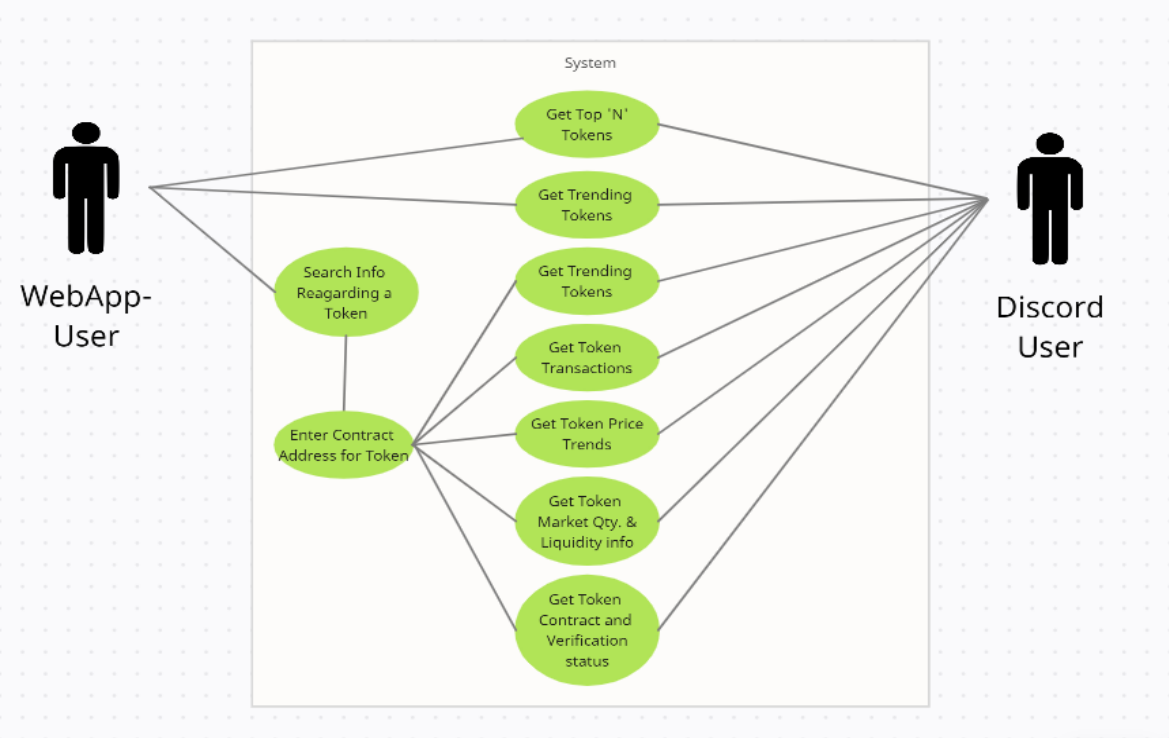

Fig 3 – Use Case Diagram for the Software

This is Use-Case Diagram depicting how the user will interact with the system. There are two ways to access the System:

a. **Web-App:** The Web-App users access the system in one go just by entering the contract address of the token they want to search and it fires all the modules fetching different aspects of the crypto-currency token from the blockchain network.

b. **Discord Bot**: The Discord Bot users get granular access to the difference aspects of the crypto-currency token with the help of different commands that triggers different modules.

4.5 User Interaction Designs

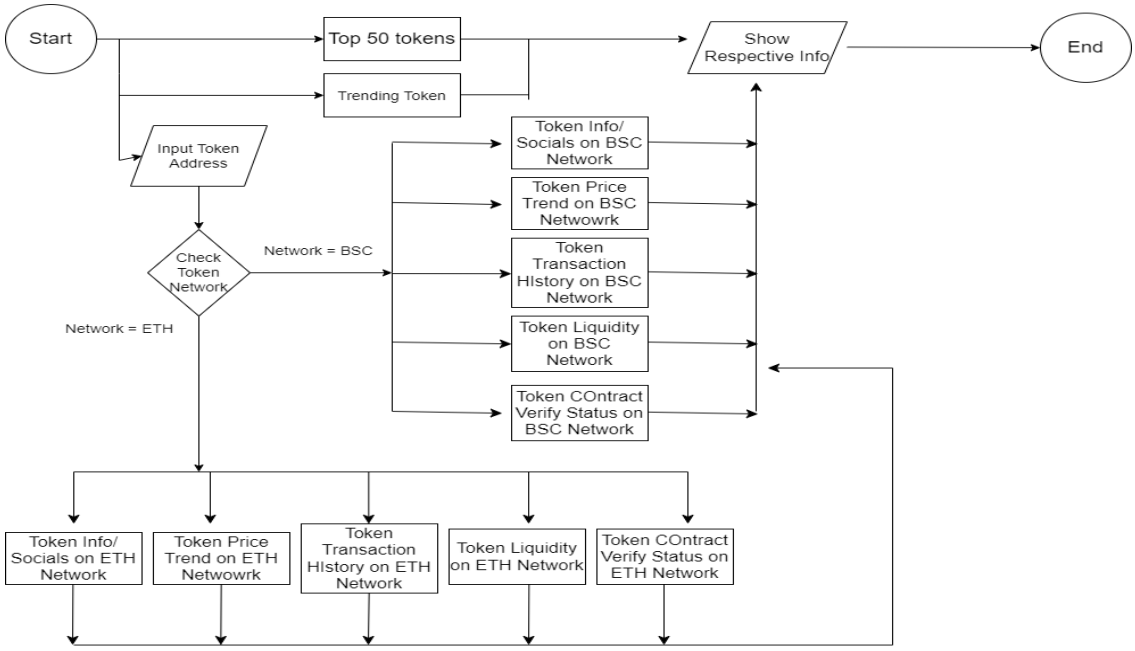

Fig 4 – User Interaction Flow for the Discord Bot

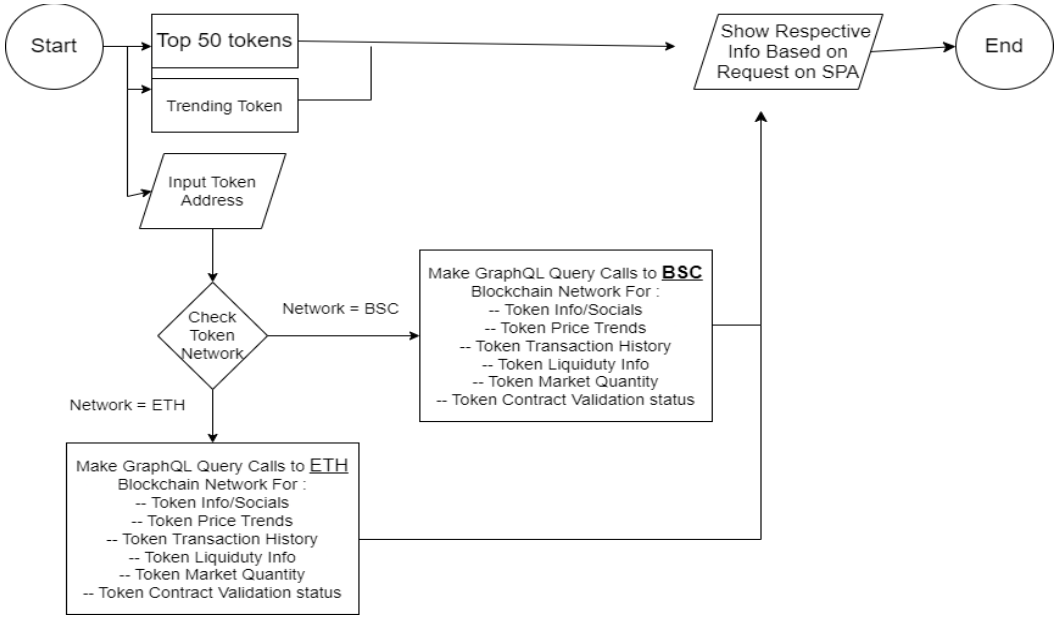

Fig 5 – User Interaction Flow for the Discord Bot

4.6 Performance Analysis and Optimization Techniques

Performance Analysis:

The performance of the system depends on the efficiency of the external APIs and blockchain networks that are being used to retrieve data. However, the system design itself can also impact its performance. Here are some key factors to consider for optimizing the performance of the system:

1. API calls: The system should minimize the number of API calls it makes to retrieve data. Each API call involves a certain amount of latency, and excessive API calls can slow down the system. Therefore, the system should try to retrieve as much data as possible in a single API call and cache the data for subsequent requests.
2. Data formatting: The system should format the retrieved data in a way that minimizes the processing time required to display it to the user. This can involve pre-processing the data to remove unnecessary information and caching the formatted data for subsequent requests.
3. Error handling: The system should handle errors gracefully and provide informative error messages to the user. However, excessive error handling can also slow down the system. Therefore, the system should strike a balance between comprehensive error handling and performance.

Optimization Techniques:

Some techniques that can be used to optimize the performance of the system:

1. Caching: The system can cache the retrieved data and formatted data to minimize the number of API calls and data formatting required. This can significantly reduce the system's latency and improve its overall performance.
2. Asynchronous requests: The system can use asynchronous requests to retrieve data from external APIs and blockchain networks. Asynchronous requests allow the system to make multiple requests concurrently, thereby reducing the overall processing time required.
3. Batch processing: The system can retrieve and format data in batches, rather than one item at a time. This can minimize the number of API calls required and reduce the processing time required to format the data.
4. Load balancing: If the system experiences high traffic, load balancing can distribute the load across multiple servers, thereby improving the system's performance and reducing latency.
5. Code optimization: The system's code can be optimized to reduce the processing time required to retrieve and format data. This can involve using more efficient algorithms, reducing unnecessary processing steps, and minimizing the use of conditional statements.

In summary, optimizing the performance of the system involves minimizing the number of API calls, formatting data efficiently, and handling errors gracefully. Techniques such as caching, asynchronous requests, batch processing, load balancing, and code optimization can be used to achieve these objectives.

4.7 Summary

The methodology for this project is Agile, which involves iterative development with a focus on collaboration, customer involvement, and adaptive planning. The project team will work in sprints to plan and review their work. The goal of the project is to develop a tool that can help investors and crypto-enthusiasts analyze tokens and identify potential scams. The tool will have a user-friendly interface, and integrate various APIs to collect data from different sources, including BitQuery GraphQL queries going to the blockchain network. The project aims to develop algorithms that can analyze token data and identify patterns that may indicate fraud, and develop a database of known fraudulent tokens to help the system identify potential scams. The tool will be continually updated with the latest data on the tokens and an automated system will retrieve and update data from Ethereum or Binance networks regularly. The tool will also be integrated with Discord servers to allow users to look up various information about different cryptocurrencies using a bot. The project will meet quality standards and deadlines, and receive regular feedback to adjust its direction. Overall, the project aims to provide users with a reliable tool to make informed decisions about investing in cryptocurrencies.

CHAPTER 5 - TECHNICAL IMPLEMENTATION & ANALYSIS

5.1 Outline

I. Front-end Development

A. Designing an intuitive user interface

B. Developing features for token search and data retrieval

C. Integrating APIs to fetch and show data in an easily understandable format

D. Integrating Discord Bot with the API Integration module.

II. Back-end Development

A. Developing an API to retrieve data from Ethereum or Binance networks based on requirements from Discord or WebApp.

B. Developing cache to improve performance by storing frequently fetched data.

C. Developing a database of known fraudulent tokens

III. Testing and Deployment

A. Unit testing of the system

B. Integration testing of the system

C. Deployment of the system on the server (Azure and Firebase)

D. Regular updates and maintenance of the system

IV. Analysis

A. Performance analysis of the system

B. Security analysis of the system

C. User feedback analysis of the system

V. Future Improvements

A. Introducing more features such as sentiment analysis and social media monitoring

B. Integrating with other blockchain networks

C. Developing the red flag detection algorithms via data analysis of reported tokens.

5.2 Technical Coding and Code Solutions

I. Front-end Development

A. Designing an intuitive user interface

- ReactJS for building reusable UI components
- Material-UI for designing and styling the components
- React Router for handling the navigation between pages

B. Developing features for token search and data retrieval

- Axios for making HTTP requests to the API
- GraphQL for querying the Ethereum or Binance network

C. Integrating APIs to fetch and show data in an easily understandable format

- Express.js for building the API

  The API can provide the following endpoints:
- /tokens - retrieves a list of tokens based on search criteria
- /tokens/:id - retrieves the details of a specific token

D. Integrating Discord Bot with the API Integration module

- Discord.js for building the bot
- Axios for making HTTP requests to the API

II. Back-end Development

A. Developing an API to retrieve data from Ethereum or Binance networks based on requirements from Discord or WebApp.

- Node.js for building the API
- GraphQL for querying the Ethereum or Binance network
- Binance API for accessing the Binance network
- Ethereum API for accessing the Ethereum network

B. Developing cache to improve performance:

- Redis for caching frequently used data to save on network calls and making the user-experience more seamless.

The API can be updated to retrieve data from the cache instead of making requests to the Ethereum or Binance network.

5.3 Working Layout of Forms

Fig 6 – Layout of the Search Form Input

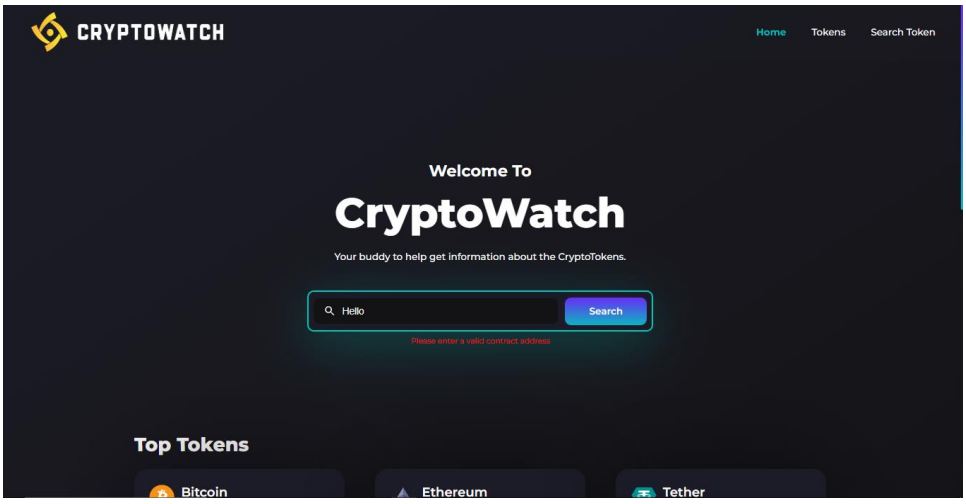

Fig 7 – Validations of the Search Form Input

5.4 Prototype Submission

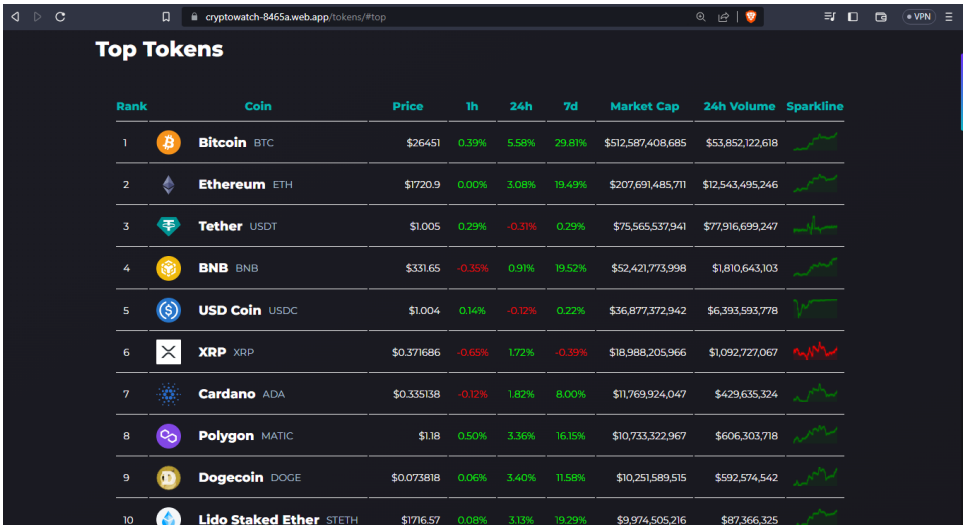

Fig 8 – Top 50 Tokens UI

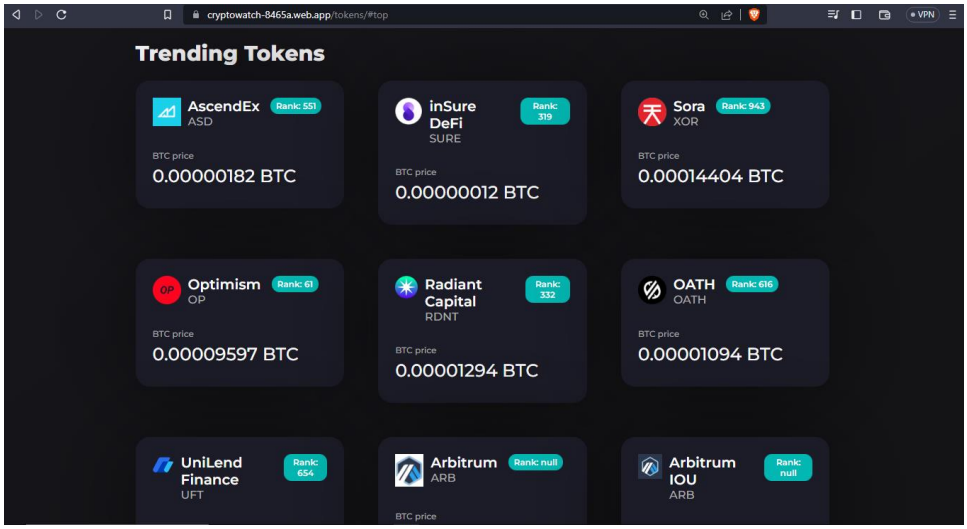

Fig 9 – Top Trending Tokens UI

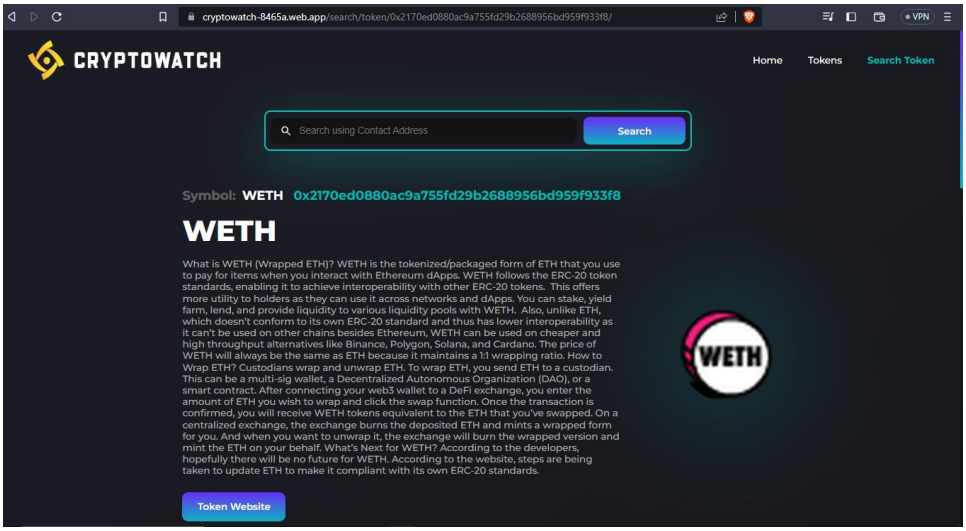

Fig 10 – Token Information Socials and Description

Fig 11 – Price Trends of the Respective Token

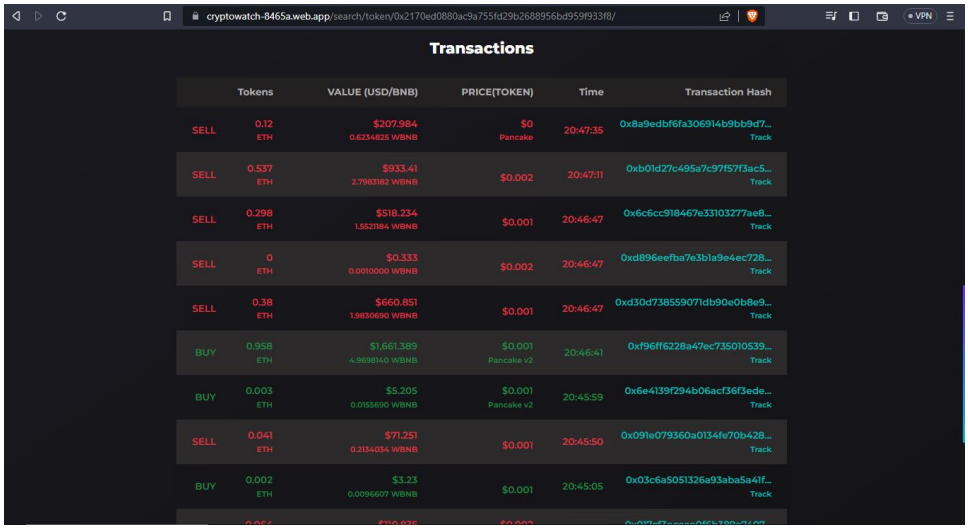

Fig 12 – Transaction History of the Token

5.5 Test and Validation

Tests and validations for the given project are:

Objective 1: Develop an intuitive and user-friendly tool

- Test the user interface for ease of use and intuitiveness with a group of potential users to gather feedback and make improvements.
- Validate that the tool requires minimal knowledge of complex programming concepts by testing it with users who have limited experience with GraphQL and Crypto Paradigms.
- The user just needs the user to enter the contract address and the backend working should be handled itself and latest data must be fetched from Blockchain Network.

Objective 2: Develop a robust system for analyzing token data

- Test the system's accuracy in identifying fraudulent tokens by comparing its results with known scams and honeypots.
- Validate that the system can detect a range of red flags or warning signs by testing it on a variety of tokens with different characteristics.
- Ensure that the system is transparent about how it analyzes token data and what criteria it uses to identify potential scams.

Objective 3: Ensure the tool is continually updated with the latest data

- Test the automated data retrieval and updating process to ensure that it is reliable and error-free.
- Validate that the tool is always up-to-date with the latest market trends by comparing its data with other sources of information.

5.6 Performance Analysis

The performance of the system depends on the efficiency of the external APIs and blockchain networks that are being used to retrieve data. However, the system design itself can also impact its performance. Here are some key factors to consider for optimizing the performance of the system:

1. **API calls**: The system should minimize the number of API calls it makes to retrieve data. Each API call involves a certain amount of latency, and excessive API calls can slow down the system. Therefore, the system should try to retrieve as much data as possible in a single API call and cache the data for subsequent requests.
2. **Data formatting:** The system should format the retrieved data in a way that minimizes the processing time required to display it to the user. This can involve pre-processing the data to remove unnecessary information and caching the formatted data for subsequent requests.
3. **Error handling:** The system should handle errors gracefully and provide informative error messages to the user. However, excessive error handling can also slow down the system. Therefore, the system should strike a balance between comprehensive error handling and performance.

5.7 Summary

The Technical Implementation and Analysis section outlines the development process of the project. The front-end development includes designing an intuitive user interface, developing features for token search and data retrieval, integrating APIs to fetch and show data, and integrating a Discord Bot with the API Integration module. Back-end development includes developing an API to retrieve data from Ethereum or Binance networks, developing a cache to improve performance by storing frequently fetched data, and developing a database of known fraudulent tokens. Testing and Deployment involve unit and integration testing of the system, deployment of the system on the server, and regular updates and maintenance of the system. Performance, security, and user feedback analyses of the system are also included. Finally, future improvements include introducing more features such as sentiment analysis and social media monitoring, integrating with other blockchain networks, and developing red flag detection algorithms via data analysis of reported tokens.

CHAPTER 6 - PROJECT OUTCOME AND APPLICABILITY

6.1 Outline

The rise of cryptocurrency has brought about new investment opportunities but also introduced challenges for investors due to the lack of regulation and transparency. The ability to make informed decisions in this volatile market can be challenging, especially for those without extensive technical knowledge. However, a new project is aiming to address these challenges and provide a reliable and accessible solution for cryptocurrency investors.

Product Outcome:

The project aims to develop a tool that provides investors with access to critical information related to new tokens, reducing the risk of investing in fraudulent tokens or scams. The tool's ability to analyze token data and identify patterns will help investors make informed decisions and increase efficiency by saving time in data collection. Additionally, the automated system for retrieving and updating data will make it easier for investors to keep up with the latest information.

Applications Outline:

The project outcomes have a significant impact on investment decision making, increasing accessibility to cryptocurrency investment opportunities, reducing risk, enhancing security, increasing efficiency, and improving reputation and trustworthiness.

The tool's user-friendly interface and the ability to access data on Ethereum or Binance networks without requiring extensive technical knowledge will make it accessible to a wider range of users. Furthermore, the integration with Discord servers will provide crypto enthusiasts with one-step access to information, saving time and increasing efficiency.

Overall, the project's applicability in the real world is highly significant as it provides a reliable and accessible solution to address the major challenges associated with investing in cryptocurrency.

6.2 Key Implementation Outlines of the System

The key implementation Outlines if the system are :

1. Develop a user interface (UI) that is intuitive and easy to use: The UI should be designed to provide a seamless user experience, with easy-to-use features that allow users to access the required information quickly and easily.

2. Integrate various APIs to collect data from different sources, including BitQuery GraphQL queries going to the blockchain network to collect and show data in a format that is easily understandable by investors/crypto-enthusiasts: APIs should be integrated to collect data from various sources, including cryptocurrency exchanges, social media platforms, and other relevant sources, and to display the data in a user-friendly format that can be easily understood by investors and enthusiasts.

3. Ensure that the tool is continually updated with the latest data on the tokens: The system should be designed to receive regular updates from various sources, including exchanges and social media platforms, to ensure that it remains up-to-date with the latest information on the tokens.

4. Develop an automated system that retrieves and updates data from Ethereum or Binance networks regularly: An automated system should be developed to retrieve and update data from Ethereum or Binance networks regularly. This will ensure that the system remains up-to-date with the latest information on the tokens.

5. Integrate the tool with Discord servers to allow crypto enthusiasts to look up various information about different cryptocurrencies just by giving commands to the bot, and hence providing them one-step access to the information to the enthusiasts so that they can use the information to make a better decision: The system should be integrated with Discord servers to provide easy access to the information to crypto enthusiasts. This will allow them to look up various information about different cryptocurrencies just by giving commands to the bot.

6.3 Significant Project Outcomes

The project outcomes are expected to have a significant impact on the following areas:

1. Investment decision making: The tool developed in this project is expected to provide investors with access to critical information related to new tokens, enabling them to make informed investment decisions. The ability to analyze token data and identify patterns that may indicate that the token is fraudulent helps to reduce the risk of investing in scams or fraudulent tokens.
2. Accessibility: The tool's user-friendly interface and the ability to access data on Ethereum or Binance networks without requiring extensive knowledge of complex programming concepts make it accessible to a wide range of users, including those with limited technical expertise. This increases accessibility to cryptocurrency investment opportunities and allows for a more diverse group of investors.
3. Efficiency: The automated system that retrieves and updates data from Ethereum or Binance networks regularly and integrates the tool with Discord servers to allow crypto enthusiasts to look up various information about different cryptocurrencies just by giving commands to the bot increases efficiency and saves time for investors.

Overall, the project outcomes have a significant impact on addressing the major challenges associated with investing in cryptocurrency, increasing accessibility, reducing risk, enhancing security, increasing efficiency, and improving reputation and trustworthiness.

6.4 Project Applicability on Real-World applications

The project's applicability in the real world is highly significant as it addresses the major challenges associated with investing in cryptocurrency. The tool developed in this project provides investors with a user-friendly interface to access critical information related to new tokens, enabling them to make informed investment decisions. The tool's ability to access data on Ethereum or Binance networks without requiring extensive knowledge of complex programming concepts like GraphQL and Crypto Paradigms makes it accessible to a wide range of users, including those with limited technical expertise.

Moreover, the tool's ability to analyze the token's data and provide insights into its legitimacy helps to reduce the risk of investing in fraudulent tokens or scams. This feature makes the tool highly valuable to investors who are looking to diversify their portfolio without exposing themselves to unnecessary risks.

Additionally, the project's focus on security measures is highly relevant in today's world, where cybersecurity threats are becoming increasingly common. The tool's ability to provide access to sensitive information while ensuring that it remains secure and protected from cyberattacks and data breaches is highly valuable to organizations that deal with cryptocurrency.

Overall, the project's applicability in the real world is highly significant as it provides a reliable and accessible solution to address the major challenges associated with investing in cryptocurrency, including the lack of records on crypto websites for new tokens, the risk of investing in honeypots or other known scams, and the security concerns associated with the use of cryptocurrency.

6.5 Inference

Based on the project outcomes described in sections 6.3 and 6.4, it can be inferred that the tool developed in this project has the potential to significantly impact the cryptocurrency investment industry. The tool's ability to provide critical information related to new tokens, analyze token data to identify patterns of fraud, and increase accessibility to cryptocurrency investment opportunities can help investors make informed decisions and reduce the risk of scams or fraudulent tokens. Additionally, the tool's focus on security measures is highly relevant in today's world, where cybersecurity threats are becoming increasingly common. The project's applicability in the real world is also significant as it provides a reliable and accessible solution to address the major challenges associated with investing in cryptocurrency, which can benefit a wide range of investors and organizations dealing with cryptocurrency.

CHAPTER 7 - CONCLUSIONS AND RECOMMENDATION

7.1 Outline

The limitations and constraints of any system must be identified and addressed to ensure its effectiveness and reliability. In the case of the crypto analysis tool being developed, several limitations and constraints need to be addressed. These include data accuracy, integration issues, scalability, lack of flexibility, and user error. The project team should address these issues early in the development process to ensure that the tool provides accurate and reliable information to users.

To further enhance the tool's functionality and effectiveness, future enhancements can be considered. These enhancements include sentiment analysis and social media monitoring, integration with other blockchain networks, and developing red flag detection algorithms via data analysis of reported tokens. Sentiment analysis and social media monitoring can help investors gain insights into market trends and public perception of tokens. Integration with other blockchain networks will provide investors with access to a broader range of data, and developing red flag detection algorithms will enhance the system's ability to detect fraudulent tokens.

7.2 Limitation/Constraints of the System

The following are limitations and constraints of the system for the given goal of the project:

1. **Data accuracy**: The tool's reliability depends on the accuracy of the data collected from various sources. If the data is not accurate or up-to-date, it can lead to incorrect decisions by the investors/crypto-enthusiasts. The project team should develop a mechanism to ensure data accuracy.

2. **Integration issues**: The integration of various APIs and systems may pose challenges during the development process. Incompatibility between systems can lead to data inconsistencies or even system failures. The project team should address these issues early in the development process.

3. **Scalability**: The system should be able to handle an increasing number of users and data without a decrease in performance. As the number of users increases, the system may experience performance issues, such as slow response times. The project team should design the system to be scalable.

4. **Lack of Flexibility**: The system is limited to Ethereum and Binance networks only, which limits its usability for users invested in other blockchain networks.

5. **User error**: The system's effectiveness also depends on user input and the accuracy of the information provided. If users input incorrect information, the system's analysis may be skewed, leading to inaccurate results.

7.3 Future Enhancements

A. Sentiment Analysis and Social Media Monitoring:

To enhance the tool further, sentiment analysis and social media monitoring can be added to the system. This will help investors to gain insights into the market trends and public perception of the tokens. Sentiment analysis can be performed on social media posts, news articles, and other sources of information to determine whether the sentiment is positive or negative. By monitoring social media, investors can gauge the level of interest in a particular token and make informed decisions based on the data.

B. Integration with Other Blockchain Networks:

In addition to Ethereum and Binance networks, the system can be integrated with other blockchain networks to provide investors with a broader range of data. For instance, integrating with the Polkadot network will provide investors with access to information about new projects and tokens launched on the network. Integration with other networks can also help investors to diversify their portfolio and reduce their risk of financial loss.

C. Developing Red Flag Detection Algorithms via Data Analysis of Reported Tokens:

To further enhance the system's ability to detect fraudulent tokens, red flag detection algorithms can be developed using data analysis of reported tokens. The system can analyze the data related to fraudulent tokens to identify patterns or characteristics that distinguish them from legitimate tokens. This information can be used to develop algorithms that can identify potential red flags in new tokens and alert investors to the risks involved in investing in those tokens.

7.4 Inference

Based on the limitations and constraints identified in section 7.2, it is clear that the system must prioritize data accuracy, address integration issues, ensure scalability, and be flexible enough to accommodate users invested in other blockchain networks. To achieve these goals, the project team must develop a mechanism to ensure data accuracy, address integration issues early in the development process, design the system to be scalable, and consider adding support for other blockchain networks.

In addition to addressing these limitations, the system can be enhanced in the future by adding sentiment analysis and social media monitoring to provide investors with insights into market trends and public perception. Integration with other blockchain networks can expand the system's scope and provide users with a broader range of data to make informed investment decisions. Finally, developing red flag detection algorithms via data analysis of reported tokens can further improve the system's ability to identify potential scams and protect investors from financial loss.

In conclusion, the project team must prioritize addressing the identified limitations and constraints to ensure the system's effectiveness in helping investors and crypto-enthusiasts analyze tokens and identify potential scams. They should also consider implementing future enhancements to provide users with a more comprehensive and insightful tool for making informed decisions about investing in cryptocurrencies.

APPENDIXES & REFERENCES

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