



CRYPTOCURRENCY TRACKER USING REAL-TIME API

¹Rishi Raj Ganguly, Manshi Rani, Akanksha Singh, ²Arpita Santra,

¹Student of ECE department of Narula Institute of Technology, ²Professor of ECE department of Narula Institute of Technology,

¹Electronics and Communication Engineering,

¹Narula Institute of Technology, Kolkata, India

Abstract: The **Cryptocurrency Tracker – Real-Time Insights for the Modern Investor** is a dynamic web application designed to meet the growing need for instantaneous access to cryptocurrency market data in an ever-evolving digital financial landscape. Over the past decade, cryptocurrencies like Bitcoin, Ethereum, Binance Coin, and Solana have revolutionized finance, gained immense popularity and created new avenues in technology, decentralized systems, and investment. As the market operates continuously and remains highly volatile, having real-time tools is essential for making timely and informed decisions. This tracker, built using the powerful ReactJS framework, delivers a responsive, fast, and user-friendly experience. It leverages reliable APIs such as Coin Gecko to fetch up-to-date information on thousands of cryptocurrencies. Users can view live prices, analyze market capitalizations, trading volumes, and 24-hour price changes, and access data-driven insights with ease. Features like advanced search, filtering, and interactive price charts further enhance usability, enabling users to explore historical trends, track volatility, and identify market opportunities. The application's clean, modern UI ensures seamless access across all devices. Beyond serving investors, the tracker is a valuable educational tool for students and educators, a resource for researchers analyzing digital asset trends, and an aid to public awareness amid growing crypto adoption. Looking ahead, the application offers immense potential for expansion through features like user accounts, portfolio tracking, customizable watchlists, crypto news integration, alert systems, multi-language support, and a dark mode interface. Altogether, it stands as a versatile platform bridging the gap between data accessibility and real-time decision-making in the crypto space.

I. INTRODUCTION

In recent years, the financial world has undergone a significant transformation, largely driven by the emergence and rapid adoption of cryptocurrencies. What began as an experimental concept with the launch of Bitcoin in 2009 has now evolved into a vast and complex ecosystem consisting of thousands of digital currencies, including well-known names such as Ethereum, Binance Coin, Solana, and countless others. These digital assets have captured the attention of investors, technologists, institutions, and governments alike due to their potential to disrupt traditional financial systems and introduce decentralized, transparent, and efficient alternatives. However, this fast-paced and highly volatile market—operating 24/7 without interruption—demands real-time tools that enable users to stay updated with the latest market conditions and make informed decisions instantly. In response to this need, our project, **The Cryptocurrency Tracker – Real-Time Insights for the Modern Investor**, was developed as a

robust and intuitive web application that provides seamless access to live cryptocurrency data. The tracker is built using **ReactJS**, a leading frontend framework known for its speed, flexibility, and component-based architecture, which allows for the creation of scalable and high-performance user interfaces. To ensure the accuracy and relevance of the data presented, the application integrates with **CoinGecko's API**, a trusted source for comprehensive cryptocurrency information. This combination empowers users to monitor real-time prices, track market capitalization, analyze 24-hour price changes, and explore trading volumes across a vast range of digital assets. Designed with user experience in mind, the tracker features a modern and responsive interface compatible across desktops, tablets, and mobile devices. Users can easily search and filter cryptocurrencies by name or market rank, visualize price movements through interactive charts, and gain a deeper understanding of market trends. Beyond serving as a tool for investors and traders, the application also holds educational and research value, helping students, educators, and analysts engage with cryptocurrency data in a hands-on, insightful manner. Moreover, the project lays the groundwork for future enhancements, such as portfolio tracking, personalized watchlists, multilingual support, news integration, and dark mode options—making it not only a functional solution for today's users but also a scalable platform prepared for future growth in the digital finance space.

II. DEFINITION

A **Cryptocurrency Tracker** is a specialized software tool or application designed to monitor and display real-time data related to the performance of various digital currencies. These currencies include well-known names such as Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), and many others. As the cryptocurrency landscape continues to grow and evolve, it has become increasingly essential for investors and traders to stay updated with the latest market developments. Given that cryptocurrency markets operate around the clock, prices and other key metrics can fluctuate dramatically even within seconds. This constant activity makes real-time monitoring tools like cryptocurrency trackers highly valuable. These trackers typically utilize public APIs (Application Programming Interfaces) to fetch live data from major crypto exchanges such as Binance, Coinbase, and Kraken. Once collected, this data is presented in a clear and user-friendly interface, often via websites or mobile applications, allowing users to quickly assess market trends and make informed decisions. The primary data displayed by these trackers includes the current price of cryptocurrencies in USD or other global currencies, 24-hour high and low prices to indicate short-term volatility, overall market capitalization (which is calculated by multiplying the current price by the total circulating supply), and trading volume over a 24-hour

period to gauge market activity. Additionally, users can view percentage changes over various time frames such as one hour, 24 hours, or seven days, helping them track momentum and price direction. The ultimate purpose of a cryptocurrency tracker is to empower users with accurate, real-time information, enabling them to respond swiftly and strategically to changes in the dynamic world of digital assets.

III. COMPONENTS NEEDED

1. Frontend Framework

- ReactJS – For building dynamic, component-based single-page applications.

2. API Services

- CoinGecko/CoinMarketCap API: For fetching live market data.

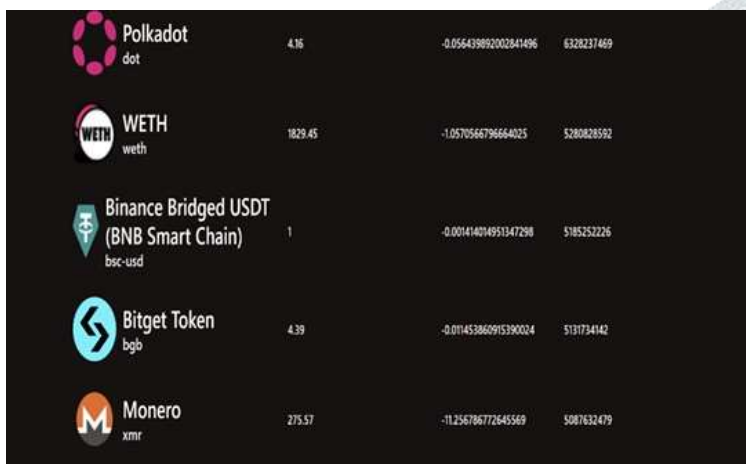
3. Libraries Used

- **Axios** – For making HTTP requests.
- **React Router DOM** – For client-side routing and navigation.
- **React Query** – For efficient data fetching, caching, and UI syncing.
- **TailwindCSS** – For utility-first and responsive UI design.

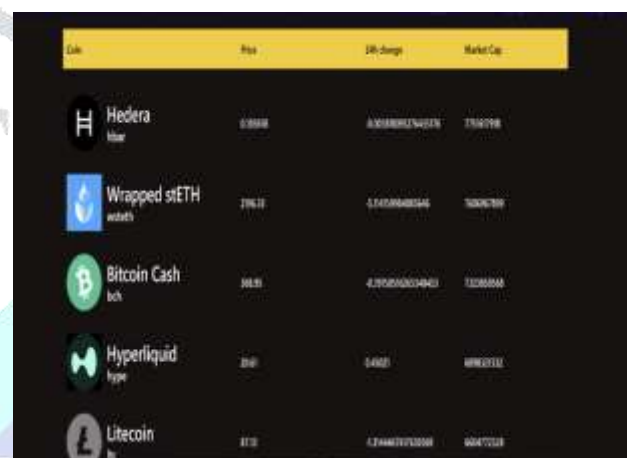
3. Hosting Platform

- **Vercel**
- **Netlify**

IV. WORKING



	Polkadot dot	4.16	-0.056439892002841496	6328237469
	WETH weth	1829.45	-1.0570566796644025	528828592
	Binance Bridged USDT (BNB Smart Chain) bsc-usd	1	-0.0014140748951347298	5185252226
	Bitget Token bgb	4.39	-0.011453866915390024	5131734142
	Monero xmr	275.57	-11.256786772645569	5087632479



Logo	Name	Price	24h change	Market Cap
	Hedera hbar	0.0048	-0.000000000000000000	27167918
	Wrapped stETH wsteth	2196.12	-0.000000000000000000	200000000
	Bitcoin Cash bch	348.91	-0.000000000000000000	222000000
	Hyperliquid hype	20.61	-0.000000000000000000	100000000
	Litecoin ltc	81.03	-0.000000000000000000	100000000

1. Frontend Setup

- Initialize a React application using Create React App (CRA).
- Set up routing and install necessary dependencies.

2. API Integration

- Fetch real-time cryptocurrency data using Axios from public APIs like CoinGecko.
- Update the UI dynamically using React Query to handle loading states, errors, and refetch intervals.

3. Data Handling & Display

- Render live price charts using libraries like React ChartJS.
- Display searchable tables with details like coin name, symbol, price, 24h change, and market cap.
- Implement filters and sorting mechanisms.

4. Deployment

- Deploy the app on platforms like Vercel for live access.

V. Application

1. Investor Support and Decision-Making Tool

The app plays a vital role in helping cryptocurrency investors monitor market trends in real time. It provides accurate, continuously updated information such as live prices, percentage changes, market capitalization, and volume statistics. These features assist users in tracking specific coins, comparing market performances, and making informed trading decisions. Investors can track short-term fluctuations or long-term performance directly through an easy-to-use dashboard. The app reduces the need for external tools by centralizing essential data in one place. Users can filter cryptocurrencies based on price, name, or change in value to help with quicker analysis.

2. Academic Research and Market Analytics This platform can be utilized by students, professors, and researchers involved in cryptocurrency-related studies. It enables the collection of real-time and historical data for research on market trends, volatility, investor behavior, and trading volume. With its ability to integrate charting tools and price indicators, the app allows researchers to conduct technical and fundamental analysis. It supports academic case studies, market simulations, and thesis projects focused on blockchain technology, digital currencies, or financial technology innovations.

3. Educational Tool for Students and Beginners This application serves as a great learning tool for those new to cryptocurrency and financial markets. Educational institutions or instructors can use the app to explain concepts such as market cap, price movement, supply and demand, and crypto volatility. It helps learners understand real-time data and how various market factors influence cryptocurrency prices. Students can gain hands-on experience with live markets and test their understanding by analyzing real-world examples. The app's simple layout makes it especially friendly for beginners who may be unfamiliar with complex financial platforms.

4. Portfolio Monitoring and Management Users can monitor specific coins by creating a personal watchlist or dashboard. Although the current version focuses on live data and visualization, the application can support features

COMMUNICATION ENGINEERING like portfolio tracking where users input purchase prices and quantities to calculate profit or loss. Such functionality makes it easier for individuals to monitor investments without needing spreadsheets or third-party tools. It offers centralized access to relevant data, reducing the manual effort involved in tracking and updating market positions. 5. Trading Alerts and Notifications (Planned Feature) The application may later include the ability for users to set price alerts for various cryptocurrencies. When a coin crosses a specified threshold, the user would receive a notification via email, SMS, or in-app alert. This feature is useful for those who do not want to constantly monitor prices but still need timely updates to take action. Price alerts allow users to respond to market conditions automatically and efficiently. 6. Integration with Fintech Applications The application's modular architecture and API-ready backend allow for future integration into other fintech ecosystems. This could include features like connecting with personal finance apps, digital wallets, trading apps, or cryptocurrency exchanges. Developers and fintech companies can integrate the real-time price feed and analytics into their systems to enhance their services. This opens up collaboration opportunities with businesses that require reliable and up-to-date crypto market data.

VI. MODELLING AND ANALYSIS

1. Artificial Intelligence Integration

AI will enhance crypto tracking with predictive analytics, identifying trends and future price movements. Smart alerts will recommend buy/sell actions based on indicators and unusual activities. Sentiment analysis will assess market emotions using news and social media data.

2. Blockchain Integration

Trackers will connect directly with blockchain explorers to display real-time, verified transaction data. Users will see activities like minting, burning, and staking. This ensures data authenticity and reduces misinformation.

3. Big Data and Machine Learning

Massive datasets will enable analysis of long-term market trends. Machine learning will detect early crash signals from trading patterns. Platforms will also use user behavior to personalize dashboards and recommendations.

4. Advanced Security Measures

User data will be protected through end-to-end encryption. Biometric logins such as fingerprint and face recognition will improve security. Secure token storage methods will prevent unauthorized access.

5. Multilingual and Global Expansion

Future apps will support multiple languages and show crypto prices in various currencies like INR, EUR, and JPY. Time zones and formats will adjust to the user's region for better usability.

6. Extended Features and Personalization

Users will track portfolio performance including gains, losses, and average cost. Predictive charts will help visualize future price zones. Dashboards will be fully customizable and include integrated news and social media updates.

VII. Conclusion

The **Cryptocurrency Tracker Using Real-Time API** project showcases how modern web technologies like React, Axios, React Query, and CoinGecko API can be used to build a responsive, real-time financial application. It offers live data on cryptocurrency prices, market caps, and trends through a clean interface with search, filter, and chart visualization features. React Query ensures smooth data handling, while ChartJS presents complex data in an easy-to-understand format. JWT-based authentication provides secure user login and profile management, setting the groundwork for personalized features like watchlists and portfolios. The app uses TailwindCSS for responsive design and Cloudinary for efficient image hosting. Future improvements may include portfolio tracking, AI-driven predictions, blockchain integration, and sentiment analysis. Strong security measures like encryption and token protection ensure trust and scalability. Overall, the project delivers a solid, scalable foundation for advanced crypto tracking and smart investment support.

VIII. REFERENCES

1. Hofman, A, The Dawn of the National Currency – An Exploration of CountryBased Cryptocurrencies. Retrieved from Bitcoin Magazine, March 2014.
2. Modgil, S, Indian Government Mulling Legalising Bitcoin Cryptocurrency In India. Retrieved from Inc42:<https://inc42.com/buzz/bitcoin-cryptocurrency-india-government/>, June 2017.
3. Retrieved from Research Gate: www.researchgate.net/publication/321780780_Scope_for_Bitcoins_in_India.
4. Christian Beer, B. W., Bitcoin – The Promise and Limits of Private Innovation in Monetary and Payment Systems. Retrieved from Research Gate, January 2015 <https://www.researchgate.net/publication/271473884>
5. Luther, W. (2016). Bitcoin and the Future of Digital Payments. The Independent Review, 20(3), 397- 404.