Crypto Tracker Using Mern Stack

Rahul Sahu*1, Sachin Yadav*2, Akash Singh*3, Abhishek Pandey*4, Asso. Prof. Umesh Dwivedi*5
*1,2,3,4,5 *Department Of Computer Science and Engineering, Babu Banarasi Das Northern India Institute of Technology, Lucknow, Utter Pradesh, India.*

***Abstract*—The rapid growth of the cryptocurrency market has created a strong demand for real-time data tracking tools that offer clear insights into market trends, price fluctuations, and asset management. This research introduces a modern, full-stack cryptocurrency tracking application developed using the MERN stack (MongoDB, Express.js, React.js, and Node.js). The platform aggregates and visualizes live market data retrieved from public cryptocurrency APIs, enabling users to monitor key metrics such as price changes over 24-hour and 7-day periods, market capitalization, and portfolio performance.**

Beyond technical implementation, the paper examines core challenges including API reliability, data consistency, and user interface responsiveness. The application emphasizes user accessibility through a dynamic and intuitive UI, allowing seamless navigation across features without compromising performance. Additionally, it highlights the significance of decentralized digital assets, which operate independently of traditional financial systems using block chain technology as a secure, distributed ledger.

In response to the growing public interest and regulatory attention surrounding digital currencies, this project aims to bridge the gap between complex block chain data and user-friendly insights. It provides a foundational tool not only for retail investors but also for researchers and analysts seeking real-time visibility into cryptocurrency markets.

I. INTRODUCTION

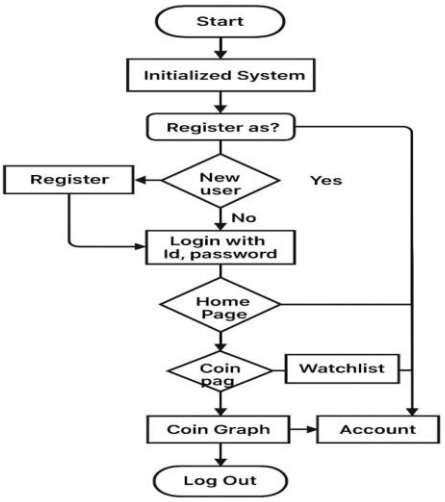
Cryptocurrency gains popularity because it becomes more accessible (easy to understand and user friendly), motivates individuals to look for better methods to monitor and maintain their digital assets. Even if you are an investor, a financial professional, or just enthusiastic about the crypto field, access to real -time information is necessary. Cryptocurrency markets can shift faster, and can stop users informed in making intelligent options, trending trends and managing their portfolio effectively. To develop these specifications to make equipment; Contemporary web technologies provide a solid foundation. They enable developers to manufacture efficient, accurate, reliable and user -friendly applications in various devices. One of the optimal technology stack for this purpose is Mernodb - a database - for a flexible and scalable method to represent cryptocurrency data. The platform enables users to attach users to attach real -time charts, data visualization and their individual cryptocurrency portfolio. For this project, we used Mern Stack to develop an application to track cryptocurrency. This application links to real -time cryptocurrency data sources, analyzes information, and presents it through a smooth and attractive interface. Users can easily observe ups and downs in price, track market trends, and oversee their investment at one place. The purpose of this tracker is to simplify complex data, allowing users to be informed and get better options in the rapidly changing crypto market. Whether you are reviewing daily rates or examining long -term patterns, the objective acts as a valuable, reliable resource in today's digital finance scenario.

II. METHODOLOGY

Project Overview Cryptocurrency has become a global phenomenon, which attracts wide attention due to their decentralized nature and ability to high returns. The beginning, began as a niche investment, has now developed in a mainstream financial option, not only to invest in digital assets with people, but also to start using daily transactions, online purchases and even border payments. Given the rapid growth and instability of the Crypto market, it has become necessary for devices that help users to perform real-time performance, price fluctuations and downs, and track various cryptocurrency trends. The project aims to create a web-based cryptocurrency tracking platform that provides clear, update and spontaneous view to users. The research component of the project is based on the secondary data collected from various reliable sources, including scholars' magazines, financial news sites and white-

collar and technical blogs. This data helped us gain market trends, user needs and deep understanding of technology scenario, which informed our design decisions and development approaches. The project is structured in several major stages: plan, design, implementation and testing. Each section of the application was developed with a clear purpose and is originally integrated with the rest of the system. The goal was to create a smooth and responsible experience for users, allowing them to track many cryptocurrency, view historical trends, and manage a virtual portfolio.

III. MODELING AND ANALYSIS



IV. RESULTS AND DISCUSSION

As for the development of the Crypto Tracker application, it self-evidently demonstrates that the MERN stack is applicable in tracking cryptocurrency in real time, Some overarching achievements are: APIs: Meta and trends of cryptocurrencies are taken from the gecko CoinAPIs. JWT Confirmation: Logins and registrations are authenticated and kept safely through JWT. Interactive Dashboards: Portfolios of the users are intricate and enable users to view interactive histories of charts that are trackable. It is mobile compatible which means it is responsive, hence the application loads at optimal speed. Data from the API loads quickly and the application is rendered accurately. There was graphic design done on the interface of the application and from the feedback gotten after testing, it exceeds their expectations in terms of speed, ease of use, and design aesthetics. The application does not have offline functionality while incorporating multiple external APIs and restricting the user to only open access.

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V. CONCLUSION

Being able to design everything from the ground up taught me a lot and is allowed me to have a little fun in building the Crypto Tracker. It was an opportunity to bring together a lot of new technology stacks to think about the challenge of how to provide a solution that allows users to track their cryptocurrency holdings in real-time. The application allows the user to track crypto prices, manage portfolios, and provide market insights. The combination of MongoDB, Express.js, React.js, and Node.js is all worked together to create a very user-friendly, responsive, and scalable space.

We encountered challenges along the way with real-time streaming data, there were an endless number of APIs, we struggled with simplifying validation of data, and many more. This series of challenges formulated our idea of what full-stack development is, and raised our problem-solving skills.

In closing, the project met all its targets from a technical perspective and laid the groundwork for future growth to include mobile apps, predictive analytics for financial decisions, and advancing financial services. It highlighted the strengths of the full MERN stack in dynamic and responsive web applications.

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