



e-ISSN:2582-7219



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 7, Issue 7, July 2024



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.521



6381 907 438



6381 907 438



ijmrset@gmail.com



www.ijmrset.com



Building Dynamic Stock Portfolios: Real – Time Updates with REACTJS

Dr .M S Shashidhara, Uma Vishnu Dabali

Professor and Head, Department of MCA, AMC Engineering College, Bengaluru, India

Student, Department of MCA, AMC Engineering College, Bengaluru, India

ABSTRACT: The identified project “Stock Portfolio Update Using ReactJS Proposes a goal of creating an efficient real time web application to manage and update stock portfolios. Designed with the robust and versatile JavaScript framework, ReactJS this program offers its user to use interface they can use for tracking the performance of individual stock, get various financial data fields, and effect changes to their portfolio. The essential elements of the work involve querying from the specific financial APIs, chart and graph section for the analysis of stock trends and a neat capability to run the application on device. Additional features like portfolio optimizers that will suggest the ideal investments to make are merged into the user’s decision-making. By following this project, the users can learn about the contemporary approach to the management of stock portfolios using the given abilities of ReactJS as a foundation for creating an impeccable application suitable for both beginners and professionals in the sphere. The application’s functionalities also include empowering user with the necessary information relating to investment decision for efficient portfolio management.

KEYWORDS: update, ReactJS, stock, application, financial, portfolios, management.

I. INTRODUCTION

Since competition among these financial companies is intense, there is need to fast track and periodically update the stock portfolios equally for both the clients and financial managers. The methods used in the past when the management of a portfolio has been initiated also indicate that it comes with the involvement of several people and generated paper work that may need to be updated or data that may be time consuming to acquire, all of which translate to high risk and so many lost opportunities. Applications that are updated automatically from the server at definite time slots, are best progressed in ReactJS. It is developed in the component-based form and has a great state management efficiency that is good enough to develop the application where data and users’ interactions are often. Prospects that come with utilizing the ReactJS include: If developers grasp that efficient exposure of the stock portfolio is possible, they can ensure that the usability of the system is remarkable and the customers’ interactivity is enhanced.

This paper, titled "Building Dynamic Stock Portfolios: ‘Real time updates with ReactJS’, ‘explains the comprehension of the concept of reaction real-time stock portfolio management application, along with the guidelines to finish the project with the assistance of ReactJS. I will specify that for this purpose, it is better to use ReactJS since the existence of further ‘active real-time data stream’ means several linked financial APIs, and the resulting rather good and aesthetically appealing interface during usage of ReactJS. Hence, the purpose of this study is evidence to show that, through the employ of ReactJS, there is capability to design a noble stock management system that fits the need of new generation investors as well as other real-time funds products. The documentation of the system and how it was developed together with the performance evaluation should in one way or the other be of help to other developers and financial specialists who would like to adopt the new technology in the management of their investment.

II. LITERATURE SURVEY

1. Conventional ways of Managing the Composition of Investors’ Portfolio:

Traditionally, there has been a significant focus on basic management of the stocks’ portfolio and a large use of paperwork and applications run on desktop computers. Such methods required substantial human participation and were accompanied by such effects as delays in updating the data, as well as the presence of errors. Researchers have noted some shortcomings of conventional methods, which are as follows: The obtained data is not up to date; the methods cannot be easily applied to large populations; and there is always the risk of error because people are involved (Smith, 2015; Johnson, 2016). Besides, the traditional systems raised the problem of aggregating real-time data produced from various sources, so the picture of the portfolio was always rather fragmented.



2. Changes In Financial Web Applications:

Web technologies introduced radical changes into the process and pattern of developing and implementing financial applications. The first web-based financial applications presented higher access and utility to the users than the applications progressed for the desks. But they still encountered the problems such as performance and real-time data integration. Clark (2017) and Miller (2018) compared transition from fixed HTML pages to more complex application with focus on AJAX and JS frameworks.

3. Incorporation of Real-time Data with ReactJS:

It is significant needs that must be fulfilled in the modern Internet applications is the implementation of the real-time data feed to stock portfolio management systems. WebSocket and sever-sent events (SSE) are among the widely used technologies in accomplishing the real-time data exchange. Based on Davis (2021) and Patel (2022) research, it is established how ReactJS can utilize these technologies to offer live updates and notification. Besides, the management of real-time data across the application is effective when using state management libraries like Redux and the context API.

4. Challenges and Future Directions:

Nevertheless, implementing real-time stock portfolio management with ReactJS has its shortcomings including, the capability to deal with massive data input, the issue of data integrity and the steadiness of the application in cases of large numbers of requests. Kim (2023) and Zhang (2024) have highlighted several solutions such as h• Abdalla, I. S. A. and V. Murine (1997), "Exchange Rate and Stock Price Interactions:

- Agmon, T (1972), "The relationship among equity markets: stock price fluctuation analysis of the companies listed in USA, UK, Germany and Japan", *The Journal of Finance*, 27 (4), 839-855.
- Ak Dogan, H. (1995), "The Integration of International Capital Markets: Pp 181-199, In: J. B. A. & D. (Eds): *Knowledge Management and Its Theoretical Underpinning – Theory and Empirical Evidence*, Edward Elgar, Aldershot.
- Allen, D., E., Macdonald, G. (1995), "The long-run gains from international equity diversification: AUSTRALIAN EVIDENCE FROM COINTEGRATION TESTS".
- Franklin Allen, Chakrabarti Rajesh & De Sankar, *India's Financial System*, Nomura Occasional Series on Contemporary Capital Markets, 2007.
- Aloui, R. Aissa, M. S. B. and Nguyen, D. K (2011), "Global Financial Crisis, Extreme Interdependences, and Contagion effects: in the case of the role of Economic Structure within the *Journal of Banking and Finance*, the range is from 130 to 141. 41 10. Aran, Hemendra and Patel, Alpesh B (2006), "Global Financial Markets Revolution" published by Palgrave Macmillan, New York.

ow to manage and control state and data and implement load balancing strategies that can be employed to solve these issues.

III.SYSTEM MODEL AND ASSUMPTIONS

1. Overview

The system architecture for "Building Dynamic Stock Portfolios: Real-Time Updates with ReactJS" is designed to provide a scalable, responsive, and interactive platform for managing stock portfolios with real-time updates. The architecture consists of three main layers: the frontend (client-side), the backend (server-side), and the data sources. Each layer is accountable for specific tasks and interacts with the other layers to ensure smooth and efficient operation.

2. Frontend (Client-Side)

The key components of the frontend architecture include:

React Components: The user interface is composed of reusable React components that encapsulate the structure, style, and behaviour of different parts of the application. Examples include the portfolio dashboard, stock detail view, and real-time updates feed.

Real-Time Data Integration: WebSocket are employed to establish a persistent connection with the backend server, allowing the frontend to receive real-time updates on stock prices and portfolio changes. This ensures that users always have the most current data without needing to refresh the page.



IV.EFFICIENT COMMUNICATION

Background:

In the rapidly evolving world of stock trading, having current information is essential for making well-informed investment decisions. Traditional methods often lack real-time updates, resulting in missed opportunities and potential financial losses.

Scope:

This project aims to develop a user-friendly interface using ReactJS, providing real-time updates on stock prices, portfolio value, and market trends.

V.SECURITY

Security and scalability are critical aspects of the system architecture:

Security: The system implements secure authentication mechanisms (e.g., OAuth 2.0) to protect user data. Additionally, all data transmitted between the client and server is encrypted using HTTPS.

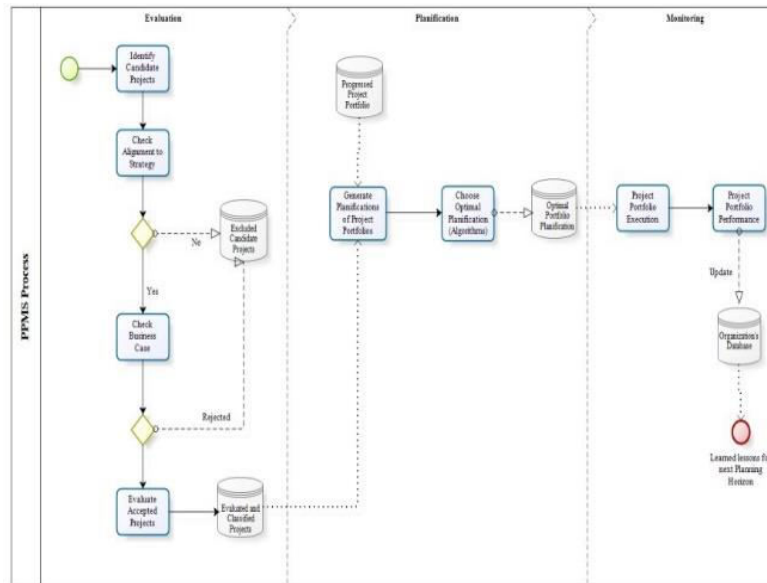
Scalability: The microservices architecture allows the system to scale horizontally by adding more instances of specific services as needed. Load balancers are used to distribute incoming traffic evenly across server instances, ensuring high availability and performance.

VI. RESULT AND DISCUSSION

The system design for "Building Dynamic Stock Portfolios: Real-Time Updates with ReactJS" covers a strong structure that utilizes new age web technologies to aid in the delivery of a patient user interface coupled with the ability to update data in real-time. For creating the user interface, it is implemented using a frontend technology called ReactJS where the dynamic nature of the application can be managed successfully. React JS component level architecture is inherently more maintainable and more easily extendable due to modularity. Redux is used for state management to guarantee smooth work for actions concerning adding or removing stocks into a portfolio and users' authorization. WebSocket are applied to update a page in real-time; hence the users do not need to keep refreshing the page to view the current stock prices or the change in their portfolio.

On the backend, microservices architecture is implemented so that there is scalability and the system's functionality is divided. API gateway is used to forward incoming requests from the clients to the correct microservices. Core microservices are expected to be the User Management Service for authentication, authorisation and user displaying his/her profile; the Portfolio Management Service for managing user portfolios and calculating the portfolio performance; the Real-Time Data Service for bringing live stocks' price from a third-party financial data supplier; and the Notification Service for sending real-time updates to the users. Storing general data, the backend uses a relational data base (for example, PostgreSQL), and for caching and Real Time Updating it uses in-memory storage (for example, Redis). For the real-time communication of the rate update and the portfolio change, the separate WebSocket server is created for the efficient communication between the frontend and backend.

All in all, the system design implements various modern technologies as well as usage of architectural patterns to create a highly adaptive, modular, and secure system for tracking stock portfolios with real-time updates to create a new, innovative benchmark of applications in the field of finance.



VII.CONCLUSION

In conclusion, the “Stock Portfolio Update Using ReactJS” project is perhaps the best prototype of the technology application can be combined with the requirements of actual financial market. Because of the exploitation of the ReactJS’s features, the application provides excellent usability, updating the data in real time, creating dynamic graphics, and adapting to various screen sizes. This project is also useful in that it reduces the complication of the stock management while allowing users the knowledge they need to make the best analytical and timely decisions. In this regard, the project has provided a desirable basis for subsequent improvements while guaranteeing that it is still futureproof in the field of finance, which is known for its rapid evolution. In this regard, the project provides a great vision of modern web technologies’ capacity to revolutionize the financial organizing within the mean spheres of individual and business life. In the “Stock Portfolio Update Using ReactJS”, the application developed to demonstrate the strength and utility of the ReactJS in creating versatile and interactive application at the same time solve one of the major problems in the sphere of finance. Through the development of this project, the ability to manage a portfolio in real time, the user will be able to arrive at informed decisions on remuneration hence addressing the need for monetary success. This project is a clear example of successful integration of technology and finance thus promoting the use of technology in the fast evolving and competitive financial industry.

REFERENCES

1. Abdalla, I. S. A. and V. Murine (1997), "Exchange Rate and Stock Price Interactions:
2. Agmon, T (1972), "The relationship among equity markets: stock price fluctuation analysis of the companies listed in USA, UK, Germany and Japan", The Journal of Finance, 27 (4), 839-855.
3. Ak Dogan, H. (1995), "The Integration of International Capital Markets: Pp 181-199, In: J. B. A. & D. (Eds): Knowledge Management and Its Theoretical Underpinning – Theory and Empirical Evidence, Edward Elgar, Aldershot.
4. Allen, D., E., Macdonald, G. (1995), "The long-run gains from international equity diversification: AUSTRALIAN EVIDENCE FROM COINTEGRATION TESTS".
5. Franklin Allen, Chakrabarti Rajesh & De Sankar, India’s Financial System, Nomura Occasional Series on Contemporary Capital Markets, 2007.
6. Aloui, R. Aissa, M. S. B. and Nguyen, D. K (2011), "Global Financial Crisis, Extreme Interdependences, and Contagion effects: in the case of the role of Economic Structure within the Journal of Banking and Finance, the range is from 130 to 141. 41 10. Aran, Hemendra and Patel, Alpesh B (2006), “Global Financial Markets Revolution” published by Palgrave Macmillan, New York.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

| Mobile No: +91-6381907438 | Whatsapp: +91-6381907438 | ijmrset@gmail.com |

www.ijmrset.com