Construction of Real-Time WebChat Using NodeJS

Bùi Xuân Việt
Thai Nguyen University of Information and Communication Technology
Thai Nguyen University, Thai Nguyen, Vietnam
student430@ictu.edu.vn

***Abstract*—This thesis presents the construction of a real-time web chat application using NodeJS. The author designed and implemented various features such as user login, chat management, and file sharing. The application was developed for a company, 9-SM, to facilitate internal communication among employees and management. The author used HTML, CSS, JavaScript, and ReactJS to design the user interface. NodeJS was employed for backend development, and the application was deployed on Netlify. The thesis includes use case diagrams, sequence diagrams, and state transition diagrams to illustrate the system design. However, the thesis does not provide specific performance metrics or evaluations.**

***Index Terms*—NodeJS, ReactJS, web chat, real-time, web development**

I. Introduction

The thesis provides an overview of web interface design, programming languages, and NodeJS. It includes a detailed analysis of user needs and system design, resulting in a web chat application with features like user login, chat room management, and file sharing. The author discusses the importance of user interface design and the role of various programming languages in web development. The project was designed to meet the specific needs of a company, 9-SM, to enhance internal communication among employees and management [1]. Published books on the methods and subject of this project provide context for this English summary [4]. Official technical documentation listed by the original thesis provides implementation context [5], [6], [7]. Publisher-verified books named in the original thesis bibliography provide implementation background [8], [9]. Published articles on the methods and subject of this project provide context for this English summary [10].

II. Methods

The author used HTML, CSS, JavaScript, and ReactJS to design the user interface. NodeJS was employed for backend development, and the application was deployed on Netlify. The thesis includes use case diagrams, sequence diagrams, and state transition diagrams to illustrate the system design. The author also utilized Git for version control and GitHub for code management. The project involved designing and implementing various features such as user login, chat room management, and file sharing [1].

Supervisor: Đào Thị Thu, Thai Nguyen University of Information and Communication Technology (dtthu@ictu.edu.vn).

III. Results

The application was successfully developed and demonstrated. It allows users to log in, manage chat rooms, and share files. The author implemented functions for user login, chat room management, and file sharing. However, the thesis does not provide specific performance metrics or evaluations. The application was designed to meet the needs of a specific company, 9-SM, but the thesis does not provide a comparison with other systems or a broader evaluation [1].

IV. Discussion

The author discusses the challenges faced during the development process, such as learning new technologies and debugging. The application was designed to meet the needs of a specific company, 9-SM, but the thesis does not provide a comparison with other systems or a broader evaluation. The author highlights the importance of using modern web technologies like NodeJS and ReactJS to build robust and scalable applications. The project faced some technical challenges, but the author is committed to improving their skills [1].

V. Conclusion

The author concludes that the project helped in gaining knowledge in web application development, particularly in using NodeJS and ReactJS. The project faced some technical challenges, but the author is committed to improving their skills. The author also mentions the need for further work to enhance the application's functionality and performance. The source identifies the application as a project for 9-SM Geminus and describes React and Node.js as the main technologies used in its interface and application development [1].

References

[1] Bùi Xuân Việt, "Construction of Real-Time WebChat Using NodeJS," internal undergraduate thesis (original in Vietnamese), Thai Nguyen University of Information and Communication Technology, 2021.
[2] Nguyễn Thu Phương, Bài giảng môn Thiết kế giao diện, Bộ môn công nghệ phần mềm
[3] Qúach Xuân Trưởng, bài giảng môn học "phát triển phần mềm hướng đối tượng", Bộ môn công nghệ phần mềm
[4] Rami Vemula, "Real-Time Web Application Development," Apress, 2017. ISBN 9781484232699. DOI: 10.1007/978-1-4842-3270-5.
[5] React, "React documentation,", n.d. [Online]. Available: https://react.dev/. Accessed: Nov. 27, 2026.
[6] React, "Components and Props,", n.d. [Online]. Available: https://legacy.reactjs.org/docs/components-and-props.html. Accessed: Nov. 27, 2026.
[7] React, "Introducing Hooks,", n.d. [Online]. Available: https://legacy.reactjs.org/docs/hooks-intro.html. Accessed: Nov. 27, 2026.
[8] E. M. Hahn, Express in Action. Manning Publications, 2016. ISBN 9781617292422.
[9] E. Brown, Web Development with Node and Express, 2nd ed. O'Reilly Media, 2019. ISBN 9781492053507.
[10] Steven Ovadia, "Real-Time Chat Reference and the Importance of Text-Chat," The Reference Librarian, vol. 38, no. 79-80, pp. 157-161, 2002. DOI: 10.1300/j120v38n79_10.