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School of Computer Science Engineering & Information Systems (SCORE)
Department of Computer Applications

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ITA6099 – Off-Campus Internship

Third Review Report

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Project: A React and Express Web Application

Front End: React, Tailwind CSS

Back End: Express.js, MySQL, phpMyAdmin, Hostinger

Tools: Git, VS Code

Technology used

- **Project Overview**

  After the Enterprise System, I have been assigned to another client project. In this project, the client is a college, and we are tasked with fixing some bugs and implementing new features in their existing web application. The web application is built with an Express.js backend and a React frontend, with Tailwind CSS for the user interface.

- **Technology Stack**

  JavaScript:

  JavaScript serves as the primary language for both server-side scripting and business logic. Using the same language on both frontend and backend with the help of Node.js greatly facilitates development. The extensive community support, numerous libraries, and readily available resources on platforms like Stack Overflow contribute to efficient and rapid development.

  Frontend

  React.js:

  Serves as the main frontend library for building dynamic web applications systematically. It helps in controlling each part of the webpage dynamically without refreshing the entire page. For this, it uses virtual DOM, making operations efficient.

  Tailwind CSS:

  Tailwind CSS is chosen for its rapid development features and ease of integration with React. It facilitates fast development without affecting the backend, making it a preferred choice within the community.

  Backend

  Express.js:

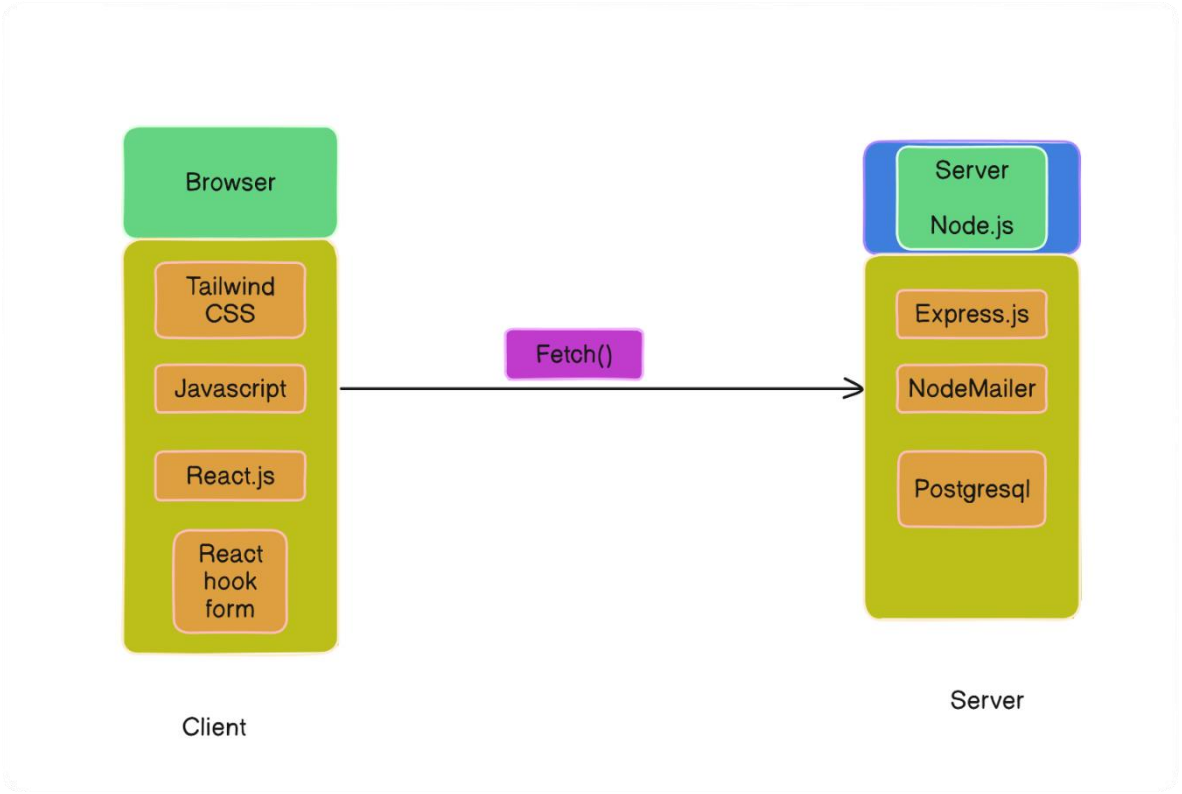
  we are using Express.js, which connects with the database and sends data to frontend React. It acts as an API for the frontend part. This library helps in connecting with the database easily, building RESTful APIs, and ensuring secure data transfer. Many libraries, such as Nodemailer, are utilized with Express.js.

PostgreSQL
For database storage, we are using PostgreSQL, a relational database, with Sequelize as an ORM.

- **Hosting platform**

  For the hosting platform, we are using Hostinger.

Architecture



Testing

Unit Testing

Unit Testing involves testing individual units or components of a software application in isolation to ensure they function as expected. It focuses on verifying the correctness of small, atomic sections of code, such as functions or classes. Unit tests are automated and help detect defects early in the development process, ensuring code quality and facilitating refactoring.

Integration Testing

Integration testing verifies the interactions and interfaces between different units or modules of a software application when they are combined and tested as a group. It ensures that the integrated system functions correctly by testing data flow, communication between components, and overall system behavior. Integration testing helps identify issues that may arise when integrating different parts of the application, ensuring seamless operation of the entire system.

React Testing library

For testing React components and functionality, we are using the React Testing Library and writing a combination of unit and integration tests for the web app. Unit testing ensures individual components work correctly, while integration testing checks the interaction of multiple components.

Problem Solving:

- **Bug Fixing ability:**

  I was tasked with fixing bugs such as page layout issues on mobile, images not displaying correctly, and incorrect data fetching. This improved my ability to identify and solve bugs effectively.

- **Adding New Features:**

  I learned to seamlessly integrate new features into our application, collaborating with teammates and ensuring compatibility with existing code. For instance, I added a feature to display urgent notices on the homepage.

- **Learning the Usage of Correct Tools Based on Situation:**

  I learned to identify and employ the correct tools based on the situation, ensuring optimal productivity and effective problem-solving.

- **Problem-Solving Strategies:**

  I approached challenges with analytical thinking and creativity, systematically analysing root causes and exploring solutions to drive continuous improvement.

  I successfully completed all tasks, receiving credit from my team leader for delivering them early. This experience has enhanced my debugging and development speed and deepened my understanding of React and Node.js lifecycles.

project performance and Technical Skills Development:

- **Project**

  So, after the Enterprise System, I am assigned a client web application. A client is collecting for which we are handling their complex web app. The web application is built on Express.js backend and React as frontend and Tailwind CSS as UI.

- **Performance:**

  So I was tasked to improve certain UI and fix certain UI bugs, then I was assigned for the React part, where I had to implement some features. I successfully completed all my tasks and was able to deliver them by thoroughly testing and on time, for which I got credit from my team leader for completing so early. So as of now, I have got the hang of all the projects which are under mine, which continually improves my debugging as well as development speed, and I got familiar with the overall of React and Node.js lifecycle.

- **Skill Development:**

  Frontend: For frontend, we were using React, so I had to revise the JavaScript first, which I learned in MCA batch, then I also had to go through React concepts. But I have learned some new things like how to use fetch API for fetching the data from the backend, how frontend and backend connect using an API, and also learned instead of writing from scratch if there is some library I can use that also but the condition is I have to thoroughly check if it's correct and open source. I had to build some forms also for which I used the React-Hook form. So overall I learned all the things required to build a frontend in React.

  Backend: For the backend part, we were using Express.js. This part was mainly handled by another backend developer, but I also got the chance and permission to see how the backend framework works by working with it with a simple case. Mainly I had to understand all the model architecture and all models which are written with Sequelize which is an ORM for MySQL. Because before fetching the data in the frontend I needed to understand how the model is written. I also got familiar with Nodemailer which sends mail to the users. I have also written some test cases using React Testing Library. So overall after working on a real project, I got how development lifecycle works and how to fix the bug based on criteria and how to collaborate with each other in real-time.

Conclusion:

The development of this web application using reat.js and exprss.js and nojde.js serves as a prime example of how the quantity and quality of project work, combined with strict adherence to engineering standards, contribute to the success of a project. The outcome is a reliable, scalable, and secure solution that meets the organization's requirements while aligning with industry best practices. I continue to learn and improve my skills, including programming, communication, collaboration, and expressing ideas, through this experience.

Signature (Student)

Signature (Guide)