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**Capstone Project**

**Case Study and Software Review**

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## Introduction

The purpose of this document is to review code from the open-source project freecodecamp. Freecodecamp is a website that is 100% open source and free to use. The purpose of the site is to teach beginner, intermediate, and advanced programmers topics ranging from multiple coding practices. Web design, both front end and back end, machine learning, data analytics, and many more all 100% free. The site creators can achieve a free to use service by relying on open-source contributions from their community. I have chosen this as my Case study and software review for these reasons.

## Design

The design of the site utilizes multiple resources that are all converted into native Typescript. The creators achieved this by developing a web-based development application that utilizes Node.JS, application for running JavaScript locally, and MongoDB which is used to run a server on the local browser of your choice. This creates an easy-to-use interface for those who would like to contribute but are not familiar with the GIT interface (Another application utilized for the site). The interface utilizes markdown files that are then read by TypeScript to convert into JavaScript code. Overall, the design is very simple to allow anyone to contribute to the open-source repository.

## Comments

Comments are not well documented in the code of the application but rather in markdown files that correspond with the code. I do not agree with this type of documentation as it can be confusing to track down needed information just to update one line.

## Code readability

The code readability is by far the easiest part of the process. Since all code is written in markdown and then converted to TypeScript with the assistance of JavaScript, designers have the option of writing nearly identical English language, or in the language they are most comfortable with. Since markdown is the most common text formatting in the world it is very easy to learn and simple to understand.

## Safety and Security

The open-source repository is managed by contribution administrators. These administrators are selected based upon contributions to the project and overall longevity of the project. All pull requests are reviewed by these admins. There are multiple applications utilized to review the code base and ensure safety and security of the site. Afterall this is free to use and maintaining a safe and secure website is top priority. Socket Security, codefactor.io, CL – Cypress (e2e), and a custom i88n – Curriculum PR Validation are just a few applications that automate the review process. After all reviews pass, an admin is required to verify these tests were performed successfully. If not, then they are required to manually review the code that was missed. If successful, then only the admin assigned to the review can approve the migration of the purposed pull request. The process is very through and strict making the site safe and secure.

## Performance

The performance of the released website is fast and responsive. However, the performance of the code editing GUI is not. With the number of applications required to run the software locally it can take some time to get started editing anything. Then when you can update a line or more you must completely refresh the project which takes more time away from development. This is all done for the purpose of security and to verify functionality as websites regularly require refreshes with requests.

## Conclusion

The open-source project is easy to contribute to and has a robust and secure process to ensure delivery. However, the performance to run the editing software for the application is slow and requires a bit of knowledge for navigating the code as documentation is, for lack of a better word, scattered throughout the project.