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CSCI 370 Final Report

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Table 1: Revision history

Revision	Date	Comments
New	5/15/2023	Completed Sections I, II, III, IV, V, XII, and References.
Rev – 2		
Rev – 3		

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I. Introduction

In 2014, Chevron hosted internal, Kaggle-style, data science challenges, which would allow employees to practice and grow their data science skills. As such, a custom site was built to manage participant submissions and share the leaderboard of participant scores. The issue with the website was its outdated nature and limited functionality which prompted its need for replacement. The purpose of this project is to build an updated full-stack website that allows for easier maintainability for admins and users. This will include updating existing account management and leaderboard information. The team will also add new functionality such as password resetting for both the admins and the users with complexity (which means that it will require users to add special characters, capital letters, etc.), allowing for users to submit their code into the website rather than sending it to be graded via email, and the option for having multiple challenges open at once. Our client from Chevron, Kevin Raber, had been maintaining the platform since 2018 and wanted an updated website as he had been doing several tasks manually such as collecting submissions and storing user information into .csv files. As he was the primary individual who managed the website, he wanted ease of access and maintainability as he could not spend his full time on updating this website. The website was created by a former intern and is originally based on Shiny R as the front-end and the back-end was non-existent as Kevin had spent his time putting the information into .csv files. As previously mentioned, this website is hard to maintain and time-consuming which is why there is a need for an updated website. The stakeholder for this project is Chevron and more specifically, Kevin. He will also be responsible for maintaining the website after the project is completed.

II. Functional Requirements

The functional requirements are centered around optimizing data management for the challenges while concurrently presenting a more functional front-end website that is both user and admin friendly. This implies a heavy emphasis on back-end development, specifically with Docker in order to store and update data about users and the leaderboard. The project requires the product to store information in databases that can be easily accessed and modified. On the front-end with Angular, it is expected to behave similar to the website's current iteration while improving and expanding

the available functionality. Some of the specific functionality requested was the ability to somewhat optimize account management like changing passwords from both admins and users.

Some overhead requirements that influence the project's individual parts is how dependent each part is upon each other. In order for the website to be fully functional, the databases and back-end tools must be working properly. Similarly, the databases and back-end tools can only be verified to be working as expected by developing the correct front-end mechanisms to connect to and work with them.

III. Non-Functional Requirements

Fortunately, there are quite minimal non-functional requirements that have been found for this project. It is relatively lightweight; The current instance of the website is running on a single processor core and less than 2GB of RAM. We expect our implementation to consume the same or even less resources than this one. Additionally, there are no cost constraints or important reliability concerns (other than making a generally stable,bug free product) regarding this project. Our clients have suggested certain technologies for us to use, including Angular and Docker, but specified that they are not required.

One area that does need to be focused on is the storage and complexity of user passwords. In the old website design, there are no password characteristic requirements and they are simply stored as a hash value in a non-encrypted CSV file. Our team is planning on using a more sophisticated structure for password storage (in a database), which will hopefully satisfy these concerns.

IV. Risks

A. Technology Risks
   - User data including Full names, emails, and password hashes will be stored in database locations. we need to make sure that this database has permissions in place to ensure the confidentiality, integrity, and availability of this data.

B. Skills risks
   - We are not comfortable in the coding language, Angular, nor do we have much experience with Docker (which are the suggested technologies to be used by Chevron)
   - Our team has experience with pSQL and MongoDB, but we are not sure which one is best fit for completing this project

V. Definition of Done

Our client is expecting a product that is more intuitive and feature-rich than their current implementation; This means that we will deliver a full-stack web program that lives inside of a docker container. Its components include a front end web interface, database system, and processing handler for user submissions. Assuming our product is, at minimum, as reliable as the current website, has all existing basic functionality as the current version, and has additional functionalities, the product is done. These additional functionalities include password changing and complexity requirements, miscellaneous admin controls, multiple competitions at once, and a more sophisticated database mechanism. Additionally, we will provide ample user and technical documentation for all aspects of the stack. The client has requested some additional optional features, which will be added if and only if time allows for implementation.

VI. System Architecture

VII. Software Test and Quality

VIII. Project Ethical Considerations

IX. Results

X. Future Work

XI. Lessons Learned

XII. Team Profile

David Young

Junior in CS

Hometown: Louisville, Colorado

Work Experience: Tutoring High School Students in Math, Retail Worker

I am excited to see how far we can accomplish in this project. It will be neat to see how our client can use our project to help them have easier maintainability

August Vendegna

Senior in CS

Hometown: Castle Rock, Colorado

Work Experience: Town of Castle Rock IT Intern

I am looking forward to learning the technologies that are required for this project. It is exciting to know that my skills are practical for use on professional tasks

Kongmeng Lor

Junior in CS

Hometown: Superior, Colorado

Work Experience: Barista

Always happy to be contributing to a project that can contribute to a wider scope of people than those in my vicinity. I'm hoping to get more hands-on experience with software development and working with like-minded individuals to create a more complete product.

References

Appendix A – Key Terms

Include descriptions of technical terms, abbreviations and acronyms

Term	Definition
Complexity	*[1] The requirement and details specified by the client in an effort to make a user's password secure.*