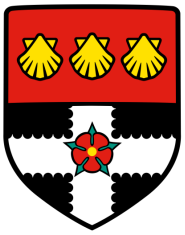

University of Reading

Department of Computer Science

E-LOGBOOK

CS3IP16: Individual Project

FortiVault: Architecting the Future of Digital Security through Password Management

Created by:

30021310

PROJECT OVERVIEW

The project "FortiVault: Architecting the Future of Digital Security through Password Management" aims to address the critical issue of password security in the digital era. It presents an advanced password manager, FortiVault, designed using cutting-edge web technologies like Next.js 14, Prisma, PostgreSQL, Supabase, OAuth 2.0 with Google, and NextAuth for secure authentication. The project highlights the increasing importance of secure and user-friendly password management systems due to the rising threats of data breaches and unauthorised access. FortiVault stands as a testament to combining modern web development and cybersecurity principles to enhance individual password security and contribute to the broader discourse on personal data protection in the digital landscape. Some of the project objectives and expected outcomes include:

The project, FortiVault, is designed to bolster digital security through an advanced password management system, addressing the escalating challenge of cybersecurity in the digital age. Aiming to mitigate vulnerabilities in existing password management solutions, FortiVault integrates cutting-edge web technologies—such as Next.js 14, Prisma, PostgreSQL, Supabase, OAuth 2.0 with Google, and NextAuth for authentication—to construct a secure, user-friendly platform for managing sensitive user passwords.

Objectives of the project include:

- Analysing weaknesses in conventional password management systems to enhance security.
- Employing modern web technologies for developing FortiVault, ensuring a blend of robust security measures and user-friendly experience.
- Evaluating FortiVault's effectiveness against common cyber threats through comprehensive testing.
- Enhancing user experience without compromising security, facilitating broader adoption of secure password management practices.

The outputs of the project encompass the development of FortiVault, which showcases secure architecture, seamless user experience, and advanced authentication mechanisms. It proposes a practical solution for individual password security, contributing significantly to the discourse on personal data protection. By addressing both technical and user-experience aspects, FortiVault sets a new benchmark in password management, offering a sophisticated tool that aligns with the current needs of digital security.

WEEKLY LOG ENTRIES

Week 1 (22 Jan 2024 – 28 Jan 2024):

I started off the project by identifying the project scope, objectives and considering my existing knowledge of technologies in order to develop a project plan and establish a timeline.

Week 2 (29 Jan 2024 – 4 Feb 2024):

I looked at existing password management solutions and different cybersecurity threats. I also looked at the different features which would be suitable for an application of this standard. This helped me to gain key insights on the strengths and weaknesses of existing systems and industry leaders and formed the basis of my application.

Week 3 (5 Feb 2024 – 11 Feb 2024):

As I started this project relatively late I decided to build this application using technologies which I have experience using but making sure to consider other factors such as security,user experience and price. This led to deciding on Next.js (a framework built on top of React that provides additional features such as server-side rendering and automatic code splitting). Prisma and Supabase(free alternative to Firebase), OAuth 2.0 , etc. This allowed me to install the necessary packages and have a clear visualisation of my tech stack as well as a solid justification for my choices. Aftrwhich, I started working on coding and implementing features.

Week 4 (Reading Week) (12 Feb 2024 – 18 Feb 2024):

Since this was a week without lectures and having my week 6 demo, I worked tirelessly to ensure the application design had been created and I had reached a decent level of completion based on the features. I had created the sign-in, sign-up and password pages and also worked on implementing the OAuth 2.0 to allow users sign up/sign-in using their gmail accounts. I also worked on the algorithm for password generation and encryption/decryption.

Week 5 (19 Feb 2024 – 25 Feb 2024):

This week. I was mainly focused on testing and ensuring the application was working to a good standard as I had my week 6 Demo and wanted to make sure I had a good level of work to present. There were still some additional features such as email verification and password forgot/reset but I set those for the next week.

Week 6 (26 Feb 2024 – 3 Mar 2024):

This week I really did not do as much as I wanted as I had some other coursework due. I was still able to do some more research on the process for email verification and password forgot/reset.

Week 7 (4 Mar 2024 – 10 Mar 2024):

This week I created the email for the application and I successfully implemented the Email verification and password reset features. I could not do much more as I had two other courseworks due.

Week 8 (11 Mar 2024 – 17 Mar 2024):

This week I focused more on brushing up the application and ensuring all the features were working as intended. Also, I worked on the design of the app and made sure the app had a clean look. This was geared more towards user experience and app usability

Week 9 (18 Mar 2024 – 24 Mar 2024):

This week, I was focused on deploying the application on Vercel and getting my user feedback methods prepared.

Week 10 (25 Mar 2024 – 31 Mar 2024):

This week, I started writing the final year report and making sure the application was well documented in the report. I also sent out the app to specific users to make use of and give their honest opinion on the app.

Week 11 (1 Apr 2024 – 7 Apr2024):

I continued working on writing my final year report and collecting user feedback.

Week 12 (8 Apr 2024 – 14 Apr 2024):

I worked on the presentation and demonstration for the project and also completed any forms/documents necessary for this module.

Week 13 (15 Apr 2024 – 16 Apr 2024):

I uploaded every document necessary to the project to the gitlab repo and also pushed the code for the project and finally submitted my work for this module.