Camosun College Capstone Project

Wayfinder

Final Report

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Project Description

Wayfinder is an application that assists citizens in locating the services they require while also providing accurate information about provincial service locations. Wayfinder, as opposed to relying on third-party solutions such as "Google Maps," directs users to public-facing government offices, ensuring a more reliable and relevant search experience.

Wayfinder displays the user's current location on an interactive map and dynamically displays requested offices by service type, such as "Service BC" or "Hospital." Users can also search for locations based on the service they require, such as "Driver Licencing."

As a Progressive Web Application (PWA), Wayfinder combines the functionality of a regular webpage with that of a native app. It can be installed on devices, allowing offline access and continuous user functionality. Wayfinder takes advantage of this offline accessibility by including a set of map data stored on the device, ensuring access even in remote areas.

Wayfinder features a user-friendly interface that is easy to navigate, ensuring a seamless and efficient experience for users. As an application developed for the BC Government, Wayfinder offers distinct advantages over competitors by providing accurate and up-to-date information, serving as a reliable source of truth.

Project Goals and Objectives

The project aimed to develop an Agile product support environment using the IMB's preferred tooling to enhance service delivery and citizen experience. The team successfully accomplished the project's core objectives, including:

1. **Agile Product Support Environment**: An Agile product support environment was established, leveraging the IMB's preferred tooling. This environment streamlined development processes and enabled efficient collaboration.

2. **Knowledge and Code Repository**: A centralized knowledge and code repository was created to store all project documents, solutions, and code. This facilitated easy access, collaboration, and knowledge sharing among team members.

3. **Containerized Solution for Private Cloud**: The team developed a containerized solution that was successfully deployed to the BC Government's private cloud environment. This ensured scalability, security, and seamless integration with existing systems.

4. **Suite of Self-Describing Common Components**: A suite of self-describing common components was built, fostering reuse, and accelerating future development efforts.

Goals Achieved

Goal 1: Requirements and Design (Completed on June 30th, 2023)

- The team developed a comprehensive project outline and design, providing clear direction and scope for the development process.
- Platform knowledge transfer was successfully conducted, equipping the team with the necessary skills to utilize the selected tools effectively.
- System specifics and User Interface (UI) were thoroughly designed, resulting in a user-friendly and intuitive application.

Goal 2: Development (Completed on July 12th, 2023)

- Citizens/users were empowered to self-install the mobile application, improving accessibility and user empowerment.
- A "what's new" view was implemented, allowing users to stay informed about the latest improvements and offerings.
- Users were provided with a list of services and service locations, facilitating easy access to relevant information.

Goal 3: Refine and analytics (Completed on July 26th, 2023)

- The team redesigned the settings to improve the feel for modern mobile devices.
- The team utilized PowerBI, enabling the IMB to gain valuable insights into application usage and performance.

Goal 4: Hand-off (Completed on July 28th, 2023)

- A final demonstration of all system features was conducted, validating successful development and functionality.
- Comprehensive handover documentation was prepared, ensuring a smooth transition and effective knowledge transfer.

<u>Final Requirements Met for Success:</u>

1. **Consistency and Reliability**: The solution provided consistent and reliable information to citizens/users, building trust and confidence.
2. **User-Friendly Application**: The application was designed with a user-centric approach, ensuring ease of use for non-technical users.
3. **Built for Reuse**: The application was developed with modular and reusable components, facilitating future extensions and updates.

4. **Hostable in Distributed Environment**: The application was designed to be hostable in a distributed environment like the BC Government's OpenShift environment, ensuring scalability and adaptability.

Through the successful completion of the project goals and objectives, the team has significantly improved service delivery and citizen experience, achieving the desired outcomes for the IMB and the citizens of British Columbia.

List of Deliverables

Original Deliverables

The core deliverables of Project Wayfinder are the creation of a suite of common components and their respective documentation in the form of a progressive web application that can be reused or referenced by the department in future decision-making, planning, and development. The common components must include the following:

- An agile product support environment utilizing the IMB's preferred tooling.
- A knowledge and code repository containing the document's solution.
- A containerized solution deployed to the BC Government's private cloud environment.
- A suite of 'common components' that are self-describing to foster reuse.

Current Deliverables

Thanks to the sponsor's and scrum master's support, Team Wayfinder accomplished all the deliverables that had been set. They even raised the bar by adding additional out-of-scope functionality to the application in each sprint, which impressed the Product Owner.

In addition to the original deliverables, Team Wayfinder added additional functionality for viewing past reports, letting designated users access stored analytic data securely, and adding support for multiple languages.

Development environment

The Wayfinder application was developed using a three-tier architecture model, employing the MERN Stack (MongoDB, Express.js, React, and Node) with TypeScript configurations. The development environment utilized Git, Node, Visual Studio Code, and Docker Desktop for containerization. Additionally, specific Visual Studio Code extensions, including ESLint and Prettier, were used to optimize the development experience and maintain code consistency.

Implementation environment

The Wayfinder application is created in a way that it can be easily hosted and run in a distributed environment, such as the BC Government's OpenShift environment. This design choice allows the application to scale and adapt effectively as the user base or workload increases. In a distributed environment, the application's components can be spread across multiple servers or containers, which helps in managing high traffic and provides better performance and reliability. This scalability and adaptability make the Wayfinder application well-suited for handling many users and dynamic workloads.

Successes and lessons learned

Dallas Richmond

During the initial two sprints, Dallas struggled with time estimation and task planning, leading to rushed work before each sprint's deadline and increased stress. To improve Dallas' performance, he proactively addressed these challenges and worked to enhance his time management and planning skills. Dallas' goal was to complete tasks more efficiently and eliminate the pressure of last-minute crunches. To achieve this, he prioritized his tickets on the first day of each sprint to increase his likelihood of completing them early as well as identify any potential blockers before they occurred. As a result of Dallas improving his understanding and time management, he started to complete assigned tickets ahead of schedule, oftentimes finishing early and taking on additional unplanned tasks. This not only relieved the pressure of the end-of-sprint crunch but also enabled him to routinely take on additional work from the backlog. Ultimately, this led to higher-quality work, and allowed Dallas to be available for assistance to other team members if necessary.

Dallas successfully achieved his goal of managing Docker images and containers for the Wayfinder application. Collaborating with other IMB members, Dallas gained a deeper understanding of Docker, which was then applied to the Capstone Project. With the experience gained this semester, Dallas is confident in his ability to meet his second goal of creating a Progressive Web Application of his own by the end of the year.

Matthew Logan

During the second half of the Capstone Project, Matthew further improved his ability to act as Team Lead for Wayfinder. With the support of the Product Owner and Scrum Master, Matthew guided the team through each sprint cycle, creating well-defined user stories and developer tickets in JIRA. Matthew's allocation of tasks reduced conflicts and dependencies, resulting in an efficient and well-coordinated team. The collective efforts helped bring Wayfinder to fruition, surpassing the initial project goals. Matthew's leadership enabled the team to impress the Product Owner by delivering additional out-of-scope features, creating a more well-rounded product.

Matthew successfully achieved his learning goal of improving his teamwork abilities by helping foster a collaborative environment within the team. Matthew worked to improve the team's organization to help team members work independently by making clear and detailed tasks.

Tyler Maloney

As the Capstone Project progressed, Tyler's proficiency in TypeScript and React steadily improved, enabling him to implement various front-end components effectively. Tyler dedicated time to familiarizing himself with essential technologies like LeafletJS, the creation and storage of map tiles, and various device storage strategies. He also immersed himself in the creation of other reusable components to enhance his skillset. By investing time in researching and practicing, Tyler experienced an increase in his development speed and a reduction in errors. This led to more independence, showcasing his growing aptitude for TypeScript and React. Tyler's growing proficiency in TypeScript and React played a significant role in the success of the Capstone project by developing key functionality. Tyler's efforts contributed to his overall professional growth, making him a more capable and competent developer.

Tyler set a goal to enhance his familiarity with front-end development, along with improving his planning, programming, and soft skills. Through diligent efforts and the support of his team, product owner, and scrum master, Tyler successfully achieved his objective. Tyler's determination and commitment to personal growth have had a positive impact on his abilities as a developer.

Tying it all together

What technologies/concepts that you learned in the program were useful to your project?

- We were taught the basics of React which was fundamental for the development of the Wayfinder application.

What technologies/concepts did you learn for your project that was aided by what you learned in the program?

- We learned JavaScript within the ICS program; this was a stepping stone to us learning TypeScript as the primary programming language for the Wayfinder Application.

What technologies/concepts should we have taught in the program? i.e.: web technologies, source control systems etc (not specific languages)

- We believe students should get more exposure to containerizing their projects using technologies such as docker.