E2 - Shannon Trust Web App

1 - Intro

The Shannon Trust Web App is a product that Yalla has been developing for over a year. I have worked on it before, developing both the front and back end. The product itself is for the Shannon Trust charity, which is a prison reading charity.

1.1 - What is Web App?

A website is defined as, *"a site, or a group of sites that can be found on the Internet, accessed via a Web App is simply a website that is used like a piece of tech. Some of the ways in which the Shannon Trust also back from the browser to the user.*

Web Apps are important because they are accessibility and interactive elements. Other Frameworks, Libraries and Tools are used to make Web Apps are dynamic, and feel like an native app.

2 - Project Management

2.1 - Working Asynchronously

Yalla's approach for the Shannon Trust Web App I worked asynchronously with my team, which means that my team did not need to be online for me to be able to work on it. Instead, I would write up what I did, what I was working on and what I was blocked on in a Google Doc. Tutorials and Demos of work to be reviewed are made in Loom, which is difficult to work asynchronously with, as it requires someone to watch a video, and then write a response, which is time consuming. The only exception to this is our daily stand up, this is a short meeting from 9:30 - 10:00 GMT where we discuss what we did the day before, what we are working on today, and any blockers we have.

Gather Gather is a virtual office that feels as if you are in a 2D pixelated game, or in Stardew Valley. It is a virtual space, where we can see who is in the office, who is busy, have meetings and chat to people together. We continued our daily stand up in the meeting room and have ad-hoc meetings in the office. Gather is also a virtual space that we use during Lunch and Friday Drinks.

Discord Discord is a text and audio application that enables organisations to have discussions over voice, video, and text. We use discord for messaging each other and making announcements in the Shannon Trust Web App Discord Server. Discord has a lot of features, such as having messages for different topics and can ping, or tag, a group of people, which I find very useful.

GitHub Use GitHub as a remote repository for the code I write, including the Shannon Trust Web App. I use GitHub Projects to track what I am working on, what issues I have, and what issues I have closed and which changes from other branches I need to pull in. Each GitHub issue is assigned to a Sprint, which is a set of issues that we need to complete in a set time period. I use documentation for projects using markdown.

Figma Figma is a tool for UI and UX. I like to learn and discover new things. Gather has a great dashboard which shows for what my friends and spaces are mentioned in. I often find pain points and ask how could Gather have done this better in the future.

2.2 - User Journeys and Issues

An important part of software development is to read through the all the user journeys and work with my Scrum leader to divide them up into issues. A user journey is the path taken by the user to achieve a goal, for example, the user journey for a Volunteer is:

Volunteer Sign Up - Volunteer Training - Volunteer Dashboard - Volunteer Profile - Volunteer Sessions. Each of these features and changes that needed to be made to the existing code-base. these could then be broken down into front and backend issues and allocated to the developers in the team.

I used GitHub as a remote repository and also a place to store and assign the issues that were created from the user journeys. I used GitHub Projects to track what issues I was working on, what issues I had closed and what issues I was working on in a Sprint. I have found GitHub Projects to be a very useful tool for tracking issues and projects. The "Backlog" column means the product backlog, the highest priority of product that are not being worked on.

3 - Docker

3.1 - What is Docker?

Docker is a software platform that enables developers to package up their code along with all of its dependencies into a container, which can then be run on any machine that has Docker installed. This means that it will work the same on other peoples machines, including their operating system. This makes the process of software can be 'containerised' and then deployed, run and updated from any machine. Containers are like a lightweight version of a VM, they share the host machine's operating system and kernel. Tools such as Docker Hub and Docker Compose can be installed and use a broad ecosystem of tools.

Containers are a process like Docker and other containerisation applications can be written once and run anywhere. Containers are also advantageous due to deployment speed. Containers also help when deploying to a server, other applications can work locally but not on the server, containers can be deployed to the server and run the same as they did locally. Containers are also lightweight, so they are quick to start up.

3.2 - Docker and the Shannon Trust Web App

I use Docker on my machine to run the Shannon Trust Web App. In Yalla there are also several different operating systems used for development. Docker enables me to be able to work on the project without installing Node.js, Python, Postgres, etc. on my machine. I can just run the Docker Image and the Docker Image handles the dependencies and configures them to better understand how it works.

I use multiple volumes inside a single container, each volume contains part of the application source code and dependencies.

4 - Front-end

The design of the UI has been completed before I started working with Yalla. I joined them at the beginning of the development of the Shannon Trust Web App, so I was working with the UI designer on a regular basis from the start. I like to be involved in the design and collaborating with designers is tiring but up to speed.

4.1 - Modular UI

I developed the user interface for mobile phones before desktop, the design for mobile had been a priority as we develop on mobile where the development cycle is quicker.

5 - Front-end

I also used progressive enhancement to ensure that the site worked well on all devices, adding more functionality and complexity as the screen size increased. I used Tailwind CSS for styling.

Developing for mobile first means having the site work on smaller screens before desktop. Tailwind CSS makes this easy, as it is a mobile first framework. Tailwind CSS also makes it easy to add responsive UI, such as hiding and showing elements, changing the flex direction, or hiding or focusing on smaller elements with less power that means that scaling up to desktop is easier than scaling down from desktop.

5.1 - Emulator

Emulator is a tool that allows for running iOS Apps with Linux Javascript. I used Shaun Arrington's Emulator to develop the Shannon Trust Web App, which is a Progressive Web App (PWA) Writing CSS in Javascript means that functions or conditional statements can be used to change the CSS depending on the OS.

For example, Safari is a browser on the application that has different background colors depending on the OS, Safari on iOS has a blue background, Safari on macOS has a grey background. Emulator allows for the application to be ported over from the background color source and for accessibility, whereas it would default to blue.

Using Emulator enabled me to reduce the amount of repetition in my code and make my components more flexible and reusable. Instead of having two versions of a button, one for iOS and one for macOS, instead of a many different phones and tablets, Writing in this way enabled me to keep the front-end consistent and more maintainable.

5.2 - React

I used React in the front-end for its ability to manage state. React allows for values to be stored, changed and rendered in an efficient manner.

For example a button that counts how many times you have clicked it and displays that count in the button. Without a library like React, I would need to find the button in the DOM, find the text inside and change the text. However, we would then have the page to display the new value, being carefully developed this would be very difficult to do, the function would be and would update the text, but what if we want to change the colour?

React makes a single page app a lot easier to develop, these components can be displayed conditionally and make the pages feel like they load instantly.

5.3 - Redux

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5.4 - Database

I used Supabase for my database, Supabase is a PostgreSQL wrapper, which is a relational database. I used the Supabase Client Library for Javascript to connect to the database from the front-end. Supabase is quick and easy to set up and has a generous free tier. Supabase also has a GUI that allows for the creation of tables and for the manipulation of the data. Supabase also has a CLI that allows for the creation of migrations and for the manipulation of the database locally.

I Followed a process of testing each page individually and repeating every step with each page. I used Postman to test the API endpoints. Postman is a tool that allows for the end-to-end automated testing of the endpoints.

I wanted to ensure the web app was accessible, so that all of our potential users, including people with disabilities, had a great user experience and were able to easily access lessons and tests. I used the Lighthouse Tool in Chrome DevTools and Google Wave and Axe-Core to ensure accessibility. WCAG 2.1 AAA was used.

We use Cirrus to run tests on changes in one place, when I push code to our remote repository, Cirrus runs the code against various tests.

6 - Accessibility

Accessibility was important to this project as it was to be used by prisoners who are unable to read or understand very difficult sentences.

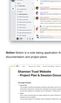
6.1 - Audit

I conducted an accessibility audit on all of the Shannon Trust Web App, I discovered issues with level descriptions, I tested the application using VoiceOver, which highlighted areas which did not work well with VoiceOver. I ran Lighthouse on the application and fixed issues that were found.

6.2 - Perfy UI

Following on from conducting the audit I wanted to ensure that all future changes were also accessible, I used Perfy UI to do this.

I remembered what I did during the audit through a JS, a screenshot tool which runs accessibility tests for the entire application and reports any errors. I implemented this as part of the end-to-end automated testing, if there was an accessibility issue, the test would fail and notify us that there was a problem. It will take and capture a screenshot and write the message to file. Perfy uses a configuration file which I wrote so it knows which URL's to test.



7 - Continuous Integration

As well as Perfy I ran lint-staff-files after required to pass other continuous integration checks. These checks included Prettier, Stylelint, Markdownlint, Shellcheck, Hadolint and Markdown-Link-Check. Lint-staff-files runs Lint-staged on SCSS (.c.f.) files staged.

We use Cirrus to run continuous ci checks in one place, when I push code to our remote repository, Cirrus runs the code against various tests.

For example, Cirrus runs Lint-staged and runs any script which is not compatible, for instance, compile.bat, statement must be enhanced from all code. Ran automatically Yoyo and Cirrus. I used Yoyo for DB migrations. Yoyo is a CLI tool, I wrote a bash script to run yoyo apply to deploy all pending changes to prod.

Cirrus ping of Ofsted is also employed for our system to secure while working with potentially sensitive data. Ofsted is a government in London.

8.1 - Password Management

Password management is very high in priority since unique passwords, I decided to suggest a password manager to my team, after some research I settled on Bitwarden, an open source password manager that has very good reviews. Each account can be stored Bitwarden Bitwarden allows for password sharing between users, which is important for us as a team, password managers only need to remember a single password.

After testing it myself I recommended it to my team and they decided to start using as a company.