Blood-Hub APP Report

Blood donation centers locator web application

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INTRODUCTION

The aim of this project is to develop a blood donation center search app that connects blood donors with nearby donation centers, simplifying the process of donating blood. Developed with the target audience of the younger generation in mind, the app seeks to provide a more appealing and user-friendly alternative to the standard NHS websites. This will hopefully encourage regular blood donations and help address blood shortages. This report provides a comprehensive overview of the project, including its background, specifications, design, implementation, testing, and future improvements.

Fig1. Young Generation and Technology [1]

BACKGROUND

The availability of an adequate and safe blood supply is essential for medical treatments, emergencies, and surgeries. However, accessing blood donation centers and maintaining a steady supply of blood can be challenging. Donors often face difficulties in locating nearby centers and may lack awareness of the donation process. Donation centers, on the other hand, struggle to reach potential donors effectively. Blood-Hub App aims to bridge this gap by providing a convenient platform for donors to locate nearby centers and contribute to the healthcare system.

The primary focus of the app is to promote blood donation among the younger generation, who play a crucial role in maintaining a stable blood supply for medical emergencies and ongoing healthcare needs. Traditional methods, such as visiting NHS websites or making phone calls, may not always resonate with the younger demographic.

Therefore, the app offers a modern and engaging solution that is tailored to their preferences and usage patterns.

The key features of the app include a search functionality based on postcode, which enables users to quickly locate nearby blood donation centers.

SPECIFICATIONS AND DESIGN

Requirements

The app encompasses both technical and non-technical requirements to ensure its effectiveness, usability, and appeal to the younger generation. The following requirements have been identified:

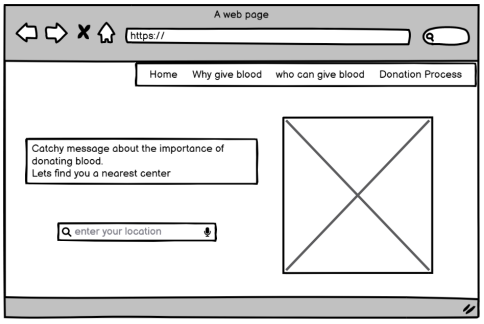
1. User-Friendly and Appealing Interface: The app should feature a modern and visually appealing user interface that resonates with the younger generation. This includes the use of vibrant colors, attractive typography, and visually appealing graphics and icons. The interface should be easy to navigate, ensuring a seamless user experience.
2. Postcode-Based Donation Center Search: The app should allow users to search for nearby blood donation centers using their postcode. This functionality enables users to easily find the closest centers and select the most convenient one for their donation, even whilst in new locations.
3. Display of Nearby Donations: Upon searching for a donation center, the app should display a list of nearby donation centers.
4. Eligibility Quiz: The quiz should cover factors such as age, weight, medical history, and recent travel to ensure that potential donors are aware of their eligibility status. Upon completion, users should receive clear feedback regarding their eligibility status, guiding them on whether they can donate blood at that moment.
5. Information Pages: The app should provide additional pages that users can navigate to for informative content related to blood donation. These pages can include sections on "Why Give Blood," "Who Can Give Blood," and "Donation Process." The information should be concise, easily digestible, and supplemented with engaging visuals.
6. Responsive Design and Performance: The app should be developed with a responsive design, ensuring that it adapts seamlessly to different screen sizes and devices. This allows users to access the app from various devices, such as smartphones and tablets, without compromising the user experience.

7. Minimalist layout:The app should employ a minimalist approach to ensure a clean and clutter-free interface. The layout should be carefully designed to emphasize important information and features, while minimizing distractions. Each paragraph within the app's content should be kept short and to the point.

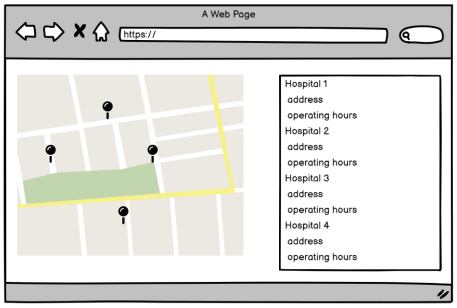
Design Layout

User enters the postcode on the first page and the second page is displaced with donation centers as shown in the wireframe below. Users can navigate using the navbar to other pages that give additional information like the donation process, why give blood, and who can give blood for users to find out if they are eligible to donate. An eligibility quiz was incorporated to engage the users and it's a quick way for them to determine their eligibility.

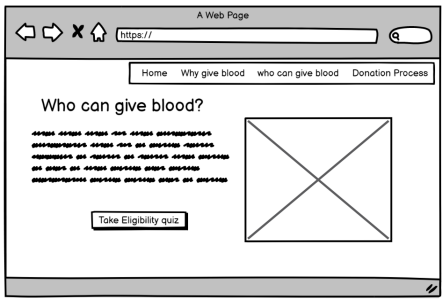
1. Postcode search



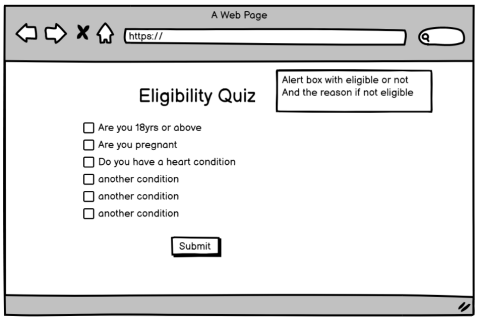
2. Donation centers locations



3. Explains eligibility factors

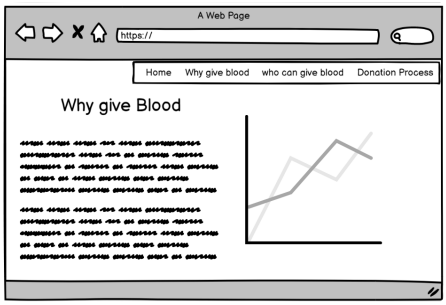


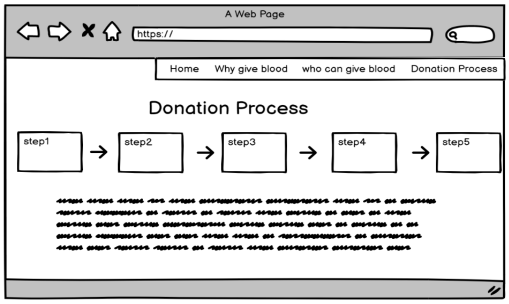
4. User can take a quiz



5. Information about the importance of donating blood

6. Outlines the donation process





IMPLEMENTATION AND EXECUTION

In the implementation phase, the team followed an iterative and agile approach to ensure efficient progress and adaptability to evolving requirements. Including having joint code troubleshooting sessions, to prioritize debugging quickly.

The team chose React.js as the primary framework for building the App. React.js offers a robust and efficient development environment, enabling the creation of interactive and responsive user interfaces. The team utilized various libraries and tools, such as React Router for navigation, Chart.js, Google Fonts, Font Awesome, Bootstrap, and Unsplash.

To enhance the app's functionality, a Google Maps API was integrated into the app. This API enabled users to search for nearby donation centers based on their current location. The integration allows real-time data retrieval, ensuring that users receive accurate and up-to-date information about donation centers in their vicinity.

Each member was assigned a component to work on at the beginning. Regular meetings and collaboration tools were utilized to facilitate communication and coordination. Each member had a branch on Github, pull requests were made and other members reviewed the components and changes before a merge was done into the main branch.

TESTING AND EVALUATION

Exception Handling was introduced into the Blood Donation Location page to ensure there were edge cases for user interaction with the API. Multiple avenues of testing were explored before settling on unit testing with Jest and react libraries. With all testing there is a trade off between speed and depth of testing. Whilst integrative testing offered a faster approach, the website’s design meant many components were dependent on each

other to function, so it was decided the more in-depth testing style of unit testing as we built, would save the development cycle time in the long run, especially across such a short project sprint, where unpicking errors in an integrative approach across multiple components could be costly. As there was no separate back end and front end, end to end testing was not utilized. Jest was chosen despite its age, as it remains one of the best testing libraries for testing Javascript, our main coding language, which we combined with `'@testing-library/react', testEnvironment: 'jsdom'` and other extensions to cover the breadth of styles and codes involved in our website.

Jest was used to focus on the user's experience of the website in 3 main forms: linking capability between pages, the text components being present in the page where expected, and carousels of images and videos moving as expected.

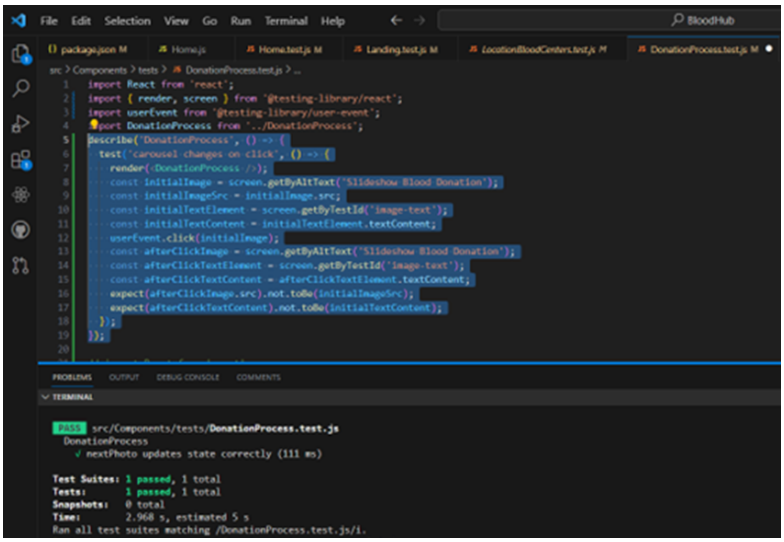


Fig. A. Carousel of images moving as expected has passed a jest test in DonationProcess.test.js

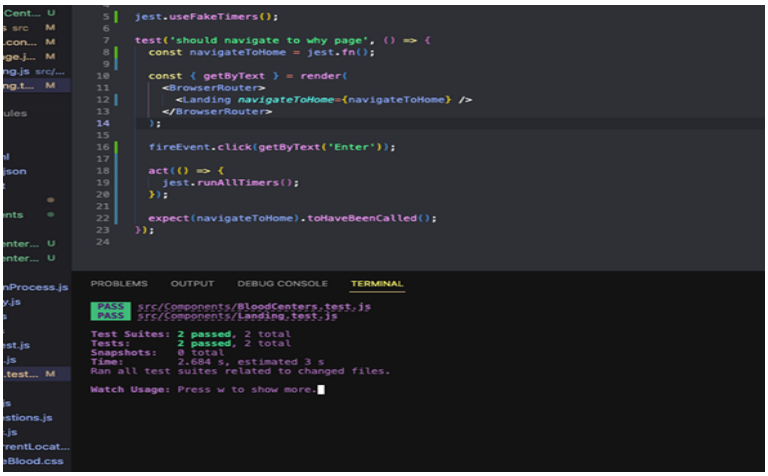


Fig. B. jest test passed for linking from one page to another (the home page)

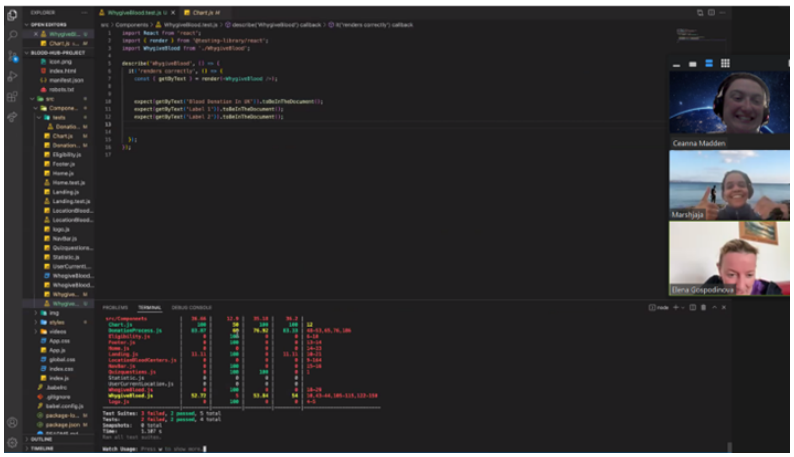


Fig. C. Using the command Test Coverage to track how much of our code the testing we wrote was covering.

Due to the strict time pressures of the project it was not possible to conduct widespread user testing. However, we did rule out the website on a beta trial to friends and family to get an ‘untrained eye’ and therefore a fresh perspective that would more closely align customer user interaction. We received the feedback that the font was too small on the Donation process page and the color of the text did not contrast with the images enough which may make legibility an issue for some people. This was valuable feedback that no automated or coder designed test could have given us, and something we had overlooked whilst worrying about matching styling colors with texts and CSS, which is why we were keen to make time for beta testing even in our tight deadline.

FUTURE IMPROVEMENTS

While the Blood-Hub App has been designed and developed to meet the current requirements and engage the younger generation effectively, there are always opportunities for future improvements to enhance the app's functionality, user experience, and overall impact. Here are some potential areas for future enhancements:

1. Integration with Social Media: Enable users to share donation experiences and milestones on social media platforms, fostering community and awareness.
2. Gamification Elements: Introduce badges, achievements, and leaderboards to encourage regular donations and create healthy competition.
3. Real-Time Appointment Scheduling: Incorporate a real-time appointment system for users to book convenient donation slots.
4. Enhanced Location Services: Integrate more databases of blood donation centers to provide users with precise and up-to-date information about nearby donation centers, like operating hours, and contact details.

CONCLUSION

In conclusion, the Blood-Hub App is a significant initiative designed to simplify the process of finding and donating blood. By leveraging the power of React.js and Google Maps APIs, the app provides a user-friendly platform for connecting blood donors with nearby donation centers. The focus on the younger generation as the target audience ensures that the app is appealing, engaging, and aligned with their preferences.

The Blood-Hub App represents a step forward in improving accessibility, transparency, and efficiency within the blood donation ecosystem. By empowering donors, and educating the younger generation, the app has the potential to make a significant contribution to the healthcare system and save countless lives through regular blood donations.As technology continues to evolve, the Blood-Hub App can serve as a model for leveraging mobile applications and innovative solutions to address critical healthcare challenges.