Scrabble App (Zebra Word Judge) Proposal

12.08.2022

Group 16 (TF1) Members:

Scrum Master: Tom Leggett Lane

Scrum Team: Ajay Basra, Alexander Hithersay, Matthew Lee, Romulo Buenafe

Table of Contents

Executive Summary

Scrabble has been experiencing a surge of popularity lately, with there even being a New Zealand Scrabble Players Association (NZASP). Every year, legions of people are brought together in tournaments and events to have fun playing the game they love.

One of the most important aspects of Scrabble is the actual validation of the words played; currently, there only exists a single Android app to judge the validity of played words. As such, tournaments don't have the luxury of being able to use any device they want, and in scenarios where there is no Android device available, they must resort to manually checking a Lexicon. This can potentially make games longer than they need to be. We can tackle this issue by making the app available on more platforms, making the functionality of the app accessible to a larger audience. This can be achieved by using modern frameworks which allow us to create cross-platform apps.

In order to bypass this current limitation, we are proposing to release a word validation app on the web, Windows and IOS platforms. This app will be based on the pre-existing Android 'Zebra Word Judge' app to ensure uniformity across platforms. Our app will extend the 'Zebra Word Judge' app providing more features whilst meeting the constraint of needing to be usable offline. To implement these apps within the limited timeframe, we will be utilising ReactNative as it gives us the ability to use a single codebase across multiple platforms. This will also mean that in the future, we'll be able to roll out updates and bug fixes for all the apps simultaneously.

We are a motivated group of final-year Computer Science majors with skills and knowledge accumulated over the last few years from both university and self-learning. We've all taken practical programming classes which cover building full-stack applications whilst conforming to the agile methodology. Even though most of us aren't proficient with ReactNative, we've all been exposed to JavaScript in one way or another, and so we believe that we won't have trouble learning the framework. We have created a project timeline on Jira to have a rough overview of how our project should be moving along. Furthermore, we've set up a discord server and divided roles for easy communication and efficient workflow. To learn ReactNative, we have purchased Udemy courses and collated other valuable resources such as YouTube playlists.

Background & Rationale

Currently, the New Zealand Scrabble Players Association (NZASP) only has access to a single word validity checker app, which is only through Android devices. For tournaments and events, NZASP is unable to use other platforms such as Windows and IOS. As a result, the app's functionality is inaccessible for many as people use a wide variety of operating systems. The biggest shortcoming which stems from this is that in tournaments where there are no Android devices present, words have to be manually judged, which can take considerably longer - causing delays.

Whilst the pre-existing Android app is a good baseline, it's missing some essential components such as accessibility features for disabled users and a history of previously challenged words. Additionally, minor visual improvements can be made to improve the overall look.

Having the app available on only one platform is simply not enough, and our client Dylan Early instructed us that there is high demand for the app to be released on more platforms as soon as possible. In fact, the app is intended to go global as the newly formed WordGamers International anticipates using the app for all Scrabble games played around the globe. Dylan also mentioned that a while back, he tried hiring a contractor to build out an IOS version of the 'Zebra Word Judge' app however, the deliverable was of poor quality and failed to meet many of the requirements; in fact, it doesn't even function properly but still lives in the App Store.

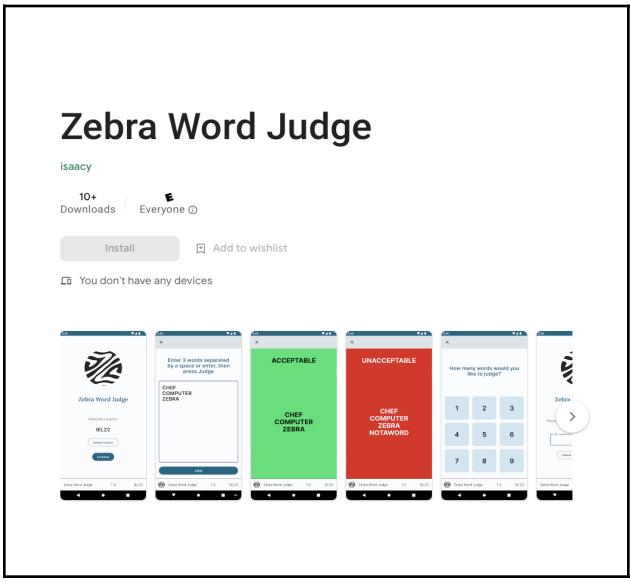


Figure 1. Pre-existing Android App

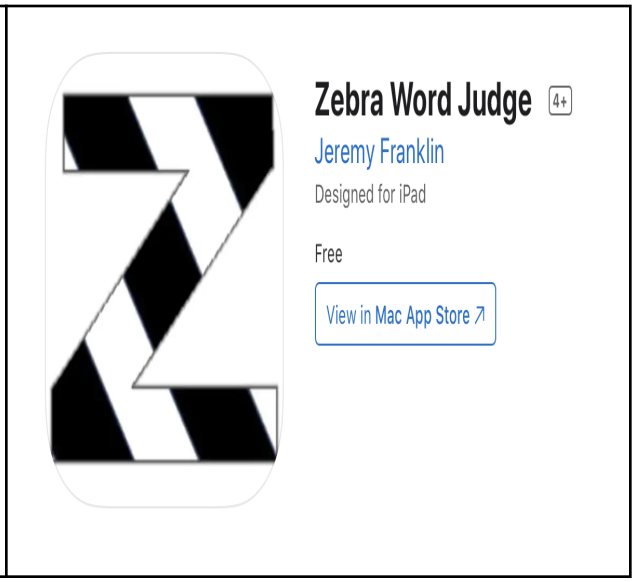


Figure 2. Failed IOS App

The goal of our project is to address all of the shortcomings mentioned above so that our client is satisfied. We aim to release ‘Zebra Word Judge’ on the web, Windows and iOS so that a much larger demographic will have access. By making the app easier to access, hopefully, there will be a domino effect. Hypothetically more people will be able to play Scrabble, subsequently increasing attendance at tournaments and events organised by NZASP. But the benefits of releasing the app on multiple platforms aren’t limited to the context of NZASP, as even casual players will be able to play Scrabble games anywhere with the ability to validate the words they play, making it a more competitive and enjoyable experience.

Another big goal of this project is to implement accessibility features so those with disabilities can also utilise the app. Dylan, our client, remarked that there was a very skilled local Kiwi player who didn’t let their disability stop them, and despite the challenges, they are very highly ranked. Whilst creating our app, we will take into consideration how we can make our app accessible for the visually impaired through features such as voice assistance and text-to-speech so that all users can have the same experience. Something which is lacking in the pre-existing Android app.

This project is both highly-rewarding and worth pursuing as we are solving a real-world problem with potential global impact. The project will be a precious resource for the NZASP and will make it extremely easy to judge the validity of played words regardless of your device. Players will surely enjoy this app as they will not have to worry about the word judging aspect of Scrabble.

Specific Aims

Web App - Prototype *(Week 5 - Week 6)*

Have a working web app prototype completed that allows users to check the validity of up to eight words. UI/UX and accessibility are not priorities at this stage.

Web App - UI / UX / Accessibility *(Mid-Semester Break)*

Refine and finalise the web apps' user interface, accessibility controls, and overall user experience. By the end of this sprint, the MVP web application will be completely finished.

Web App - Usage Testing *(Week 7)*

Write a questionnaire and perform usage testing on the Web Application. Testing will be performed by our client, a group of competitive scrabble players selected by the client, and each team member.

iOS / Desktop - Prototype *(Week 7 - Week 9)*

Extend the web app application to iOS and Desktop using React Native. These applications must be able to work offline.

Desktop & iOS - UI / UX / Accessibility *(Week 9 - Week 10)*

Refine and finalise the iOS and Desktop apps' user interface, accessibility controls, and overall user experience. It is required that the iOS app has full-blindness accessibility features, such as screen readers and speech-to-text capabilities.

Desktop - Installation Process *(Week 9 - Week 10)*

The desktop application must have an easy installation process on Windows 10. This task is to make the installation process as simple as possible for users, without needing to disable any antivirus software.

All Platforms - Usage Testing *(Week 10 - Week 11)*

Complete thorough usage testing and bug fixing on all platforms.

Project Approach

React Native is the main technology we will be using for our IOS app and Windows app. React Native is a javascript framework that uses native APIs to render code across multi-platform. For the web version, we will use the React.js library along with HTML and CSS. Node.js is our backend runtime environment on all platforms. The Jira application will be utilised for planning and documenting sprints. The Jira roadmap uses a Gantt chart which allows us to see our main tasks and work allocation; each main task is broken up into sub-tasks. We will also be using git for workflow integration which we are all familiar with using. Finally, Visual Studio Code will be our text editor of choice for all platforms.

We will be using the agile project management philosophy, specifically an altered scrum methodology implementation of agile. This involves breaking down goals into timed iterations called sprints, which will be biweekly. We will be holding at least two meetings a week on Tuesday and Friday to assess sprint progress, plan the next sprint, and for reflection and improvement. However, we may hold more than two meetings if unexpected complex problems arise. Every two weeks, there is a meeting with the stakeholder to get feedback on our work. We have chosen this altered version of scrum because it is more beneficial than ‘True Scrum’ for shorter development timelines like our own. This management methodology was specifically created to help us increase our team synergy through reflection on strengths and weaknesses, and planning each sprint accordingly.

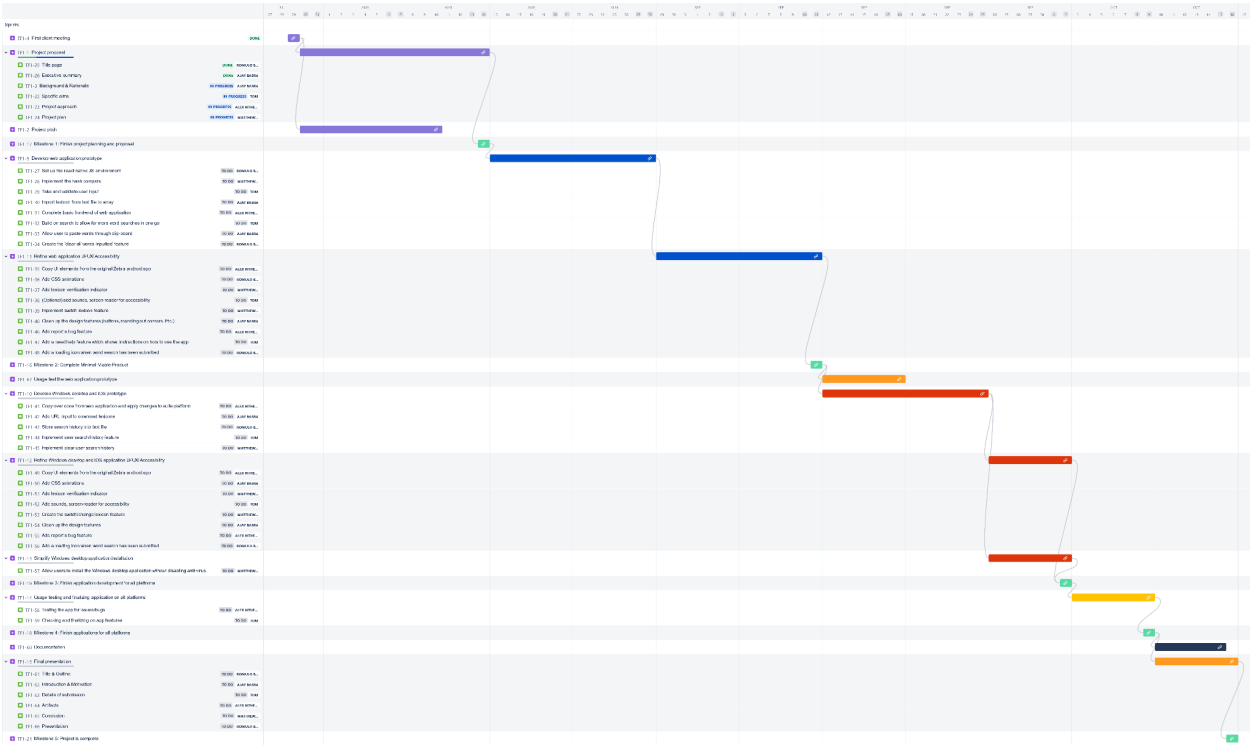
Name	Roles
Ajay	Full-stack developer, Team leader
Alex	Full-stack developer, Quality assurance
Tom	Full-stack developer, Quality assurance
Ryan	Full-stack developer, Quality assurance
Matthew	Full-stack developer, Quality assurance

A challenge that we will likely face in completing the project is the use of new technology such as React Native and React.js. None of us have used these technologies before and we will be learning as we develop. In an attempt to mitigate this risk, we have purchased Udemy courses and have found various other resources that teach the technologies and will be referring to them as we develop the app. Another challenge we face is difficulty estimating sprint time. Because we will be learning a new framework as we develop, problems may arise that were unexpected, and these problems may delay features being implemented in the estimated time. To mitigate this

risk, we will break large tasks into smaller tasks to make them more manageable. In addition, if a complex problem arises that may delay an iteration of work, the team will converge and work on a solution together to mitigate this delay. Since we are using a form of scrum for project management, we will have the ability to adjust our priorities and planned work as we go to ensure we use our time as efficiently as possible.

The deliverables of our project will be fully functional IOS, Windows, and web app versions of the Zebra Word Judge app and related documentation by the 9th of October. All of the versions should have the full functionality of the current android Zebra Word Judge, as well as additional features, including accessibility for disabled scrabble players and improved UI/UX. We will conduct thorough usage testing to ensure that the final products are bug-free.

Project Plan



Legend - **Green:** Milestones, **Purple:** Planning tasks, **Blue:** Web application tasks, **Red:** Desktop & iOS application tasks, **Yellow:** Testing and finalising tasks, **Dark Blue:** Documentation, **Orange:** Final Presentation, **Lines between tasks:** Prerequisites between tasks.

Week 1 to Week 4

From weeks 1 to 4, we began the process of starting the project by forming our team and selecting a project that our team would be interested in undertaking. After receiving word of which project we had been given, we had our first client meeting, where we met

with the client to discuss the project requirements and specifications in further detail. From this meeting, we were able to understand the exact requirements the client wanted and expected from the outcome of this project. Once we learnt the specifics of the project, we began the planning and brainstorming phase of the project. By the end of week 4, the first milestone regarding finishing all the planning of the project should be completed.

Week 5 & Week 6

Weeks 5 and 6 are where we will begin in developing the foundation and functionality of the Scrabble web application. The framework we have chosen to use for the web application will be React Javascript. As our project consists of a Scrabble application that will be released on multiple platforms (Web application, Windows 10 desktop, and iOS), we have set a period of two weeks to develop a functioning web application prototype that allows a user to check the validity of up to 8 words in one search.

Mid-semester break

During the 2 week period of the mid-semester break, we will continue the development of the web application by refining the web application's user interface, the accessibility of the web application, as well as the overall user experience. We expect that the two weeks should be enough time to fully refine all these features. By the end of the mid-semester break, it is expected for us to have reached our next milestone, which is the minimum viable product of a working Scrabble web application that includes the required features set by our client.

Week 7 & week 8

In weeks 7 and 8, we will begin the development of the Windows 10 desktop Scrabble application, as well as the iOS version of the Scrabble application. The framework we will use for the two platforms is React Native. We have allocated two weeks to create a working prototype for the Windows 10 desktop application and the iOS application. The reason why we feel two weeks is an appropriate amount of time to make two prototypes is that it will not take as long to develop compared to the web application since we can reuse the code template from the web application to suit the desktop and iOS applications with some altering. We will also perform usage testing of the web application in week 7.

Week 9

By week 9, we expect to have finished a working prototype of the Windows 10 desktop Scrabble application and an iOS Scrabble application. From there, we will spend this week developing the user interface, the user experience, and the accessibility of both applications. Within the week, we will also be looking at simplifying the installation

process of the Windows 10 desktop application in a way that would allow a user to easily install the application without having to worry about disabling the system's anti-virus for the application to work. Overall, the installation process will be simplified to allow a user with minimal technical knowledge, to be still able to install and run the Scrabble application.

Week 10

Since we have planned by the end of week 9 to have finished our Scrabble applications for the web, Windows 10 desktop, and iOS; we will be using week 10 to perform usage testing on all the applications and to fix any bugs or issues that we come across when testing the applications on each platform. Week 10 will be treated as the final week for polishing and refining our developed applications before we officially release the Zebra word judge applications. By the end of the week, the Zebra word judge web application, Windows desktop application, and the iOS application shall all be finalised and ready to be released.

Week 11

Week 11 is where we will be writing up the documentation of the project as a whole. It will consist of details that explain our group's: progress, issues, meeting deadlines, roles, Etc, all throughout the span of the whole project. We will also create a final presentation which will be presented to the client and an audience in week 11, showcasing the final outcome of our project.

Table of Authorship

Section	Author(s)	Signature(s)
Title Page	Romulo	
Executive Summary	Ajay Basra	
Background & Rationale	Ajay Basra	
Specific Aims	Tom Leggett Lane	
Project Approach	Alex Hithersay	
Project Plan	Matthew Lee / Romulo