WordScuffle

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Background

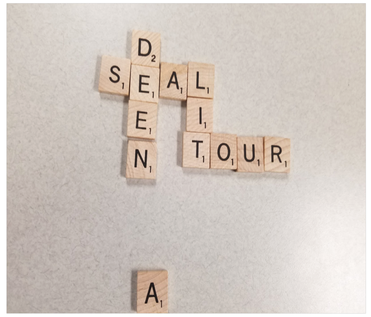
Our sponsor, Barbara Jenkins, created WordScuffle and has been playing a pen and paper version of the game for over a year.

The game is played by arranging letter tiles in a grid to create words.

- Tilesets are generated by rolling dice and emailing everyone the tilesets art the start of the day.
- Each user gets the same tileset challenges for the day.
- Challenges have a specified time to use all their tiles to create connected words.
- Time keeping and scoring is done by the user while they play. This method is error-prone and relies on the honor system.
- Players email their scores to each other at the end of the day.

Alzheimer's Disease is a progressive form of dementia which gradually destroys mental function and memory. As of 2015, there were an estimated 29.8 million people suffering worldwide from it, and it is the sixth leading cause of death in the U.S.

By creating a fast-paced, addictive word game with a social aspect, we've provided users with an environment that may reduce the chance of developing Alzheimer's disease.



Original version of WordScuffle

Solution Overview

Our team has brought WordScuffle to the web 2.0 platform.

What our solution aims to fix:

- Automated scoring to allow players to focus on word combinations.
- Implement an ability for users to view friends' scores.
- Improve social aspects by controlling tileset generations and high-score viewing.
- Provide word validation to lower confusion and eliminate scoring mistakes.

Our web application consists of three main components:

- Our Javascript frontend client runs in a web browser. We used Dragula and Angular Javascript extensions to create a clean user interface and to implement the ability to drag and drop letter tiles in the game.
- A Node.js server communicates with the frontend client to validate the play grid, display scores and generate the daily tilesets.
- For security, we are using Firebase for our database and user authentication. Our server can upload and download challenge scores to pass to the client.

Challenges

Word Validation
No free word validation options available.
We tried the best choice available that had a 5,000 word validation limit per day, but quickly exhausted that limit.
Solution: We created a data structure on our server that could quickly validate any word.

Tile drag and drop
Dragula technology has the ability to dynamically size the containers. After designing a streamlined and dynamic tile grid interface, we found the service would not work for our design.
Solution: Use a separate Dragula container for each square on a statically sized tile playgrid.

Testing

Unit Testing
We used tools (Karma) included with the Angular framework to perform unit testing on individual Angular components within our app.

Integration Testing
In this step we verified that our Angular components maintain data concurrency with our backend via Angular services.

Usability Testing
Our project sponsor and a body of 10-20 additional players have been testing our app throughout development.

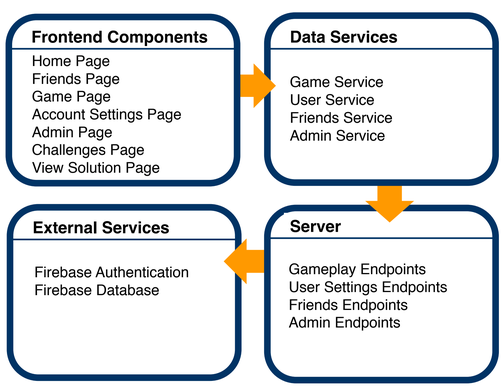
Impact

We have created a web based game that challenges users to create connected words on a grid using a given set of letters. Users can add friends and compare their friends' scores for competed challengers. The stimulating game coupled with the social aspect will help prevent the onset of Alzheimer's Disease.

Future

The ability to demo the game without the user's score being saved gives the user reason to make an account if they enjoy the game. This allows some form of monetization to be easily added to the game, either in the form of a one-time fee to create an account, or a monthly subscription fee.

Architecture



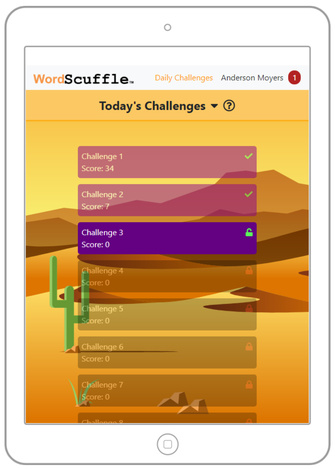
Architecture components split into four categories

Technologies

Angular

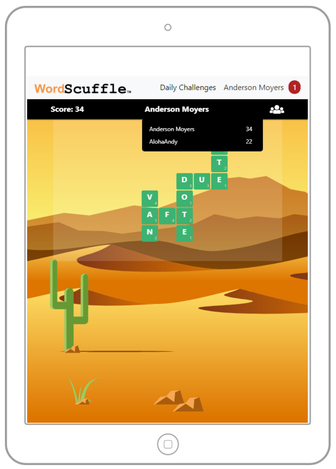
Firebase Database
And Authentication

Outcome



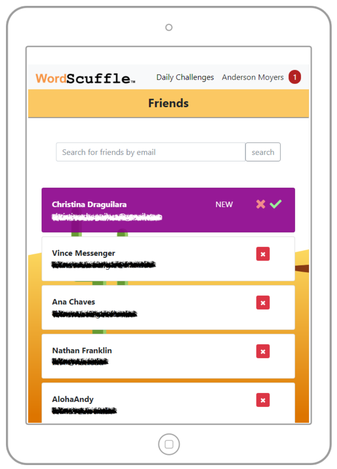
Challenges Webpage:
Challenge 1 has been completed.

Challenge 2 is available to play.



Viewing Challenge 1 score:
Dropdown menu allows viewing friends' scores.

Playgrid and tile tray populated with submitted board.



Friends Webpage:
Friend requests can be submitted by entering friends' emails.

Accepted friends and friend requests displayed on webpage.