Software Engineering Large Practical Proposal

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1 Overview

Grabble is an Android application that allows users to collect letters from around Edinburgh central area and construct words with them.

The user has to physically walk around the city and collect the letters marked in the game map. The game play should not be complicated, but there are certain rules regarding how users can create new words.

The most important component of the application is the map, from where users can also access other pages such us their inventory of letters, user details and instructions.

2 Requirements

2.1 Functional requirements

1. Application components

   - When launching the application, user is presented with a welcome screen and a start button.
   - The start button takes the user to the **Campus Map** screen.
   - The map screen has a **More** icon from where user can access **Letter Inventory**, **User details**, and **Instructions**.
   - User can return to campus map from any of the other pages.

2. Campus Map

   - User starts game with map centered around current position and can not zoom our or scroll to other locations.
   - If current location can not be detected, user is placed at last known location.
   - If GPS is inactive, user is prompted to activate it so application can track his positionand update map accordingly.
   - If there is no network connection, application displays prompt to activate it, because it needs a connection in order t populate the map.
   - When user changes position, location is updated and map camera changes focus.
   - Letters are placed at different positions on the map, depending on the day of the week when the user launched the application.
   - User requires Internet in order to load the letter map.
   - User can see letters than are placed around his current position.
   - User can click on a nearby letter and pick it up.

- Picked up letters disappear from the map and are saved in user's Letter Inventory.

3. Letter Inventory

    - Letter Inventory contains all the letters that the user has in possession, excluding already used ones.
    - From Letter Inventory, user can select **Create new word**

4. Create new word

    - User can select 7 letters and press create new word.
    - Application will check that the word is valid.
    - A valid word is 7 letters long and contained in the Official Grabble Dictionary, which users can not access.
    - If the word is invalid, user will be displayed a reason (either it is not a word or does not have enough letter)
    - If the word is valid, user will be displayed its score. All used letters will disappear from inventory and score will be added to user's total score.

5. User details

    - User has a default name and a total score of 0 initially.
    - User can update the name and avatar.
    - User can see total score, which is the sum of all words scores.

6. Instructions

    - User can access game play instructions.

2.2   Non-functional requirements

- Application will be compiled using API 22, mainly because it is supported by Android 5, which means it simplifies initial testing on developer's phone. Starting with API 23, users need to grant permission at runtime, which allows them to choose the parts of the applications to which they want to grant permissions. However, our game requires network and GPS connection at all times, since the map is the main component. Therefore, requesting all permissions once in the manifest will suffice.

- Map screen should take no longer than 10 seconds to load.

- Letter inventory should be updated immediately with new picked up letters.

- GPS should have high accuracy.

- Users should not lose saved data unexpectedly.

- Game should not require more than 100 MB of storage.

- Application should display meaningful error messages.

- User interface should be intuitive and user friendly.

- Application should not consume resources when user is not using it. (no need to track location when application is paused)

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2.3 Bonus features

Time permitting, there will be additional features to enhance user experience:

- User can access their word history, a list of all the words they created and achieved scores for each.

- A list of challenges that user can complete for extra points. Example challenges: words containing the same letter 3 times, collecting more than 50 letters over time.

- User can choose an avatar picture that will be displayed on the map as the move.

- Sounds play when letters are collected.

2.4 Notes

- A decision has been made to disable scrolling and zooming out the map, so user can only see the letters closed to their position. However, this decision should be further investigated, as it can prove rather annoying to user.