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The Hydrate Mobile Application

1. Introduction

The Hydrate application has been created as an assignment for Edinburgh Napier University. The main learning outcomes of this assignment consist of developing, designing, testing and finally demonstrating a working prototype of a mobile application with attention to user needs and expectations in the current market.

Hydrate is a simple application meant to help the user track the amount of water they drink during the day. There are several similar applications in the Google Play store as well as Apple's App Store. Most of these applications implement useful features, such as a loading bar representing the water that has been drunk so far, charts, recommended targets etc.

The goal however is to create an application that is easy to navigate in and yet provide consistent, precise data on the user's drinking habits. Therefore, an attempt to create an intuitive UI that is easy to understand will be made. The original features that are planned to be implemented are:

- Main activity where water can be added
- Bar that shows how much water has been drunk
- Calculator for estimating targets
- Achievements
- Settings to customise measures panel

The main inspirations for the application were the two leading applications (on the topic) on the Play Store. These are 'Water Drink Reminder' and "Aqualert". The evaluation process and further prototyping will mostly be based on how to make the Hydrate app a worthy rival for the market.

2. Software design

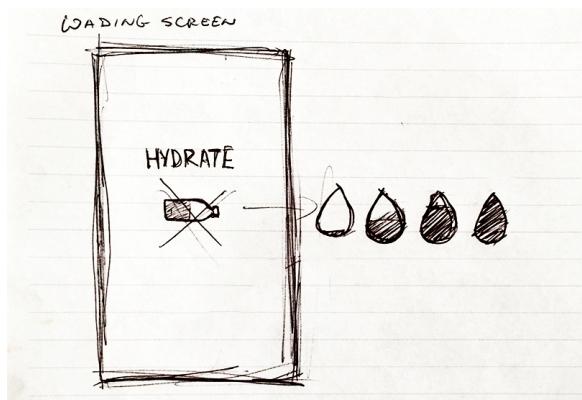


Figure 1a

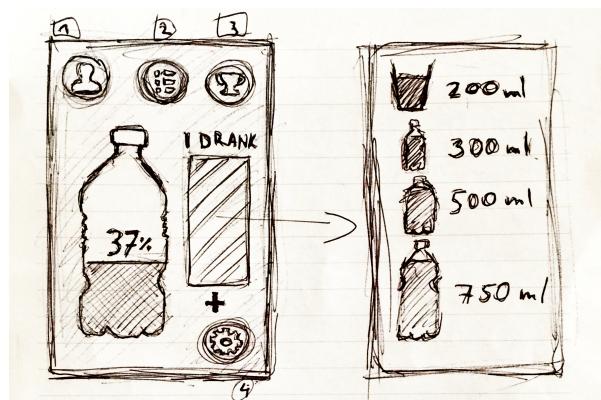


Figure 1b

As can be seen on figures above, the initial concept for the application is very similar to the final prototype. As the concepts were created before studying the Design Patterns and Android Developers guides, there are several elements that have been changed. For instance, the top buttons (figure 1b) have been replaced and positioned on a toolbar. This way, implementation across the application was also easier as there are existing libraries for the toolbar and the overall interface should be more familiar for android users.

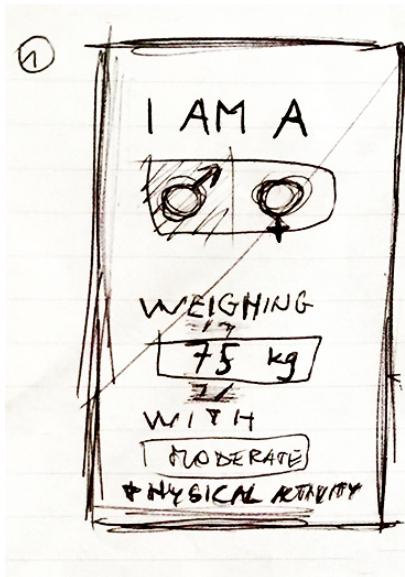


Figure 1c

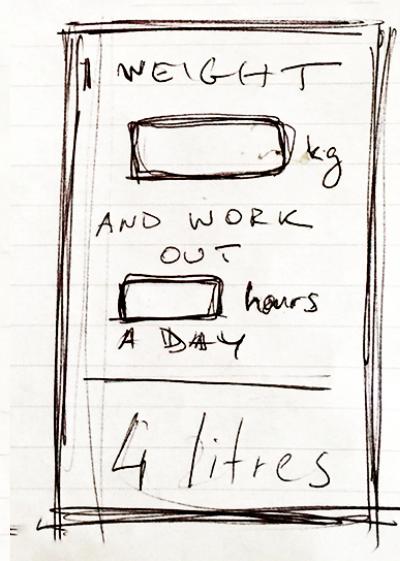


Figure 1d



Figure 1e

There have been several design considerations that took place in the initial sketching. The User Details activity needed to not only be very straightforward, but also made in a way that requires the user to only provide information that is crucial for the app. Therefore, the user is not asked to provide any other details than weight and daily activity. Feedback is also given to the user, letting them know how much water needs to be drunk. Many other applications do not have this feature, only a default target that is the same for everyone.

The settings screen (figure 1e) has gone through a lot of changes as well. Mainly the icons have been simplified to a single drop. This drop icon can be seen throughout all the activities.

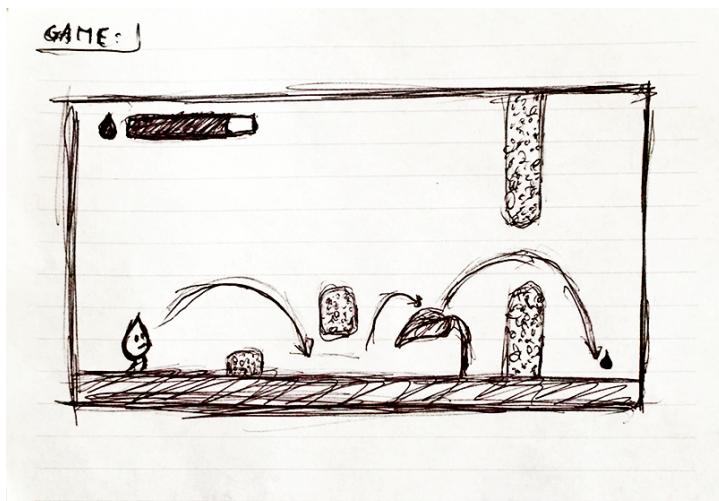


Figure 1d

A game concept for the application has been considered as well. The user would be rewarded with the possibility of playing a game once they reach their daily targets.

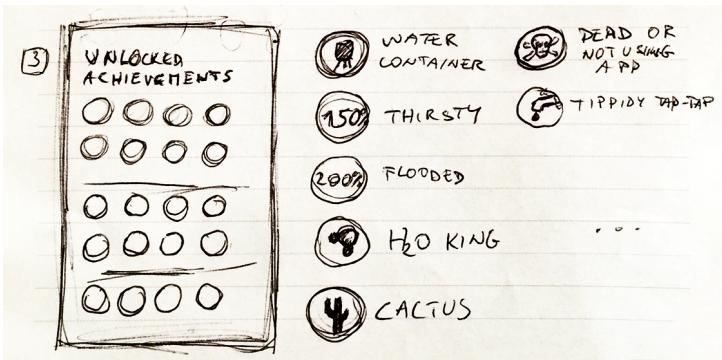


Figure 1e

Much like gamification (figure 1d), achievements/badges would help the user reach targets by receiving rewards.

3. Implementation

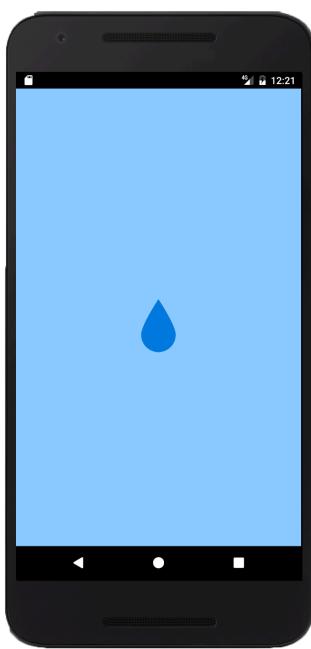


Figure 2a

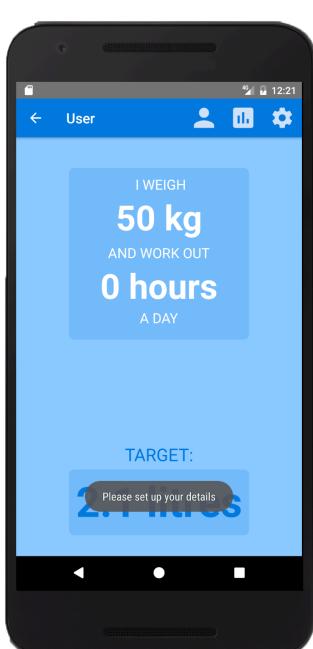


Figure 2b



Figure 3a

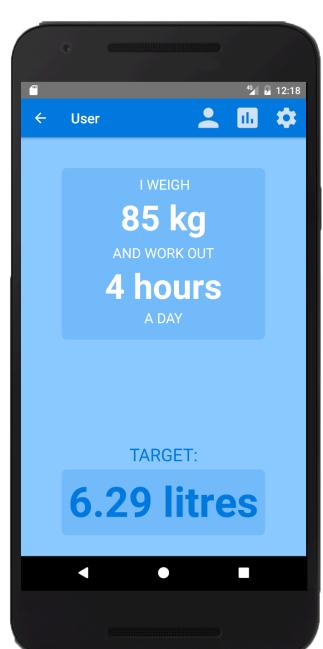


Figure 3b

When opening the application, we are welcomed with a subtle splash screen (see Figure 2a) that is only shown for the time it takes for the phone to configure the application. This has been implemented according to Google's guidelines (Stewart, 2015), therefore the length of this splash screen depends on the phone it's being run on.

In case this is the first time the application is run, we are automatically directed to the User Details activity (Figure 2b), where we are prompted to set up personal details – weight and daily activity. This data is saved to the phone's storage and is used to calculate the daily target of water that should be drunk. The process of set-up is shown in Figures 3a and 3b.

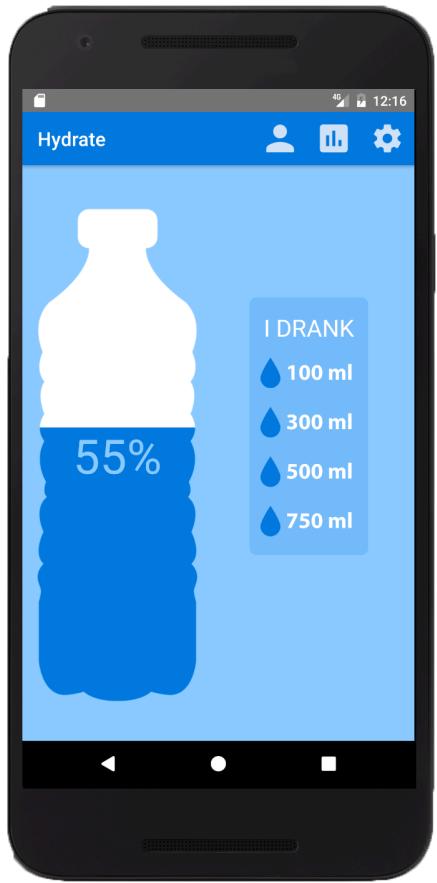


Figure 4a

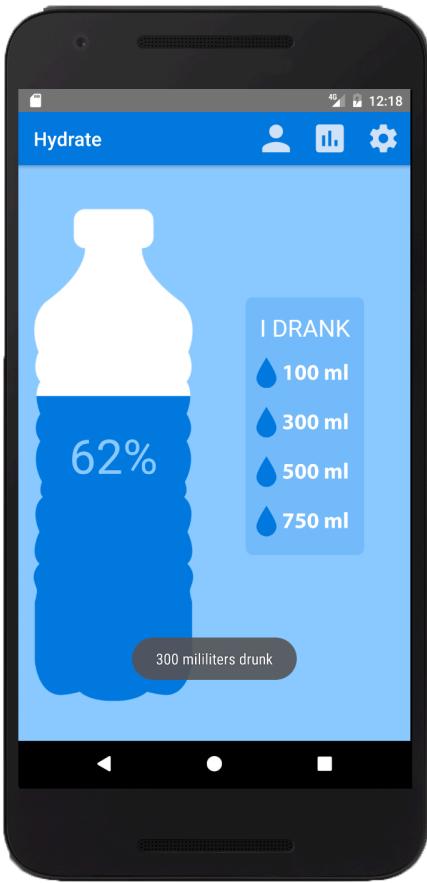


Figure 4b

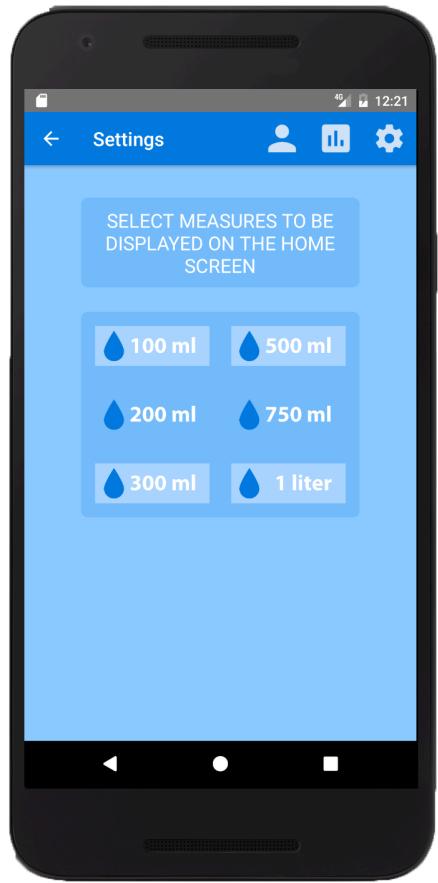


Figure 4c

If it is not the first time running the application on the device, we are always greeted with the Main Activity showing a big bottle (figure 4a). This bottle is used as a loading bar, showing how much water the user's already drunk that day. This has been implemented as a white rectangle, covered with a silhouette that matches the background colour. In between these two objects, a blue rectangle is drawn on a canvas, which changes size based on the returned drinking target / water already drunk ratio.

The right side of the main activity is reserved for measure buttons. Clicking one of these “adds water to the bottle”, and refreshes the view of the bottle. For higher perceived responsiveness, it also generates a Toast confirming the amount of water that has been drunk (figure 4b).

Tapping the settings button in the upper right corner opens the Settings activity (figure 4c), where the user can customize their measures from the Main Activity, so they can choose the measures they use most often. These settings are saved through SharedPreferences.

A lot of credit needs to be given to Bucky Roberts' You-tube channel, thenewboston, as a lot of obstacles during the implementation were overcome thanks to his online tutorials. With more concrete errors and non-compiling code, the community of stack-overflow has been very helpful.

For checking the history of drinking, it was originally planned to create an Achievements activity, where the user is presented with the badges they have earned. However, this would not be a precise way of checking one's history. Instead, the Charts activity has been implemented. This activity currently displays two graphs – one showing results from the past week, and the other one for two weeks.

The graphs are viewed using an implemented external library – GraphView (Gehring, 2017). GraphView can be implemented by adding

```
compile 'com.jjoe64:graphview:4.2.1'
```

to the **build.gradle** file under the app directory into the dependencies block.

The two graph views draw from a database using SQLite, which stores a date String and a percentage value for every day when the application has been run.

For demonstration purposes, the current version of the application generates a database for the days between the start of the month and the current day. This database is only generated on the first launch and stays in the phone's storage. Afterwards, every day a new entry is created using actual user data.



Figure 5

4. Evaluation of implementation

4.1 Comparison against original concept

The final prototype is a fully functional application with most of the planned features already implemented. There is however quite a lot of space for improvement.

Firstly, as compared to the original concept, the app lacks the Achievements activity. This is due to the fact it has been replaced by the Charts activity for better tracking. Implementing both features could result in an even more enjoyable user experience. None of the gamification concepts were implemented either. These, however, weren't planned to be included in the current prototype, therefore they may appear in future versions.

Several features that weren't considered during the initial designing process have been implemented. These include toasts for enhanced feedback, charts, dialogs etc.

4.2 Comparison against other applications

When comparing the application to 'Water Drink Reminder' and "Aqualert", it is clear that Hydrate will need to implement a notification service, to remind the user to drink water whenever they're behind. This would be superior to the other two applications, as they only send notifications every number of hours regardless of how much the user drinks.

Also, both applications have custom icons for each measure. This was covered in the initial design for Hydrate as well. However, the icons did not fit the UI, therefore they were replaced with the app's drop icon. Future versions should focus on enhancing the design as well;

4.3 User observation

An ethnographic approach has been chosen to evaluate the application. Three potential users have been shown the app with a brief explanation of what it's for. They have been asked to navigate through the app, comment what they're thinking, what their expectations are and what doesn't feel right about the interface.

The outcome of these observations was rather unanimous. They all agreed on three points:

- The main activity seems too 'empty'
- Notifications are missing

Surprisingly, all of the participants instantly recognised the purpose of the blue bar in the charts (the target line).

5. Summary

The final prototype of the application is very similar to the original concept with only a few features not implemented. Some of the implemented features have not been originally planned, regardless there is still a lot of space for improvement. In order for the application to become a successful rival in the Play Store, there are still many features to be implemented including notifications, gamification, enhanced UI.

All image resources used for the application were created by me, or have already been included in the Android Studio package. For sound effect resources see reference list below. An external library(GraphView) has been used for the graphs in the application.

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