Project Plan

Master Practicum "Android OS", WS 2012/13

Zaur Molotnikov, Bibek Shretsha
zaur.molotnikov/bibek.shretsha@in.tum.de

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Abstract

This document is a rough project plan, a part of the Android OS Master Practicum, MSc Informatics program at TUM. In the document we describe the idea of an upgrade for the AnkiDroid software, which lie in the basis of the project as well as try to come up with time estimations on each of the parts. We shortly discuss, why we think the ideas are challenging and important, together with criteria or goals we put on the resulting work. We mention here the desired process model, we are going to take in order to reach the goals.

Contents

1 Introduction

AnkiDroid is an Android user interface (UI) for the bigger Anki project. The project contains desktop cross-platform application, web-application and services, as well as mobile client or UI.

The whole goal of the Anki software is enabling the user to learn new information, by memorizing cards. The software, however is different from many memory-cards applications in some ways. First, it has an algorithm to track, how well the user is remembering the information, advising on which cards has to be repeated on a particular date.

The cards have usually two sides, and thus represent an entity in the data base with two most-meaningful fields. The user composes sets of the cards, which are called decks. And then has chance to review the composed decks. The program allows manipulation with decks, such as: generating new cards from existing ones (for example, through reverting), sharing decks on the web server, exchanging decks with other Anki users, synchronizing decks (and the usage info) among different Anki clients a single user may run.

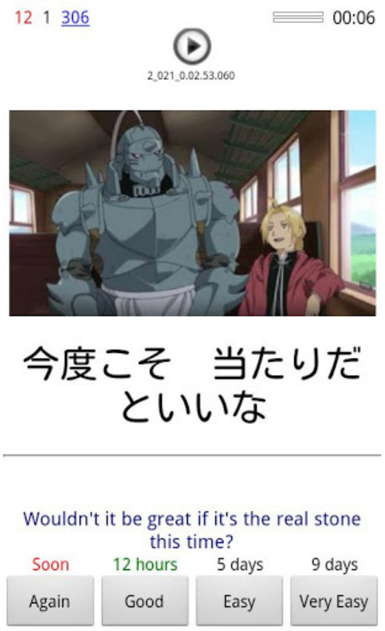
Potential usages for the learning application with cards could be, Anki (b):

1. learning a language
2. studying for medical and law exams
3. memorizing people's names and faces
4. brushing up on geography
5. mastering long poems
6. practicing guitar chords

plus, what we identified is could also be possible:

1. learning pronunciation
2. learning music types
3. learning chemistry formulas
4. teaching children
5. developing visual memory

However, the full capability of all learning techniques can only be achieved by a powerful enough cards application, which would support different sorts of content on the cards. For example, to study formulas (either in chemistry, or mathematics) the graphical content would be much more appropriate,



今度こそ　当たりだといいな

Wouldn't it be great if it's the real stone this time?

Figure 1: AnkiDroid Screenshot : Imported from PC version graphics, is not possible to input in AnkiDroid

than textual. To memorize people's names and faces, as the project creator suggest, also photos are essential. Learning a foreign language put other demands on the application: it has to support pronunciation of complicated words, (like "Wiedervereinigung", German for reuniting, or "Dostoprimechatelnosti", Russian for sights), as well as different fonts, to show Arabic spelling or hieroglyphs.

Displaying of such content is a must for the application. However, on a modern mobile device, the creation of such content could be especially productive, due to high interactivity level with the user. One could imagine recording voice from the microphone, capturing photos on the camera, or drawing illustrations with the sensor screen capabilities.

Unfortunately, such mentioned features are currently missing from the Android implementation of Anki, but are required by community, and are constantly asked for Anki (a)

The existing implementation of AnkiDroid contains only raw textual input. Simply adding a better WYSIWYG editor for the text to have styles there, would be a great improvement. However this is not the main target for us.

Often while learning something the user starts from something he/she does not know. This causes a need to search for knowledge. In a context of the Android application for cards, it would mean many steps process to finish one cards:

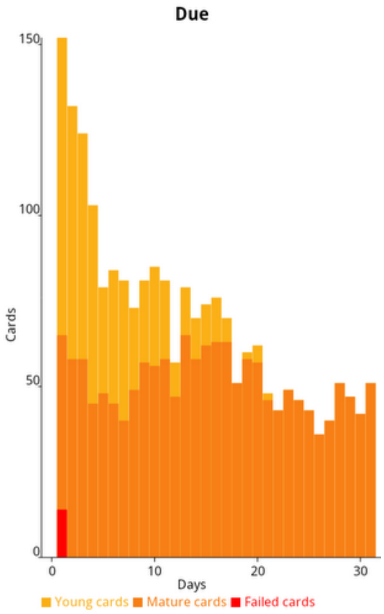


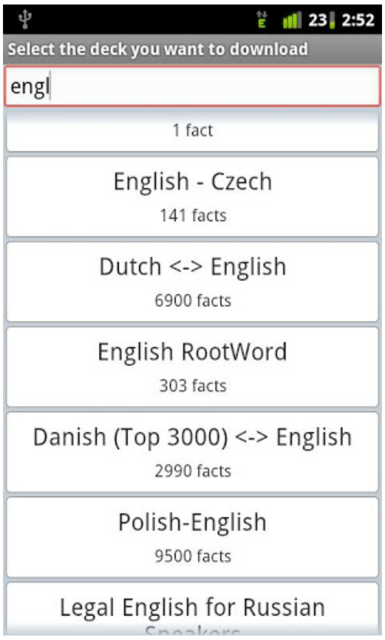
Figure 2: AnkiDroid Screenshot : Displaying learning progress

1. unknown information found (for example, in a browser)
2. new deck or simply new cards started in Anki
3. search for the meaning started (browser, photo application, etc.)
4. needed meaning found
5. second side of the card filled in back in Anki

The required application switch process decreases user productivity. Moreover, due to the nature of Android activities life cycle, it could be, that within such switching, due to the lost of a current state, the user will need to repeat the work twice (creating cards, after unfinished was discarded, for example). This motivates adding to the application itself information providing capabilities. Among such capabilities we consider the usage of embedded recording and capturing devices, as well as search on the available on the Web resources for information (for example, Google images sarch, Beolingus dictionary, Wikipedia, etc.)

Summarizing, there is a broad spectrum of opportunities towards improving in a meaningful and requested by community way the application. Trying to implement some of the mentioned features for the application represents the goal for the project.

It is worth mentioning, that dislike many existing student toy-applications, the modification of AnkiDroid represents a real world project. The appli-



23 2:52

Select the deck you want to download

engl

1 fact

English - Czech
141 facts

Dutch <-> English
6900 facts

English RootWord
303 facts

Danish (Top 3000) <-> English
2990 facts

Polish-English
9500 facts

Legal English for Russian
Speakers

Figure 3: AnkiDroid Screenshot : Loading existing deck from a web service.

cation for the Android under question is not only extremely popular (more than 100.000 downloads), but is also very reliable, and has clear above average (4.5+) rating. Application represents a client for Android, however it must well integrate with all other existing clients as well as the web service, provided by Anki project, which enables, for example deck exchange.

Thus development features on top of such application:

1. is a challenging task for student level programmers
2. requires certain level of quality during development
3. requires maturity of each feature for publishing
4. allows for real-world project experience
5. puts consideration on the visual integrity with existing software
6. introduces need to research on the existing code base, and
7. brings up the need in considering and validating integration

2 Standards overview, short comparison

In electrical, electronic and programmable electronic (E/E/PE) systems development certain standards exist. Following the standards is necessary, in particular, for the end product to pass the certification and be allowed for production and usage.

The safety standards are usually application-domain specific.

What we're talking about (see Figure ??).

3 Development cycle intro, V-Model

4 Standard Case : ISO 26262

4.1 System Level Development

4.2 Development on the Software Level

5 Introduction to Safety Integrity Classes

The core points, concisely explained with a clear content derivation. (See Table 5, more details in section A).

explains the basics of functional safety.

C	C	C
text	100	text
text	200	text
text	300	text
text	400	text

Table 1: For tabular representations

6 Conclusion

Lessons learned or especially noteworthy info.

References

Anki. Google code website, wiki with feature requests.

Anki. Homepage.

A Appendix and addendums

Special focus areas or extra info that is not specifically placeable within the above sequences.