A CROWD-SOURCING MOBILE PLATFORM FOR TEXTBOOK SELLING AND EXCHANGE USING INFORMATION RETRIEVAL

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ABSTRACT

Book selling and exchange is very popular among students at campus, especially at the beginning of each semester, which can save students' expense on text books. Generally, a used book may be only worth one third or half of the original price or even less. However, existing book selling platforms have various issues in practice, such as not user-friendly, not efficient, or not widely used among students. In this paper, we develop a new book selling and exchange platform, which facilitates the distribution of book selling information and the communication between sellers and buyers. This application can be easily used on smartphone after it is properly downloaded and installed from app store.

KEYWORDS

Book selling platform, distributed system, iOS and Android system, Firebase

1. INTRODUCTION

At every beginning of the school year, all the students need to purchase new books for the next school year [1], while having a certain number of old books which is no longer required by the students. The students do not always deal with the books in an environmentally friendly way—usually throwing them away. However, many of the used books are like new, or acceptable for another student to use for an extra year.

Recently, a number of websites enable students to buy back the used books and purchase second-hand books for the new school year [2][3]. Usually, the website opens for students in mid-July for students to purchase their textbooks for the new school year and choose to buy a second-hand textbook. And in late May or early June the year after, some staff members show up and students bring all their books for buying back. Besides, some students use applications such as Snapchat or Instagram to look for a buyer, both through private message and group chat. If successful, the students are enabled to recycle the textbooks and do a better saving [4].

However, the current platforms are not user-friendly for students to make textbook recycling [5][6]. Many students are unable to show up for buying back as they may either be sick or have a conflict [7]. Besides, the websites only support certain types of books for buying back, for example, some schools may purchase text books for certain subjects for students on a website, while order books, which cannot be purchased from the previous websites, for other subjects

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from a book store. Therefore, students have to return books to two different spots, or they can only return part of their books. Other students choose to find buyers from communicating applications. However, this is a highly ineffective way because students need to ask their classmates one by one. There is also an alternative way by doing group chats: posting information of books and wait for a buyer in the same group. This is not efficient enough either because students spend longer time looking for the books, they want from the other useless conversations posted by other students [8][9][10].

Considering the above issues within current platforms, we develop a user-friendly application to build a platform for book selling and exchange. In this paper, we display a new application which provides a platform for more convenient book selling and recycling. The platform does not require certain dates for students to buy back. In addition, it enables students to find a buyer with less thing to do. It also enables students to communicate individually with the seller without disruption from other students in the group chat.

The rest of the paper is organized as follows: Section 2 gives the details on the motivations that we work on this topic. Section 3 gives the details on the that we met during the experiment and designing the sample; Section 4 focuses on the details of our solutions corresponding to the challenges that we mentioned in Section 3; Finally, Section 5 gives the conclusion remarks, as well as pointing out the future work of this project.

2. MOTIVATIONS

Some of platforms have been developed to do book recycling, which allows students to exchange or purchase books they needed. Basically, there are two kinds of platforms, including some websites which is specially designed for bookselling and recycling, and some chatting platforms which enable students to create a group chat and discuss the information about their books and look for a buyer. The following two applications are typical platforms that we mentioned above.

2.1. E-follett

This is a website specially developed for students buying books and buying back for recycling. It is convenient to use when students are buying books from the website. However, when it comes to buying back, the situation is different. Every year, some people go to the schools on a certain day for buying back. At that time, there will be lines and lines of students waiting in the queue. Most students waste almost a century in waiting for buying back. Worse still, some students may be absent on that day, which means that they miss the buying back and have to return them in person or mailing it back. The situation sets barriers in recycling the books and therefore should be changed.

2.2. Wechat

Many students use chatting applications to talk about book exchanges. As an International student, I witnessed some other exchanged students talking about exchanging textbooks in Wechat. I myself tried using the platform and look for buyers by asking individually. As a result, I felt it extremely ineffective. I also saw some people talking in a group chat. Once I posted a piece of information, but it was buried by the subsequent, irrelevant messages. It may give people a hard time in finding the book information previously posted by a seller. Therefore, an application should be designed to help to look for buyers and remind the sellers if their books are in need.

3. CHALLENGES

There are some challenges in building the application and make it user-friendly application should work on both IOS and Android systems. First, in U.S. the most widely used operating systems on phones are IOS and Android. In order to enable most people to use the application, it is important for the application to run on both systems. However, this usually means to write two sets of codes, which is time consuming and tiring, or to find a platform to make conversions.

Second, there is a difficulty in finding an appropriate data base to test whether the application works. The application is mostly developed in China (When I am taking summer break back home) where some important websites for data bases cannot be used (like google firebase). As I will be unavailable after going back to U.S., I have to make as much progress as possible. However, having an available database is crucial in testing the application, or most part have to be done when I get back to U.S. (when I will be busy).

Third, it is challenging to find a sufficient number of users. As further experiments in researching whether the application works well and the usage of different textbooks need a substantive number of users, it is necessary to make a propaganda for the application among students. Only with an enough sample, the experiments can be carried out to test whether the application meets the students' satisfaction as well as predicting the using trend of the textbook.

4. SOLUTION

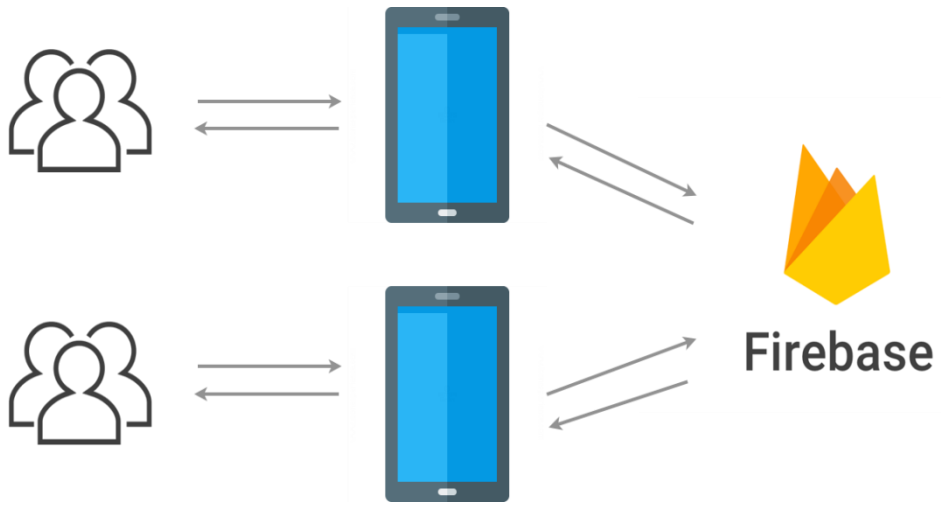

Figure 1. The overview of the system architecture

The app is built based on a typical distributed system model (Figure 1). Users are divided into two different types - sellers and buyers. Sellers use the app to post books, which will be saved in the Google Firebase database. Buyers use the app to search and query the books by reading the data from the Firebase database. The Firebase database provides a real-time notification engine that allows users to get the updated information promptly.

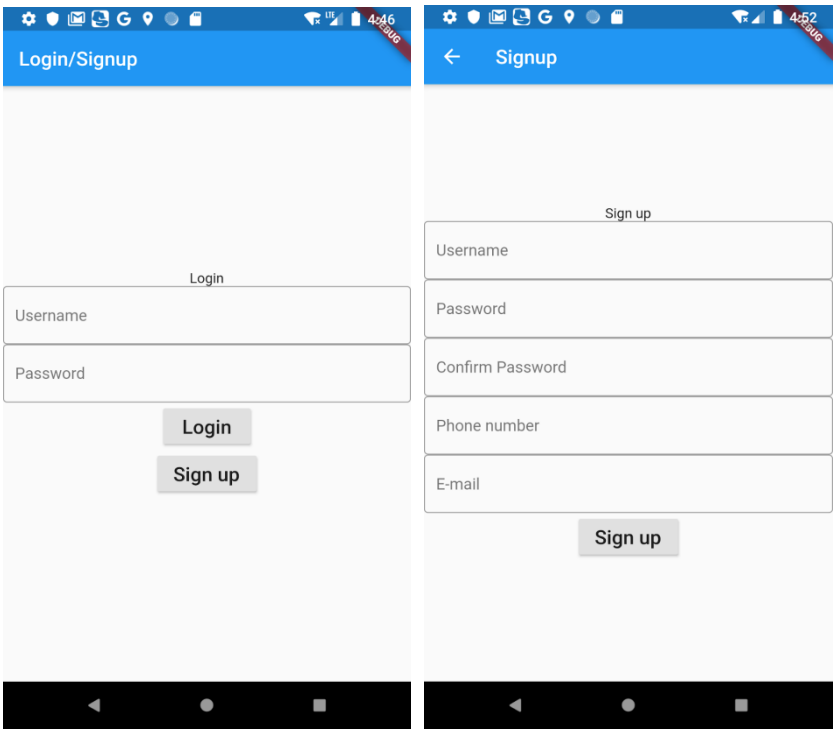

Figure 2: App sign up/login

A simple and quick registration (Figure 2 left) that allows you to create an account and log-in via email. Once the user has created an account and logged in (Figure 2 right), he/she will be able to sell/buy books through our application.

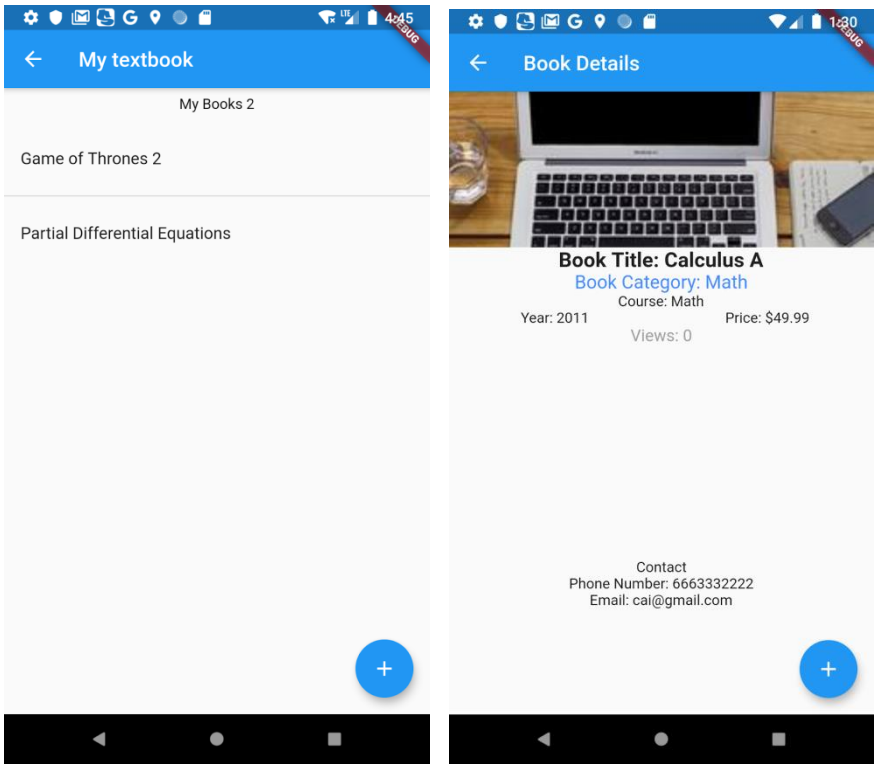

Figure 3: My textbook and book details

Once the user has logged in, he/she will be redirected to the 'My textbook' screen (Figure 3 left). This screen displays all the books the currently logged in user has added over time. The list is ordered by recency and the user can tap into a specific book to view the details for that particular listing. Tapping on the 'Plus' icon at the bottom right allows the user to create a new book listing.

After the user taps on a particular book listing (either from "My textbook" or "All Books"), he/she will see a screen that details the information about that listing (Figure 3 right). This includes the book title, category, subject, year, price, and the seller's contact information. This allows any potential buyer/seller to view the details for that particular listing.

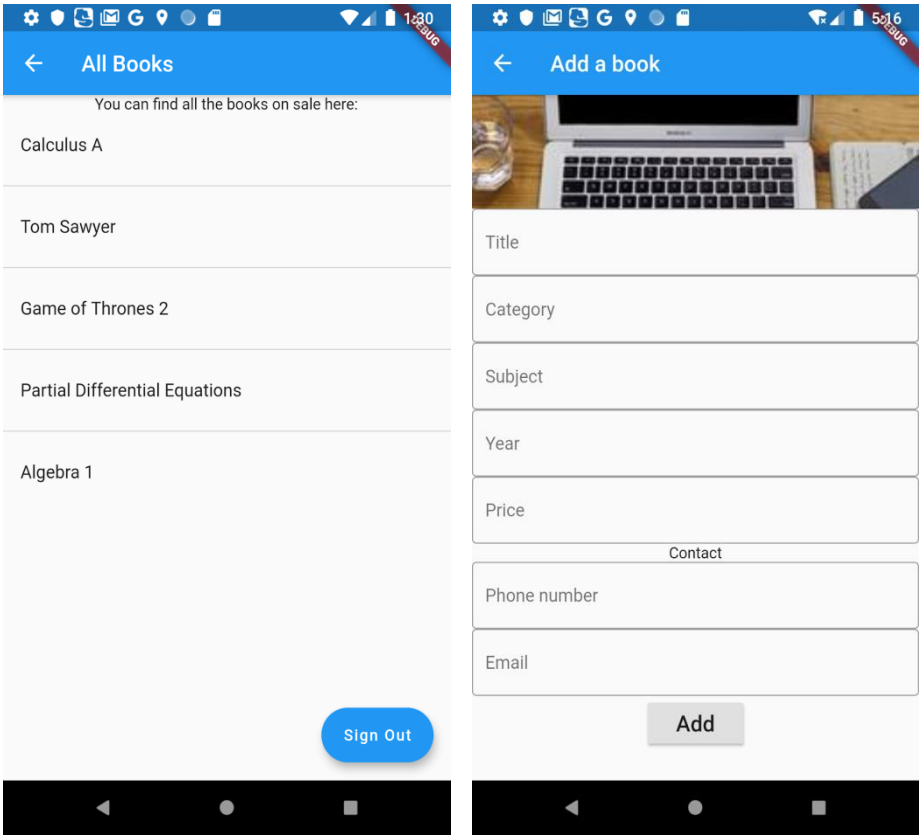

Figure 4: All books and add a book

This screen (Figure 4 left) displays the list of books that are available on the market. Every book that has been added by any user will show up on this screen (ordered by recency). Tapping on a particular listing will lead the user to the "Book details" page, where he/she can view the details about that book and the contact information of the seller. Tapping on the "Sign Out" button at the bottom right of the screen allows the user to sign out of the application.

Tapping on the 'Plus' icon from 'My textbook' leads the user to this 'Add a book' screen (Figure 4 right). This screen allows the user to enter information (title, category, subject, year, price, contact information) for a book that he/she wants to sell on the market. Tapping on the 'Add' button adds the book to the currently logged in user's 'My textbook' list, and also to the 'All Books' list for all users to view.

5. RELATED WORK

Book selling or exchange application, website or app, is very popular among students, which can benefit them to purchase or exchange those books that they need in study, such as E-follett, Amazon, Dangdang, Half Price Books, Powell's Books etc [11][12].

BookScouter provides the used book and textbook price comparison engine which helps users search and compare real-time offers from over 30 websites. It can greatly facilitate the selling or purchasing a book in an easy way.

Half Price Books is a great solution for selling your books [13], which allows users to pack up their books, bring them in, and then wait at the store while a bookseller assess them.

Like Half Price, Powell' Books allows users bring books in to their stores for appraisal or sell to them online if users are not convenient to come to stores. Powell' Books has a good book condition, which support search a book through ISBNs in collection. Also, it supports PayPal or store credit to get money [14][15].

6. CONCLUSIONS

Application should work on both IOS and Android systems. Through browsing all kinds of application developing software, I finally found a software named flutter. It uses a programming language called dart - a language based on java, which I am good at. Besides, the software has a function of generating IOS applications and Android applications through the same code. It could save a lot of time to develop the application.

There is a difficulty in finding an appropriate data base to test whether the application works. By doing the research and under the help of my mentor, we developed a temporary database by modifying the file "auth". Therefore, will be able to test some functions on the applications. However, we still need to change the database to Firebase in Google for permanent usage.

It is challenging to find a sufficient number of users. The fastest way to find users is looking for my classmates in our school. This year, they can try to use the application by selling and buying textbooks for the incoming school year.

REFERENCES

[1] Sewall, G. T. (2005). Textbook publishing. *Phi Delta Kappan*, *86*(7), 498-502.

[2] Koch, J. V. (2006). An Economic Analysis of Textbook Pricing and Textbook Markets. ACSFA College Textbook Cost Study Plan Proposal. *Advisory Committee on Student Financial Assistance*.

[3] Butler, D. (2009). Technology: The textbook of the future. *Nature News*, *458*(7238), 568-570.

[4] Miller, J. R., Nutting, A. W., & Baker-Eveleth, L. (2013). The determinants of electronic textbook use among college students. *The American Economist*, *58*(1), 41-50.

[5] Bauer, J. M. (2014). Platforms, systems competition, and innovation: Reassessing the foundations of communications policy. *Telecommunications Policy*, *38*(8-9), 662-673.

[6] Nagle, P., & DeSantis, W. (2007). Internet textbook exchange. *U.S. Patent Application No. 11/325,227*.

[5] Bauer, J. M. (2014). Platforms, systems competition, and innovation: Reassessing the foundations of communications policy. *Telecommunications Policy*, *38*(8-9), 662-673.

[8] Apple, M. W. (2012). The culture and commerce of the textbook. In *Knowledge, Power, and Education* (pp. 162-177). Routledge.

[9] Baker, D. C., & Hileman, J. (1987). Used books and the college textbook industry. *Publishing Research Quarterly*, *3*(3), 8-17.

[10] Ipince, R. (2011). *Improving the textbook exchange system at MIT* (Doctoral dissertation, Massachusetts Institute of Technology).

[11] Visgilio, G. (2013). Analysing emission compliance in the textbook model. *Australasian Journal of Economics Education*, *10*(1), 32-38.

[12] Bai, X., & Luo, M. (2011). How much is trust worth? Evidence from the international online textbook market. *Journal of Internet Commerce*, *10*(4), 245-260.

[13] Kreder, K., Daftuar, R., & Adams, M. (2006). Internet based textbook price comparison method using entered course identification."*U.S. Patent Application No. 11/256,546*.

[14] Booth, C., Lewis, H., Quesada, D., Taylor, M., Crawford, B., Gamble, N., & Huibonhoa, P. (2013). System for and method of managing book sales and rentals. *U.S. Patent Application No. 13/547,969*.

[15] Howlader, H. O. R., Saber, A. Y., & Senjyu, T. (2019, March). Comparison Approach for Reducing "Demand Response of Consumers" and "Cost of Utility Companies". In 2019 IEEE PES GTD Grand International Conference and Exposition Asia (GTD Asia) (pp. 757-761). IEEE.