Wolf-Share: Book Sharing Application

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ABSTRACT

One of the major problems faced by students in libraries is the long waiting list at most libraries when a new book arrives or a new edition is printed. This limited availability of books causes a lot of students to miss out on the latest novels or more importantly the crucial last week of finals. The libraries face a similar dilemma, it is impossible for them to keep a copy for every student in the class, let alone the faculty and other researchers at the university mainly due to lack of funding. Although there exist many applications which allow its users to lend books in their user-base, these applications face two major problems: First, they charge a fee on behalf of the borrowers, this discourages many people from subscribing to such applications. Secondly, they do not have a varied book base, i.e. the users of these lending applications do not possess rare books or research papers which are crucial for college students and professors alike. The solution to this problem is to integrate the services provided by the library and that of such applications into one application where the library can act as a central body for the entire community, from college students to residents around the area. This integration would not only expand the resources at the libraries' disposal (due to contribution by other users), but also solve the problem of shortage of books that the libraries face.

1 INTRODUCTION

Lack of availability of multiple copies of a single book is one of the major problems which libraries face. Due to lack of funding and feasibility, it is not possible for libraries to keep multiple copies of the same book and it becomes difficult for students to get book during the crucial finals week.

There have been many book lending applications which help users to get books for a short amount of time but they have several problems. One of the major problems these applications face is the lack of availability, it is rare to find field oriented books among the user-base of such applications and it usually comprises of novels and storybooks, this also affects the variety of the app making it the user-base and the book-base very acute. To counter these problems, the applications charge a fee, mainly shipping from a far-off location. This fee discourages many users from using the application. Moreover, the lack of development in this sector has produced half-enthusiastic projects which have a lot of software as well as management problems.

The application proposed in this report is a web-application which aims to bridge the gap between these applications as well as the lack of books in libraries. It will allow users of a specific area, say a zip code or a county, to lend books among themselves through a central body (in most cases, the library). This would allow users, including college students to share books which they have borrowed, among themselves in a secure manner, as well as allow the people of the county to share books among themselves and the library. This would expand the book-base of the library as it would include potential lenders from the county community and thereby reducing the problem of book shortage. This would also enable the county community to share books among themselves, which they borrowed from the library or their own, in a safe and secure manner.

2 USER SURVEY AND INFERENCE

The User Survey captured the views of 70 NCSU students on booking sharing system. The questions ranged from the need of book sharing to the willingness to lend one and the requirements from the system that will facilitate book sharing. The survey was sent primarily to students across the globe to get a diversity of responses. This gives us a student's perspective based on the culture and current financial condition of countries across the world for the Book Sharing Application.

Question 1:- *Do you face problems when you want a book which is not available in the library and is very expensive online?*
This question was asked to get information on how many students have faced a problem of needing a book which is either in library but checked out by other student, or, not at all available in library and available at e-retailers but is very expensive and thus debarring user from buying it. This question in general was to find the difficulties users face in absence of book sharing system.

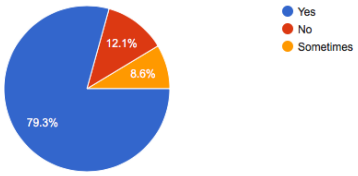

Figure 1: Donut Chart of Percentage of people facing problem when a book is not available in library (and the book is costly).

Almost everyone faces problem when they need a book which is not available in the library or is on hold by someone. Also, some books are too costly to buy.

Question 2:- *If yes, would you like a secure web-app that helps you find lenders who are willing to share their books for some time for free?* Through this question we wanted to get a percentage of surveyors who could be a potential borrower of book in the system provided that the system was web based, secure, providing fixed period of book borrowing for free and contained authenticated user base i.e. Wolfpack Community.

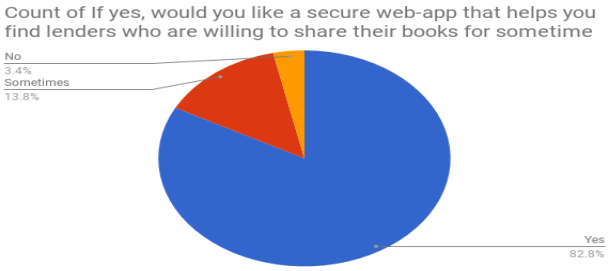

Figure 2 Pie Chart showing Percentage of people who would like to have a Web App for book sharing.

About 83% of people would like to have a Web Application to allow book sharing with peers at NC State University. This clearly shows that there are times when students want some book which may be costly or might not be available at library or checked out by someone who may not be using it. Thus, book sharing may help students with studies and finances.

Question 3:- *As a lender, would you like to share a book, which is lying around, with a book-enthusiast?* Active book lenders are the sole resource of book circulation within book sharing system. And without book lending activity the sharing system would not operate effectively. Thus, with this question we were able to capture the percentage of students who would be willing to share their book both personal and that of NCSU Library through this system. Hence, this information helps in knowing the estimate of book lenders in system.

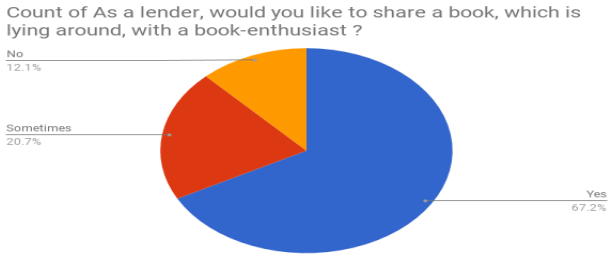

Figure 3 Pie chart showing Percentage of people who would like to share the book.

The results of this question clearly show that majority of people who have books which are lying idle in their book stack would like to share them with book enthusiast. While there are people who might want to share it only sometimes is because they might not trust the borrower with the book. This is the issue which can be solved through two-way review system and penalties for book damage. While the technological system has some flaws, it can be corrected by bringing in a central governing body such as Library.

Question 4:- *If yes, would you like to lend it for free?* As a follow up question we wanted to get an estimate about percentage of lenders who are willing to lend their books for free. This question is vital as this project aims at creating book sharing system which is free for both book lender and borrower without any commission for any entity involved.

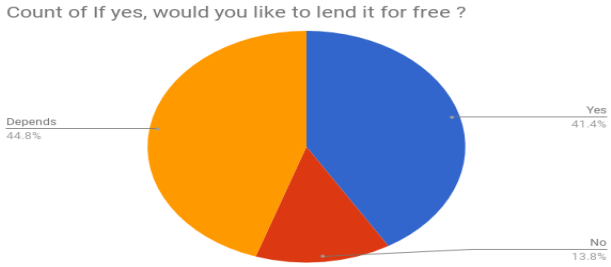

Figure 4 Pie chart showing percentage of people who are willing to lend the book for free.

The survey results how that about 42% people are ready to lend it for free while about 45% people say that they are not always ready to lend it for free. So, we can infer that we need to allow users to lend a book at some price.

Question 5:- *How would you like to get the book?* The system by default will be providing three different options for borrower/lender to share the book; pick up from lender's place, get it shipped by lender, or meet with lender. Through this question we aimed at understanding the most preferable method of sharing the book.

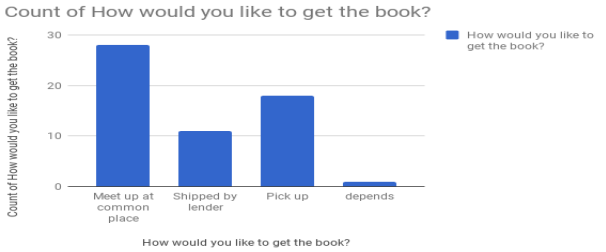

Figure 5 Bar Chart to show how would people like the book to be delivered.

The survey clearly shows that most of the people would like to receive the book by meeting at some common place. Thus, the book sharing app may also help to increase the networking among the wolf pack community.

Question 6:- *Would you like lender and borrower rating for lending and borrowing?* It is possible that the required book is available from many lenders and thus in that case knowing the rating of the lender helps in choosing the right lender. Same applies for lender having multiple borrow request. Thus, through this question we wanted to get an idea of what percentage of user will prefer having ratings.

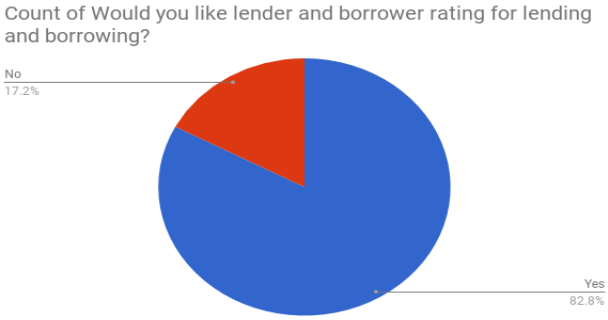

Figure 6 Pie chart showing percentage of people who would like to have lender and borrowing rating.

As per the survey majority of lenders would like to have the borrower rating before lending the book and vice versa.

Question 7:- *Would you agree to review after lending or borrowing (to help other users)?* This question helped in understanding the percentage of users who would be willing to review the lender/borrower. These reviews could both help determine rating and knowing the records of borrower/lender.

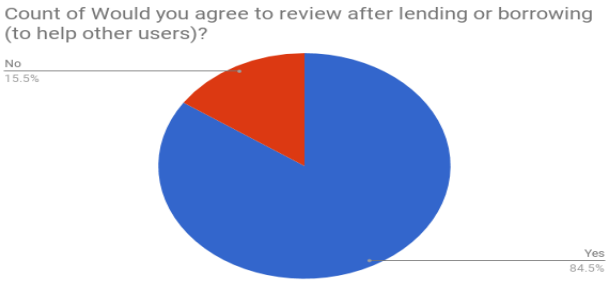

Figure 7 Pie chart showing percentage of people who willing to record a review for lender or borrower.

Almost 85% of people agree for the compulsory review hence it clearly shows we won't need to pay people to get reviews. Hence, we can keep some negative credits for each review not done.

3 TECHNOLOGIES AND PROGRAM FLOW

3.1 Python

Python is an interpreted high-level programming language for general-purpose programming. Python would be used as a backend programming language.

3.2 Django

Django is a free and open-source web framework, written in Python, which follows the model-view-template (MVT) architectural pattern. Django's primary goal is to ease the creation of complex, database-driven websites. Django emphasizes reusability and "pluggability" of components, rapid development, and the principle of don't repeat yourself. Python is used throughout, even for settings files and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models. Django will be the web framework used to develop the Web application.

3.3 PostgreSQL

PostgreSQL, often simply Postgres, is an object-relational database management system (ORDBMS) with an emphasis on extensibility and standards compliance. As a database server, its primary functions are to store data securely and return that data in response to requests from other software applications. It can handle workloads ranging from small single-machine applications to large Internet-facing applications (or for data warehousing) with many concurrent users; on macOS Server, PostgreSQL is the default database; and it is also available for Microsoft Windows and Linux (supplied in most distributions). PostgreSQL is ACID-compliant and transactional. PostgreSQL has updatable views and materialized views, triggers, foreign keys; supports functions and stored procedures, and other expandability. PostgreSQL will be our primary database used to store book and user data.

3.4 JavaScript

JavaScript, often abbreviated as **JS**, is a high-level, dynamic, weakly typed, prototype-based, multi-paradigm, and interpreted programming language. Alongside HTML and CSS, JavaScript is one of the three core technologies of World Wide Web content production. It is used to make webpages interactive and provide online programs, including video games. As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative (including object-oriented and prototype-based) programming styles. It has an API for working with text, arrays, dates, regular expressions, and basic manipulation of the DOM,

but the language itself does not include any I/O, such as networking, storage, or graphics facilities, relying for these upon the host environment in which it is embedded. JavaScript would be used to manipulate API response from the server.

3.5 HTML5/CSS3

Hypertext Markup Language (**HTML**) is the standard markup language for creating web pages and web applications. **Cascading Style Sheets** (**CSS**) is a style sheet language used for describing the presentation of a document written in a markup language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.
HTML would be used to create forms and CSS would be used to beautify web pages.

3.6 HTML5/CSS3

jQuery is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML. jQuery's syntax is designed to make it easier to navigate a document, select DOM elements, create animations, handle events, and develop Ajax applications. jQuery also provides capabilities for developers to create plug-ins on top of the JavaScript library. This enables developers to create abstractions for low-level interaction and animation, advanced effects and high-level, theme compatible widgets. The modular approach to the jQuery library allows the creation of powerful dynamic web pages and Web applications.

3.7 Trello

Trello is a web-based project management application. Trello would be used to assign work and check the status.

3.8 Application Flow and Timeline

The program flow and the expected timeline is shown below:

Task	Start Date	End Date
Planning Phase	01-27-2018	01-27-2018
Development Phase	01-28-2018	02-18-2018
Testing Phase	02-19-2018	02-20-2018
Deployment Phase	02-21-2018	02-24-2018
Acceptance Testing	02-25-2018	02-27-2018
Analysis Phase	02-28-2018	02-28-2018
Final Submission	03-01-2018	03-01-2018
Presentation	03-12-2018	03-12-2018

Table 1: Expected timeline of the project.

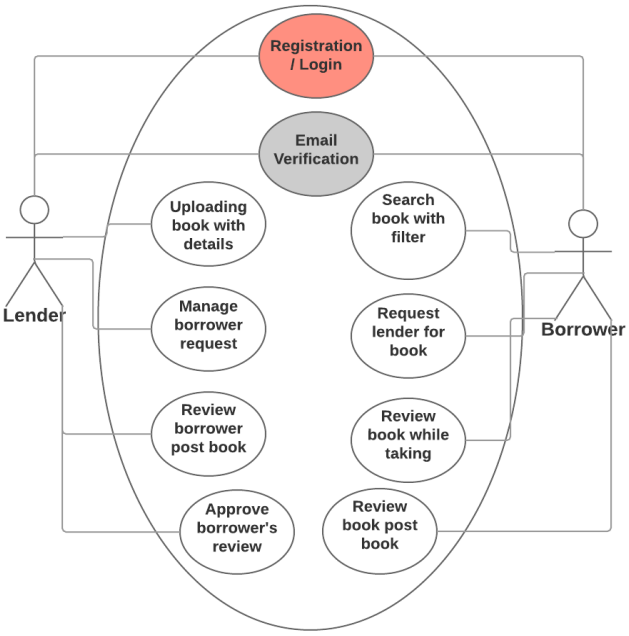

Figure 8: **UML diagram of the application.**

4 LITERATURE SURVEY

4.1 Existing Systems

4.1.1 NCSU Library

NCSU libraries give books to their students through their NCSU id. The books of the library are also accessible by citizens of Raleigh by following some different procedure. The student of NCSU can borrow the book from library for maximum 3 months. If some book requested by the user is not present in the library, the user can request the book by making a trip saver functionality using which the user can request the book, which the library requests to their other sources and the user will be notified, once the book is received by the library. This whole process takes around 3 to 4 days till the user gets the book.
The whole system seems like it is thought keeping in mind that the users always get books they want. But the problem rises, when all the copies of book requested by the user are checked out. Similar situation rises frequently when there is an exam week going on within the university. To handle such situations, library have a procedure which takes a very long time, if the user wants the book in emergency.

4.1.2 Free-eBooks.net

Free-ebooks.net offers unlimited free access to eBooks in HTML format and access to five eBooks each month in pdf and/or txt format. The system asks the user to create an account on his/her name. After creating the account, a confirmation email is sent to mail used during the signup process. After that, the user is asked to select the category of which he/she wants the book of like fiction, non-fiction, educational textbooks, and others. After selecting the category, it displays the books based on the category

selected along with the formats in which the book is available. The user selects the book which he/she is looking for and then on the next HTML page, it asks to download in the format in which the user wants to and the user can also add it to the library of his/her own.

Even though the system seems well thought, the only drawback is that all the books are in eBook format, or a format which can be read on the electronic device like laptop, Personal Computer, smartphone or a tablet which not all the users like to do. Some people are used to reading books in physical form. Also, some formats of books are limited to 5 downloads per month. If a user wants to upgrade, he/she has to become a VIP account holder for which a payment needs to be paid.

4.1.3 booklending.com

BookLending.com is a kindle book lending and borrowing website owned by Amazon from which a user can borrow or lend a kindle Book. To use the system, the user has to create an account using his/her email id and password. After that, the user can search through the repository of Kindle books which are available for borrowing or can lend a Kindle book owned by him/her. The user also gets notifications from the system, if some user requested the book owned by him/her.

The system seems thoughtful but there are some bugs in the system. It allows me to lend a book which I don't own. I cannot see the books in my profile which I previously lend. The system doesn't check whether the email id provided during creation of the account is valid or not. No security system like one time password or validation code or email verification system was used by the system. The biggest drawback of the system is that it only lends Kindle books. The system focuses only on users who owns a Kindle device.

4.2 Future Scope

As of now, we are planning to focus on the NCSU community as the users of the systems so that the users of the systems can be authenticated easily. In future, the system can be scaled to handle the users other than NCSU community. Also, the system can be integrated with NCSU library website which the students can access if they cannot find the book they need from the library. Libraries of all the universities of United States can integrate the system with their library website by helping their students get the books fast and easily.

5 CONCLUSION

The User Survey and Literature Survey carried out as a part of this project reflected the need of students to refer books that are potentially owned/reserved by other students. At the same time it reflected the willingness of the student owing the book to lend it to fellow students for a fixed period of time. Existing system at first suffers from unverified user base and also include commission fee, which in all deteriorates user experience. Thus, a free, secure web application catering to authenticated Wolfpack community of 42,824[1] members (33,755 students) can act as a great medium for lending and borrowing book. This application apart from catering to the book needs of Wolfpack Community also enables them to meet other members of community and moreover results in virtual increase of NCSU's book resource.

REFERENCES

[1] ACM 2017 Conference Paper Format. https://www.acm.org/publications/proceedings-template.

[2] I. F. Akyildiz, W. Su, Y. Sankarasubramaniam, and E. Cayirci. 2002. Wireless Sensor Networks: A Survey. *Comm. ACM* 38, 4 (2002), 393–422.

[3] David A. Anisi. 2003. *Optimal Motion Control of a Ground Vehicle*. Master's thesis. Royal Institute of Technology (KTH), Stockholm, Sweden.

[4] P. Bahl, R. Chancre, and J. Dungeon. 2004. SSCH: Slotted Seeded Channel Hopping for Capacity Improvement in IEEE 802.11 Ad-Hoc Wireless Networks. In *Proceeding of the 10th International Conference on Mobile Computing and Networking* (MobiCom'04). ACM, New York, NY, 112–117.

[5] Kenneth L. Clarkson. 1985. *Algorithms for Closest-Point Problems (Computational Geometry)*. Ph.D. Dissertation. Stanford University, Palo Alto, CA. UMI Order Number: AAT 8506171.

[6] Jacques Cohen (Ed.). 1996. Special Issue: Digital Libraries. *Commun. ACM* 39, 11 (Nov. 1996).

[7] Bruce P. Douglass. 1998. Statecarts in use: structured analysis and object-orientation. In *Lectures on Embedded Systems*, Grzegorz Rozenberg and Frits W. Vaandrager (Eds.). Lecture Notes in Computer Science, Vol. 1494. Springer-Verlag, London, 368–394. DOI: http://dx.doi.org/10.1007/3-540-65193-429

[8] Ian Editor (Ed.). 2008. *The title of book two* (2nd. ed.). University of Chicago Press, Chicago, Chapter 100. DOI: http://dx.doi.org/10.1007/3-540-09237-4