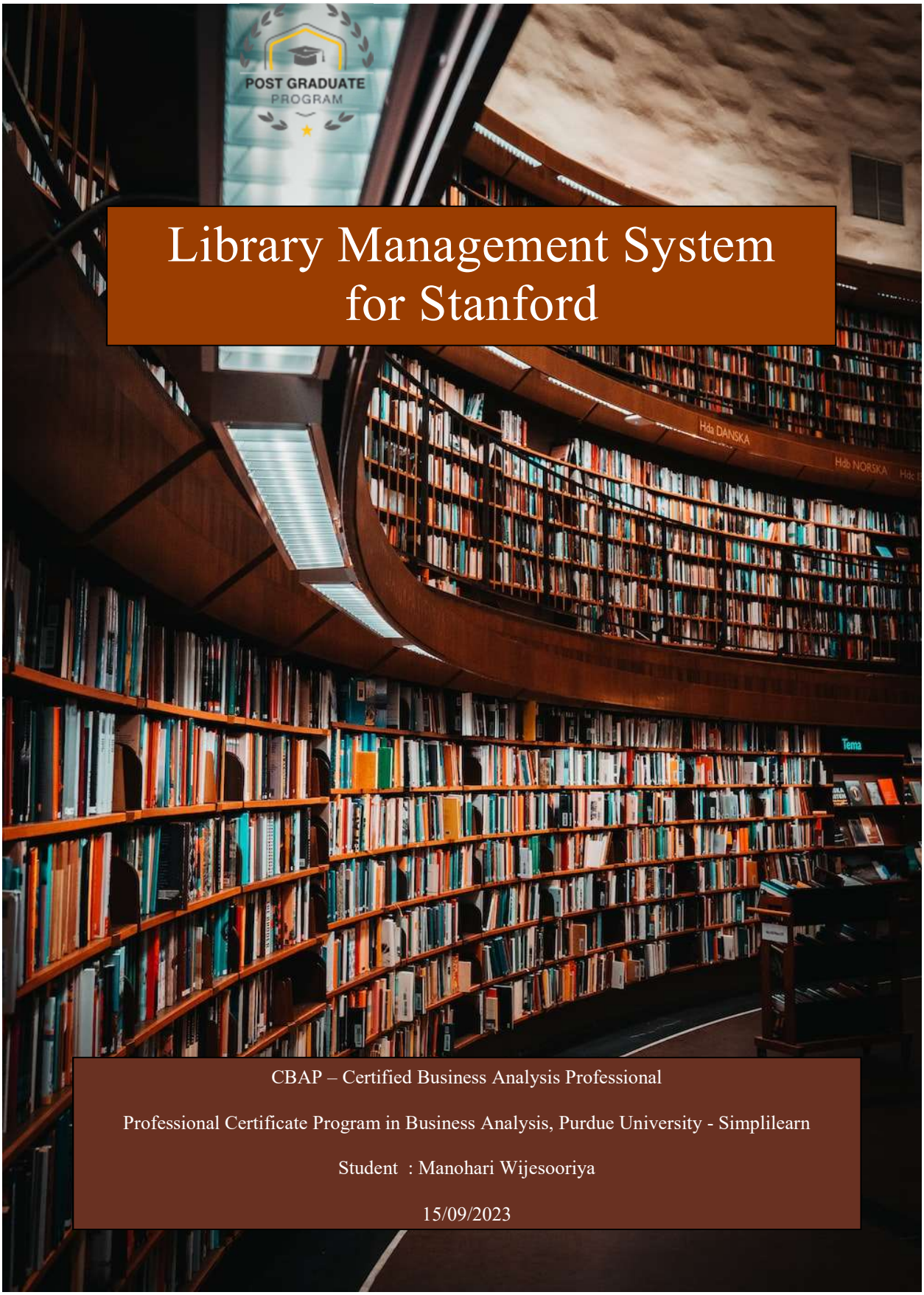

Library Management System for Stanford

CBAP – Certified Business Analysis Professional

Professional Certificate Program in Business Analysis, Purdue University - Simplilearn

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Contents

1. Introduction

Stanford University is a private research university in California. The university was founded in 1885 and as of today, 83 Nobel laureates, 28 Turing Award laureates, and 8 Fields Medalists have been affiliated with Stanford as students, alumni, faculty, or staff.

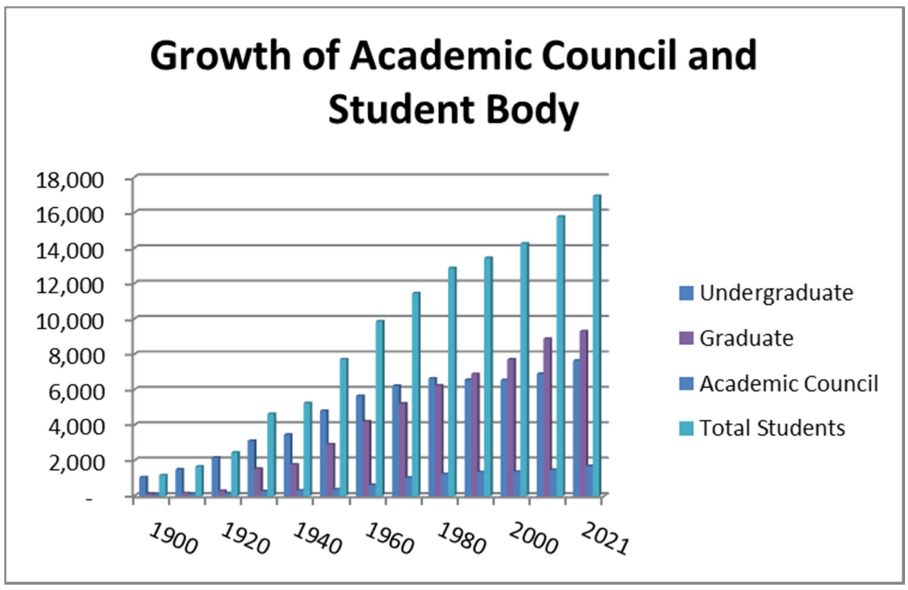
For the benefits of the students Stanford started its own library in 1885. The library at Stanford was housed in one large room capable of accommodating 100 readers. As the university grew to enroll more than 16,000+ students in a given year the library grew as well. Today the library boasts of having more than 4 million books in it.

The paper based maintaining, organizing, and handling of countless books became a nightmare. The university wanted a **Library Management Software** (**LMS**) to automate their library's activities. Using the software one can find books with a click, issue/reissue books quickly, and it will manage all the data efficiently using this system. It also provides immediate and accurate information regarding any type of book, magazine, or research paper, thereby saving a lot of time and efforts.

2. Problem Definition and Solution

Problems with the manual library:

- A lot of time is wasted managing the manual library.
- The number of employees needed to manage the library is high.
- Fine calculation is a tedious and time-consuming affair.
- No reports could be generated on books issued due to the manual system.
- It is difficult to manage 4 million books present in the library.
- Students could deposit the books only in the library timings.



3. Advantages of LMS

- Reduce overheads and increase the productivity of library staff.
- Cost reduction.
- Up-to-date records of all books, research papers, magazines, and other materials available in the library.
- Improve student engagement in the library.
- It will generate dynamic reports for better decision-making.
- Allowed preferred access point, physical, desktop workstation, or mobile.
- Improved learning experience and educational benefits associated with ease of use.

4. Stakeholders

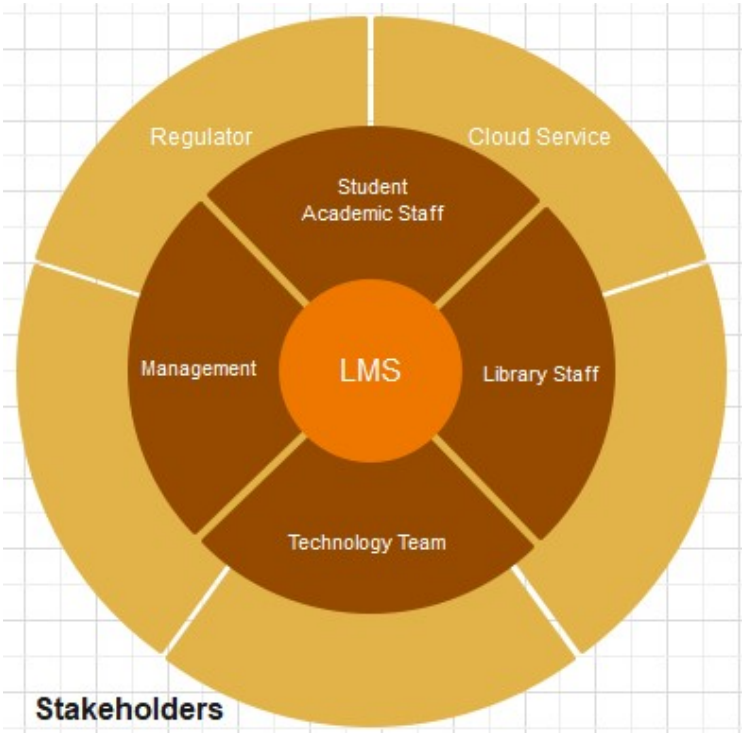
Stakeholders of the LMS are identified as this.

Internal

Actor	What can they do on the software created?
Student	Access to the library system online to know the return date Access to LMS via wed or mobile interface Access to free e-journals and free e-books Select a reading material from library and tagged his name by library staff along with the book he borrowed Return the book at any time in the RFID enabled book drop box station Receive automatic emails 3 days before the return date of book
Academic Staff	Access to the library system online to know the return date Access to LMS via wed or mobile interface Access to free e-journals and free e-books Select a reading material from library and tagged his name by library staff along with the book he borrowed Return the book at any time in the RFID enabled book drop box station Receive automatic emails 3 days before the return date of book Allow longer lending period of book than for students Authorize access for special areas in the library such as archive or special collection.
Library Staff	Use a RFID reader to capture the details of the book and connect borrowed book with student. Search for the books on the LMS search criteria Enter details of new books to the LMS Instruct lenders on using LMS
Management	Buy the RFID readers and tags Adjust exit gate to set the anti-theft detection Buy and install book drop box stations Train library staff Implement new LMS software Maintain server and cloud storage for LMS
Technology Team	Develop LMS system Design Cloud system architecture Develop access interfaces Prepare business case documentation Test LMS with various use cases.

External

Actor	What can they do on the software created?
Cloud service Provider	Provide cloud service for LMS Issue bills for service Educate Stanford Technology team on use of Cloud service
Regulator	Follow up with Management on maintenance of Library Management standards



5. Existing System

Existing system is a manual process. Library maintain catalog of books in a book register.

They maintain a separate register to note down the book id and lender id on daily basis.

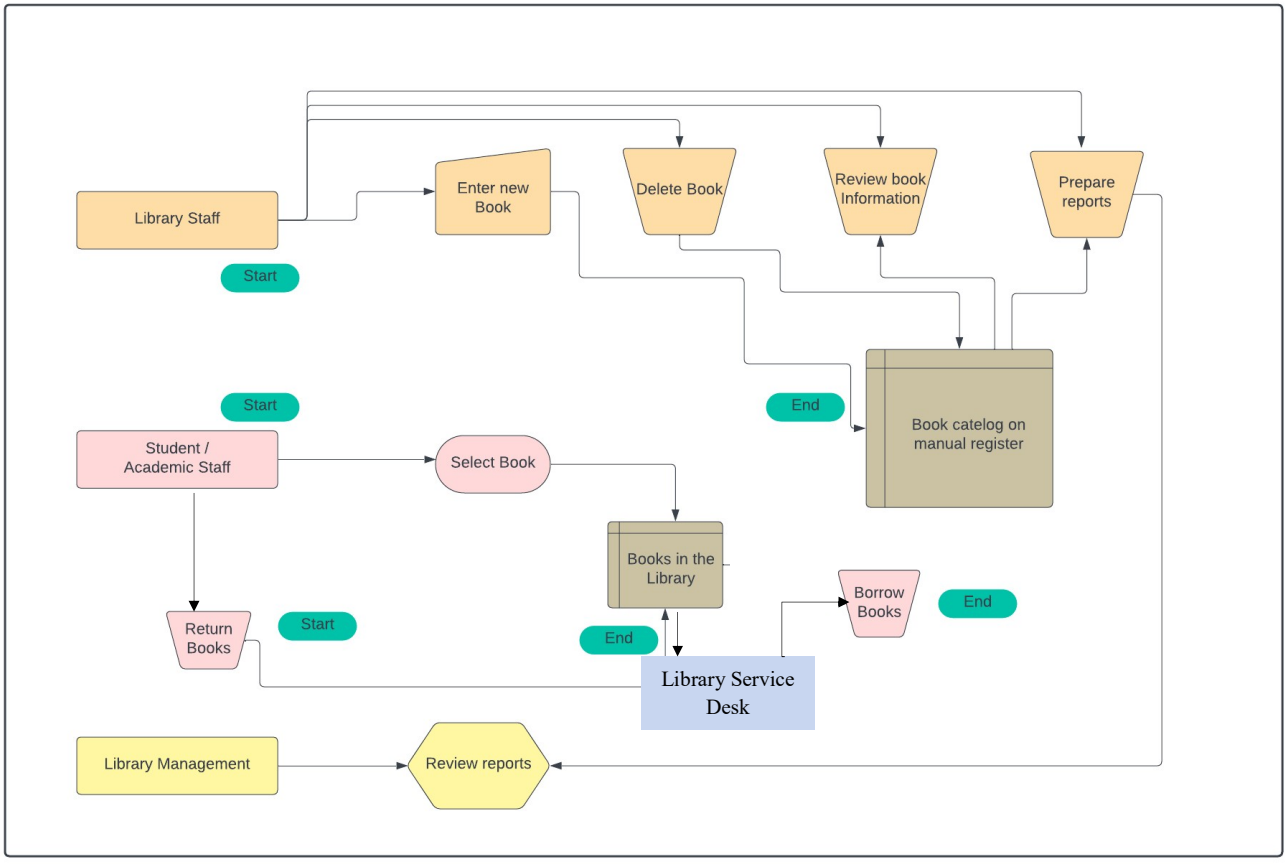
Library staff reaches out to student via email or phone, when there is an overdue item. This is handled case by case. This flow chart illustrates functions of the library as it is.

6. Proposed System

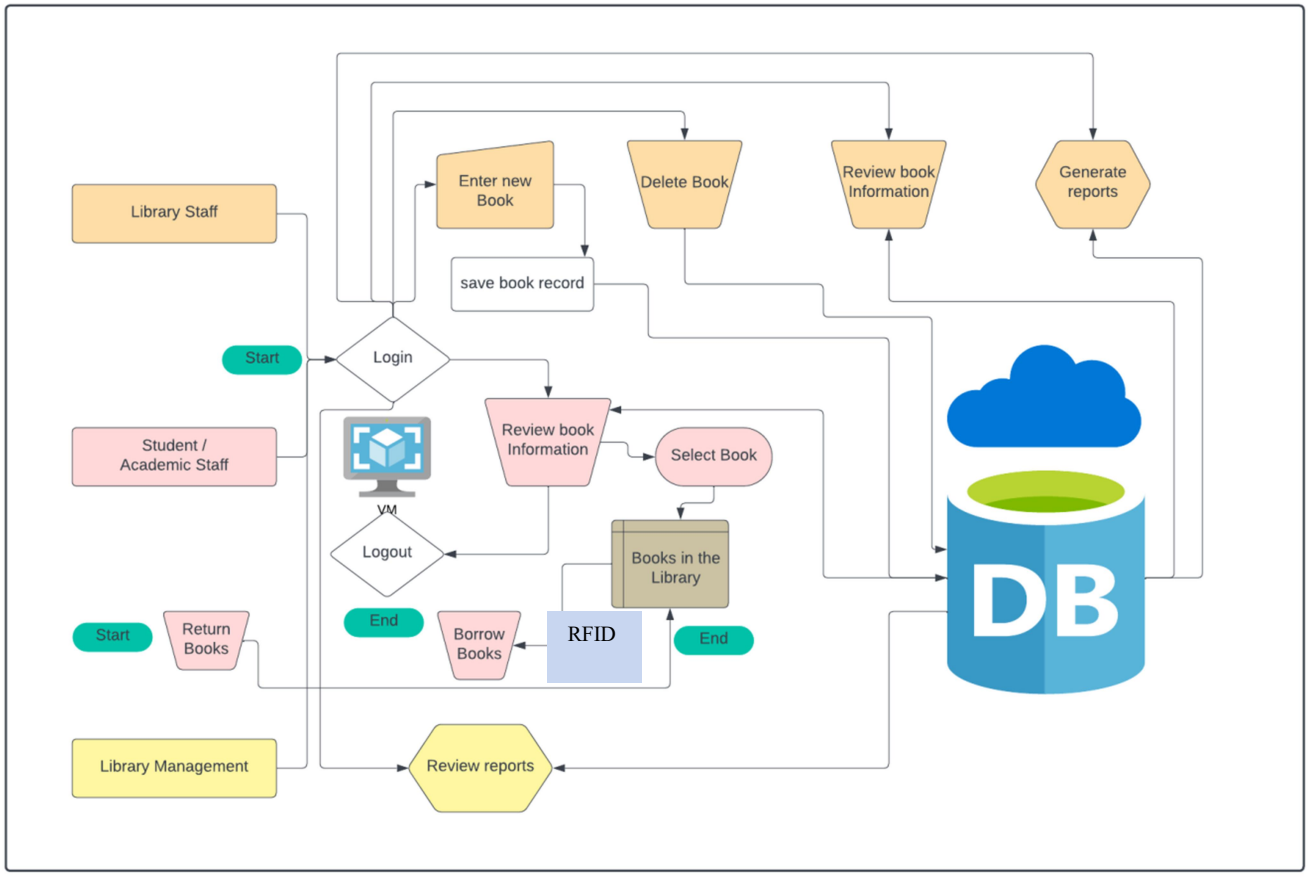
- User friendly interfaces via preferred access points (kiosk, desktop workstation, or mobile)
- Improved experience regarding time costs for accessing, using, managing and returning materials.
- Improved learning experience
- Improved educational opportunities associated with ease of use.
- 24/7 book dropping mechanism
- Automated emails sent to students

7. Flowchart for LMS

Process map as it is.

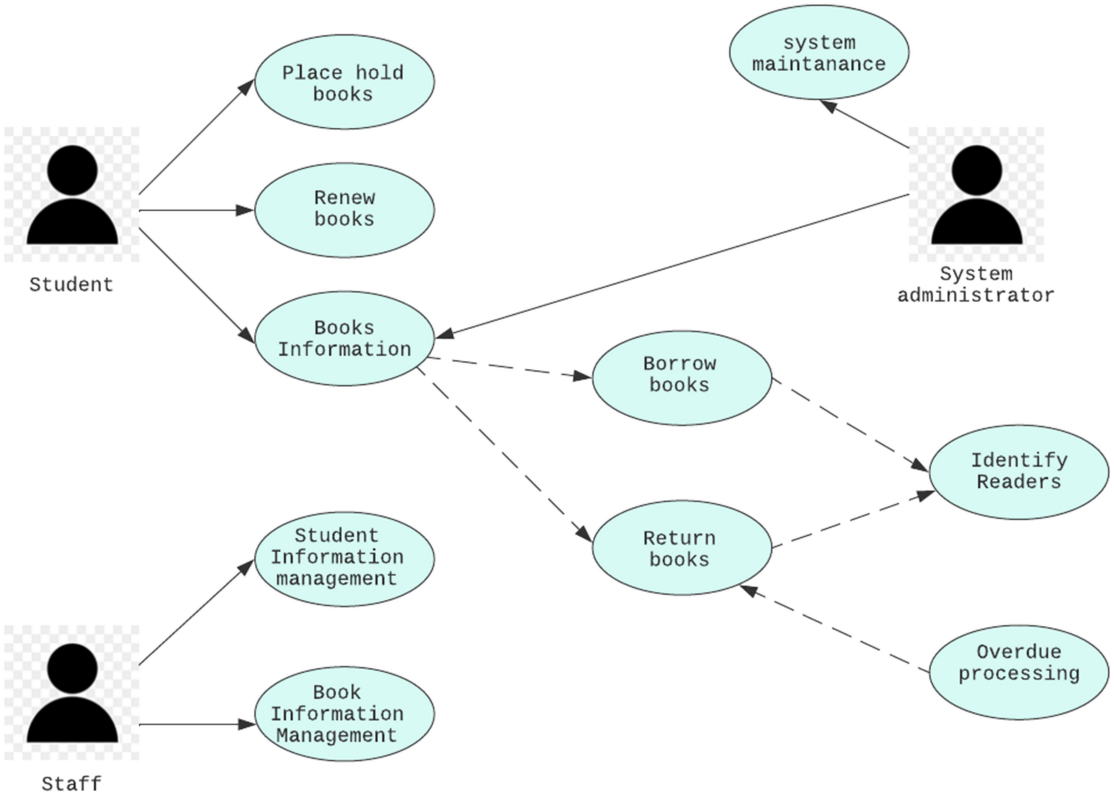


Process map LMS.

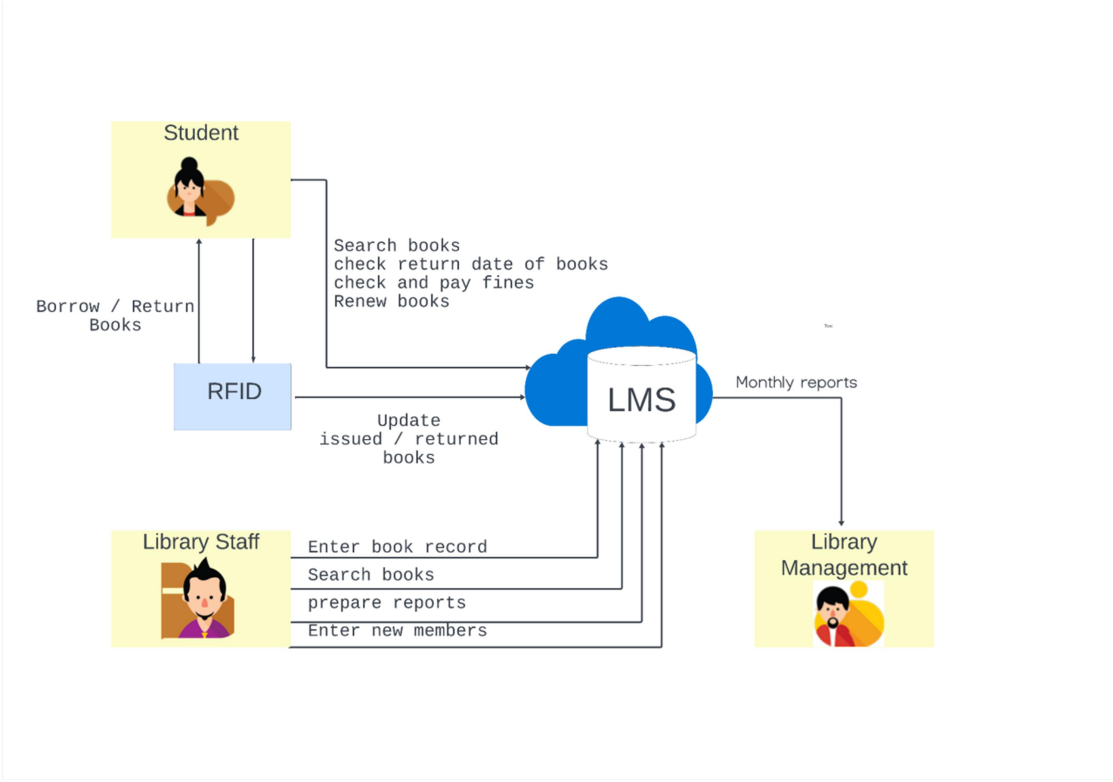


8. Scope using Use Case Diagram (UML)

UML: Unified Modelling Language



9. Data Flow Diagram



10. In Scope

- Login – The users of the system library employees, students and management will be able to login using their IDs & passwords.
- Creating record of books – The library employees will be able to add new books and other reading material in the library records.
- Modify Records – The library employees will be able to modify any item existing in the system
- Delete Books/records – The library employees will be able to delete any existing books under the selected category.
- Handle issue and return of books and other reading material
- Automated emails before the return date to the student
- Calculation of Fines by the system
- Automated drop box for books to be handled by the system.
- Fetching Reports – The management will be able to extract different types of reports based on the requirements specified.
- A log out feature will be added so that the employees, students and management using the system can log out once they are done with their work.

11. Out of Scope

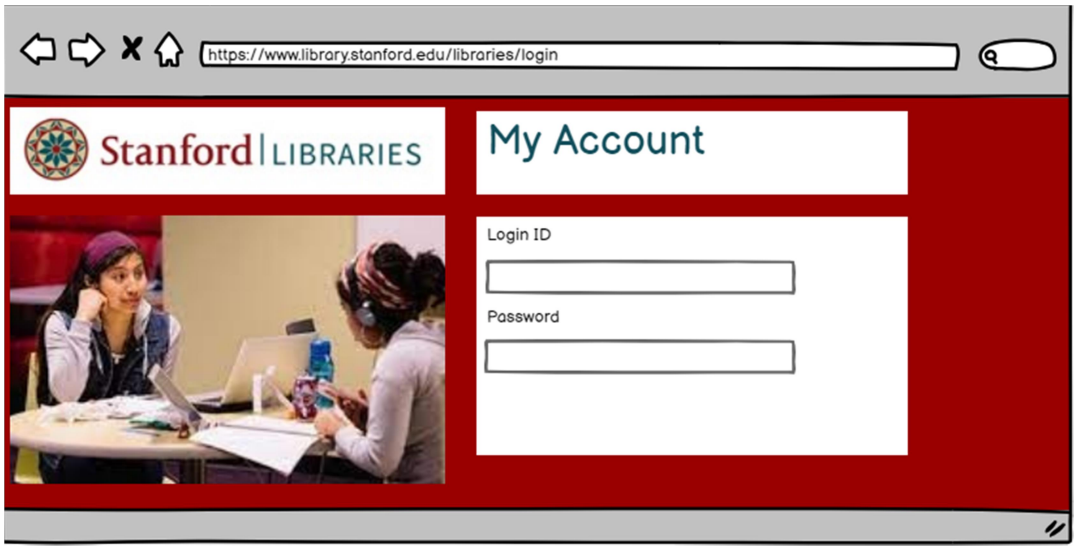
- This is handling the library of only one campus of Stanford University
- Any demand for training to new or existing user after two weeks.
- Any maintenance request after two months of system rollout.
- Any user outside of Stanford University

12. Wireframes:

Create sample wireframes for the system. Capture what screen will be show to the library employees to create records for each book and at what stage in the system.

The below screen will be shown to the library employees to create records for each book.

The below screen will be the view shown for login.



The below screen will be the view to enter book details by library staff.

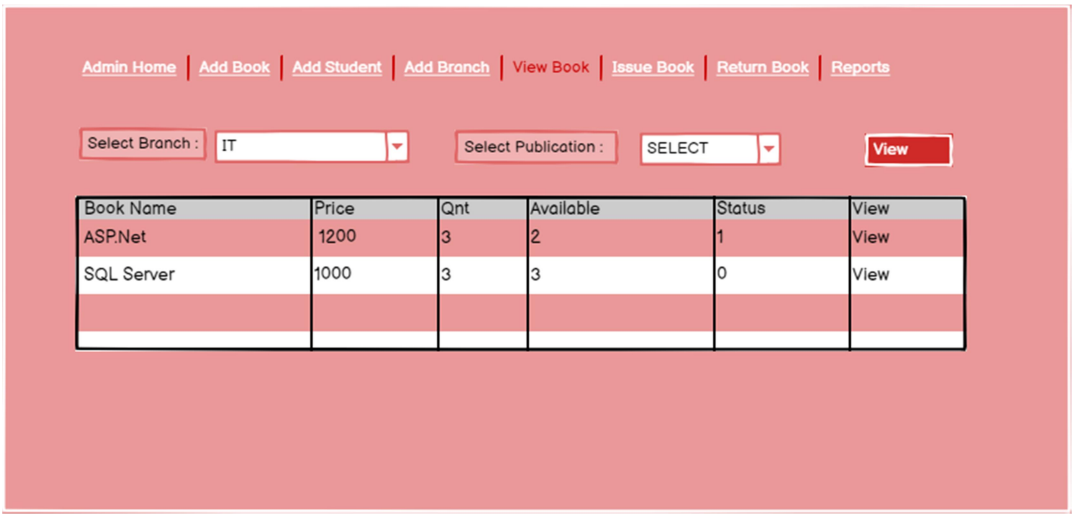
BOOK INFORMATION

Add a new book:

The book subject:	JAVA
The book title:	The Complete Reference
The name of the Author(s):	Kerty Syera
The name of the Publisher:	Com tech
Copyright for the book:	Author
The edition number:	8
The number of Pages:	504
ISBN for the book:	45622
The number of copies:	5
The name of the Library:	Public Library TVM
Shelf No	35

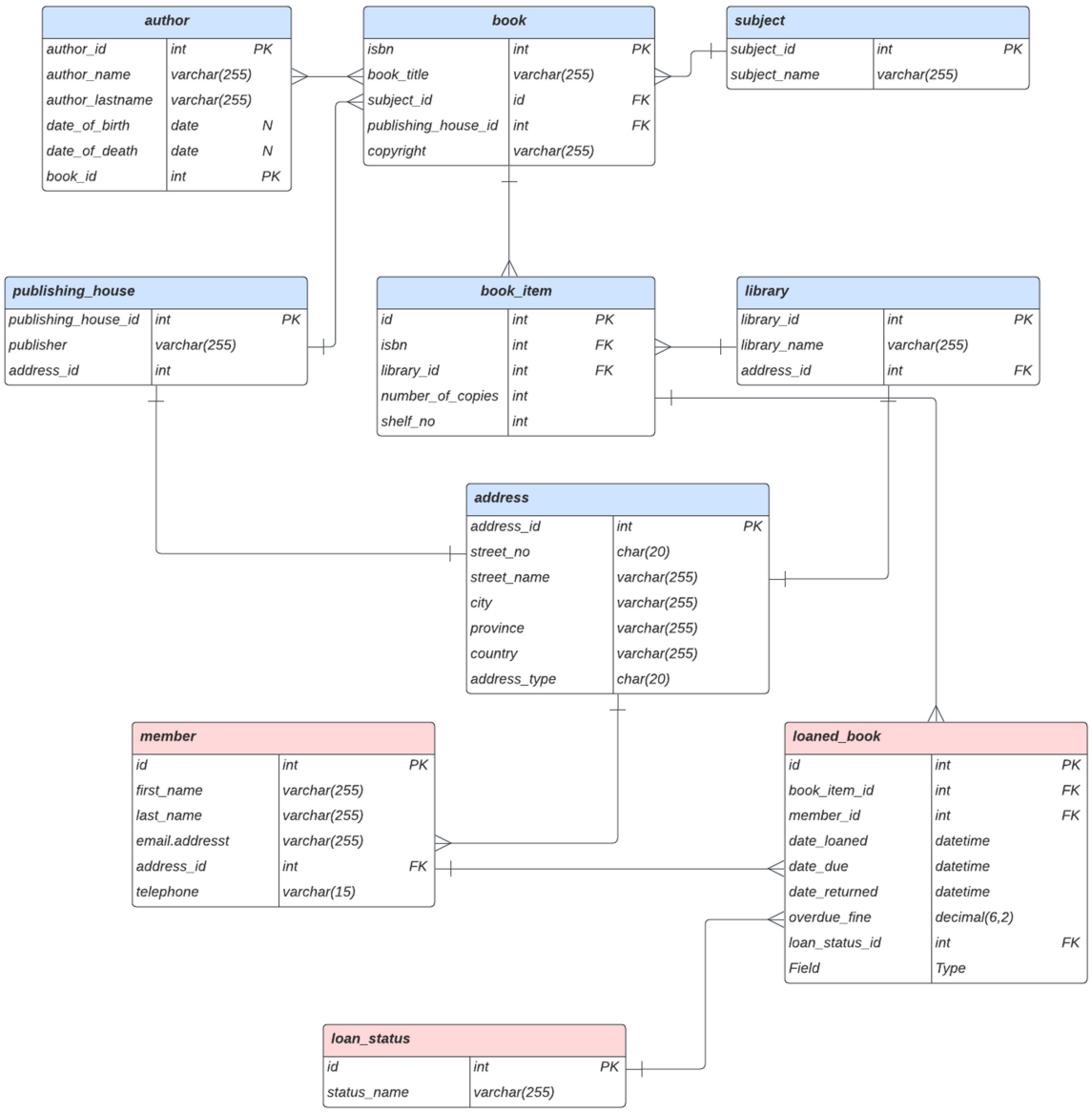
Insert the Information

The below screen will be the view shown for each book when searched by admin.



The below screen will be the reports shown for library management.

13. Entity Relationship (ER) Data Model



14. Functional Requirements

New LMS will serve following features.

1. The LMS should keep records of different categories of material available in the library like books, magazines, research papers, journals, and newspapers.
2. The books should be classified subject-wise in the software.
3. Each category like books, magazines, research papers, journals, and newspapers will have different issuing periods. For example, a book can be issued for 3 weeks but a magazine only for 1 week. Newspapers cannot be issued for use outside the library and so on.
4. Every reading material available shall have an RFID tag on it. The record of the same will be stored in the database. For each reading material record information like author, book name, publisher name, book edition, date and year of publication, cost of the book, and date of purchase of the book.
5. When a student wants reading material from the library, they will select the material and go to the checkout counter. The library staff will use an RFID reader to capture the details of the book. The student's name is tagged along with the book they borrowed. Problem Statement and Motivation
6. System will record the issue date and return date of the book.
7. System shall do an automatic calculation of fines in case of delayed return of books.
8. Library staff should be able to search for books on the LMS by search criteria like the name of the book or author.
9. Students should be able to access the library system online to know the return date. They should be able to access it via the web or mobile interface.
10. System shall send automated emails to the students 3 days before the return date to avoid the late return of books.
11. Access to free e-journals and e-books through the software.
12. Anti-theft detection: RFID readers are placed at the exit gate of the library and the RFID reader tracks books to a range of 2 meters and would trigger the alarm with a loud sound in case anyone tried to pass through the gate with an unissued book
13. Book drop box stations to be installed outside the library: Students can return books at any time in the RFID-enabled book drop box station. A student’s loan is immediately canceled once the student deposits the book in the drop box.
14. Management would like the following reports:
    - Which books are most rented?
    - Records of issued and unissued materials in the library (management will decide whether to stock them or not)
    - Amount of fine collected in a day, week, and month.
    - Number of lost books
    - Report on the total number of books, journals, etc.

- Age of books, that is, which books are more than 20 years old. College generally would prefer not to have very old books since new versions come up every few years

15. Non Functional Requirements

Write all the non-functional requirements for the system.

System Requirement:

- Data should be stored in cloud
- Highly secure, scalable, and reliable

Usability:

- Users will have an active internet connection

Environments

- LMS can be used by any windows or Mac run computers
- LMS can be used by any mobile phone

Appendix

I. Glossary

Abbreviation	Description
LMS	Library Management Software
Data Catalog	A data catalog is a detailed inventory of all data assets in an organization, designed to help data professionals quickly find the most appropriate data for any analytical or business purpose
BABOK	Business Analysis body of Knowledge
NCIP 2.0	International standard for webLIBRARIAN

II. References

Following sources were used in preparing this report.

- Stanford facts:

  https://facts.stanford.edu/wp-content/uploads/sites/20/2023/02/2023_Stanford_Facts.pdf

- BABOK guide:

  Once registered in the IIBA site, BABOK guide can be accessed here.

  https://www.iiba.org/knowledgehub/

- NISO Circulation Interchange Part1:Protocol(NCIP) version 2.02 –

  http://www.ncip.info/uploads/7/1/4/6/7146749/z39-83-1-2012_ncip.pdf

- Tools used for diagrams: Excel, Balsamiq, Lucid chart