Library Management System for Stanford

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Cohort 1

Stanford Library

STAKEHOLDERS

ACTOR	What he can do on the Software Created
Student	● The student will be able to find the book with one click. ● The issue/reissue of the book can be done quickly. ● Reduction/ Optimization of time. ● The students will be benefitted with immediate and accurate information regarding any book, magazine, or research paper. ● Reduction of efforts. ● Students will now have access to up-to-date information/records of books, magazine, or other available resources. ● Increases student engagement. ● The LMS offers the student ease of use – the student can select the book and go to the checkout counter. ● Students will be able to access the LMS via mobile or web interface – this will easily let them know the return date on login as well as a reminder will be sent 3 days before to prevent late return fee. ● Students will now have access to free e-journals and e-books. ● The return policy process is very convenient for students. They can now return the books at any time in the book drop box station. ● The student's loan will be immediately cancelled once the student deposits the book in the drop box.
Library Staff	● The staff can easily find the book with a single click. ● They can issue/ reissue books quickly. ● LMS manages the data efficiently. ● The staff will have access to immediate and accurate information regarding any type of book, magazine, or research paper. ● The staff can save a lot of time. ● The staff can now save a lot of efforts. ● They no longer will have to perform redundant tasks like calculating the late fee/fine. ● The staff can now generate various reports. ● Increases the productivity of staff. ● The library staff can now use a RFID reader to capture the details of the work – optimizing the time. ● The system will record the issue date and return date of the book. The staff need not do a manual entry. This reduces any human error. ● The system will do the automatic calculation of late fee. This prevents any human error and saves time for the library staff. ● The staff can easily search books by various search criteria such as name of the book or author.

Management	• Management will be able to generate various reports such as ▪ 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 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.
Developer	• Builds/develops the LMS with Java. • Performs Unit Testing, System Integration Testing of the LMS. • Handles production issues and fix bugs as reported by the tester. • Provides the design and builds the LMS. • Handles quality check and makes sure the portal aligns with the requirement document
Tester	• Tests the LMS using User Acceptance Testing (UAT) • Reports bugs to the developer

PROBLEM DEFINITION AND SOLUTION

The problem with the manual library management has adverse effects for both the students and the library staff. The process is very inefficient to manage as the university started to enrol more than 20,000 + students in a year and with the book count of 4 million.

Problems faced by students.

- Students do not have up to date information of the books, research papers, magazines, and other materials.
- Students waste a lot of time in unproductive activities to search a book and pick it up.
- The student engagement is very low due to the long tedious library process.
- Students could deposit books only in the library timings.

Problems faced by library staff.

- The process of maintaining, organizing, and handling books was a tedious task for the staff.
- The data could not be efficiently managed.
- A lot of time and efforts were wasted by the staff.
- The number of staff needed to manage the library was high.
- The fine/late fee calculation was tedious and a time – consuming affair.
- No Reports could be generated on books issued due to the manual system.
- It is difficult to manage 4 million books with less staff and performing redundant work.

Advantages of LMS

Advantages of Library Management System:

For Students

- Improves student engagement in the library.
- Optimization of time and effort for the students.
- Students can now deposit the books at any time.

For Library staff

- Reduces overheads and increase productivity of library staff.
- Cost reduction
- Up-to-date records of all books, research papers, magazines, and other materials available in the library.
- It will generate dynamic reports for better decision-making.
- Optimization of time and effort for the staff.
- Reduction in the count of library staff
- Automation of activities prevent the staff from performing redundant activities.
- Easy calculation of late fee/fine.
- Generate various reports.
- Management of the books now becomes an easy process.
- Automated email reminders are sent to students to return the book.
- Creation and generation of dynamic reports for better decision making.

EXISTING SYSTEM

- How is the existing system? Does it have any of the mentioned features already?

  The present/existing process of the library management is a manual, inefficient and tedious process. The following activities are performed.

  - It is manual process. Paper based as journal entry or ledger entry.
  - Books Issue
  - Book Return
  - Late fee/fine calculation
  - Report generation
  - Searching a book, journal, or research material.
  - Management of the books
  - Fetching books based on various search criteria such as subject, author, tags.

  The process mentioned above will remain the same however we will automate the process.

PROPOSED SYSTEM

What is the proposed solution or system? Mention in points how the system itself will be for the user. (Sample points given, you can add more to it)

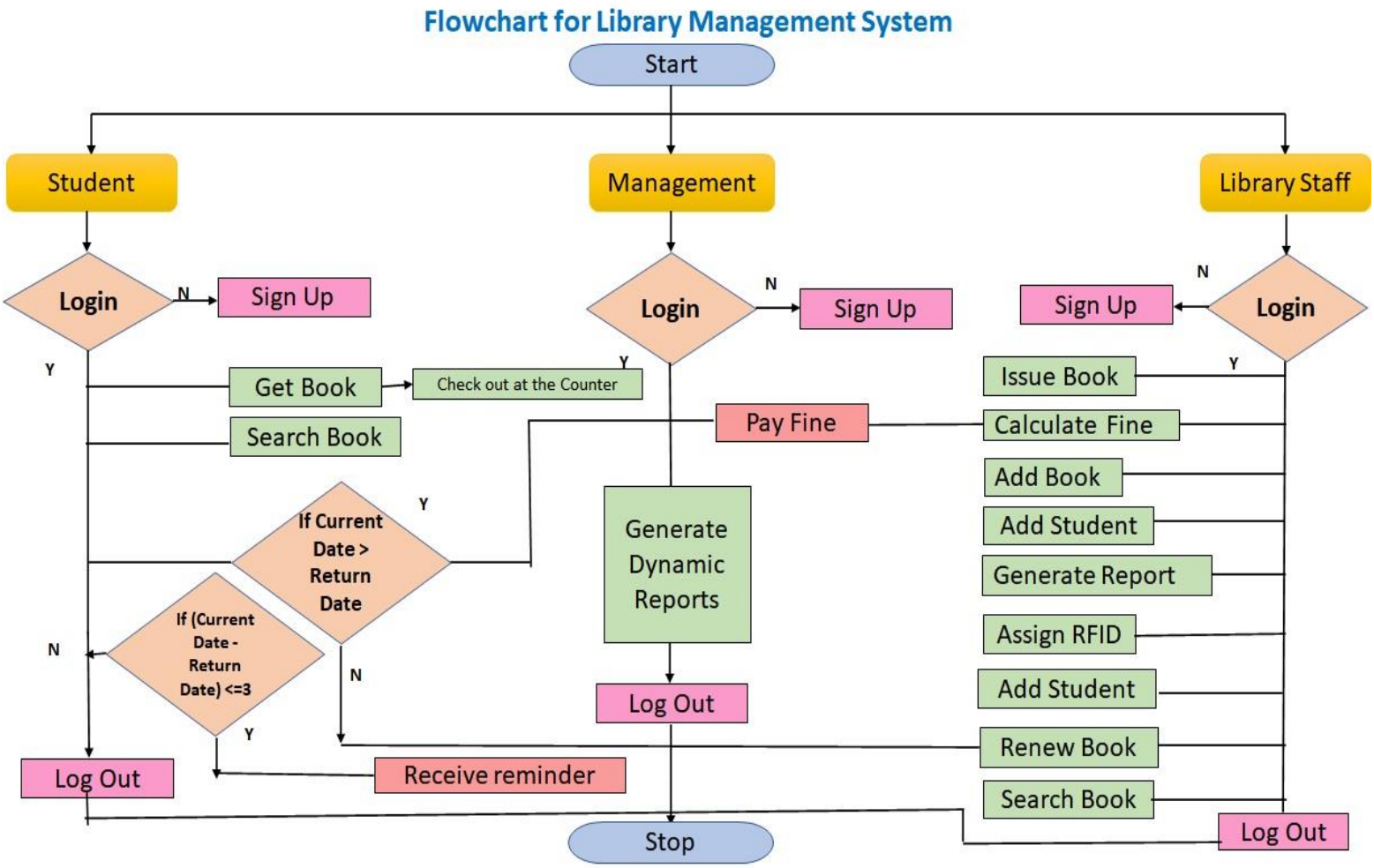
- User friendly interface
- Ease of use and management
    - The staff can search a book or filter it out based on various criteria such as Author, date of the publication, title, or subject type.
    - It reduces the count of the staff and work.
    - All the books have RFID, so it is easy to find the most sought out/least sought books. The number of books older than 20 years can also be filtered.
    - Reduces overheads and increase productivity of library staff.
    - Cost reduction
    - Up-to-date records of all books, research papers, magazines, and other materials available in the library.
    - It will generate dynamic reports for better decision-making.
    - Optimization of time and effort for the staff.
    - Reduction in the count of library staff

- Automated work
    - The late fee/fine calculation is tedious and is prone to human error. However, the LMS calculated the fine based on the book issue date and the return date.
    - The library staff need not do any redundant work such as manual entry on the ledger/journal.
    - Automated email reminders are sent to students to return the book.
    - Creation and generation of dynamic reports for better decision making.

- Improved Student Engagement
    - Improves student engagement in the library.
    - Optimization of time and effort for the students.
    - Students can now deposit the books at any time.
    - The LMS offers the student ease of use – the student can select the book and go to the checkout counter.
    - Students will be able to access the LMS via mobile or web interface – they will easily know the return date on login as well as a reminder will be sent 3 days before to prevent late return fee.
    - Students will now have access to free e-journals and e-books.
    - The return policy process is very convenient for students. They can now return the books at any time in the book drop box station.
    - The student's loan will be immediately cancelled once the student deposits the book in the drop box.

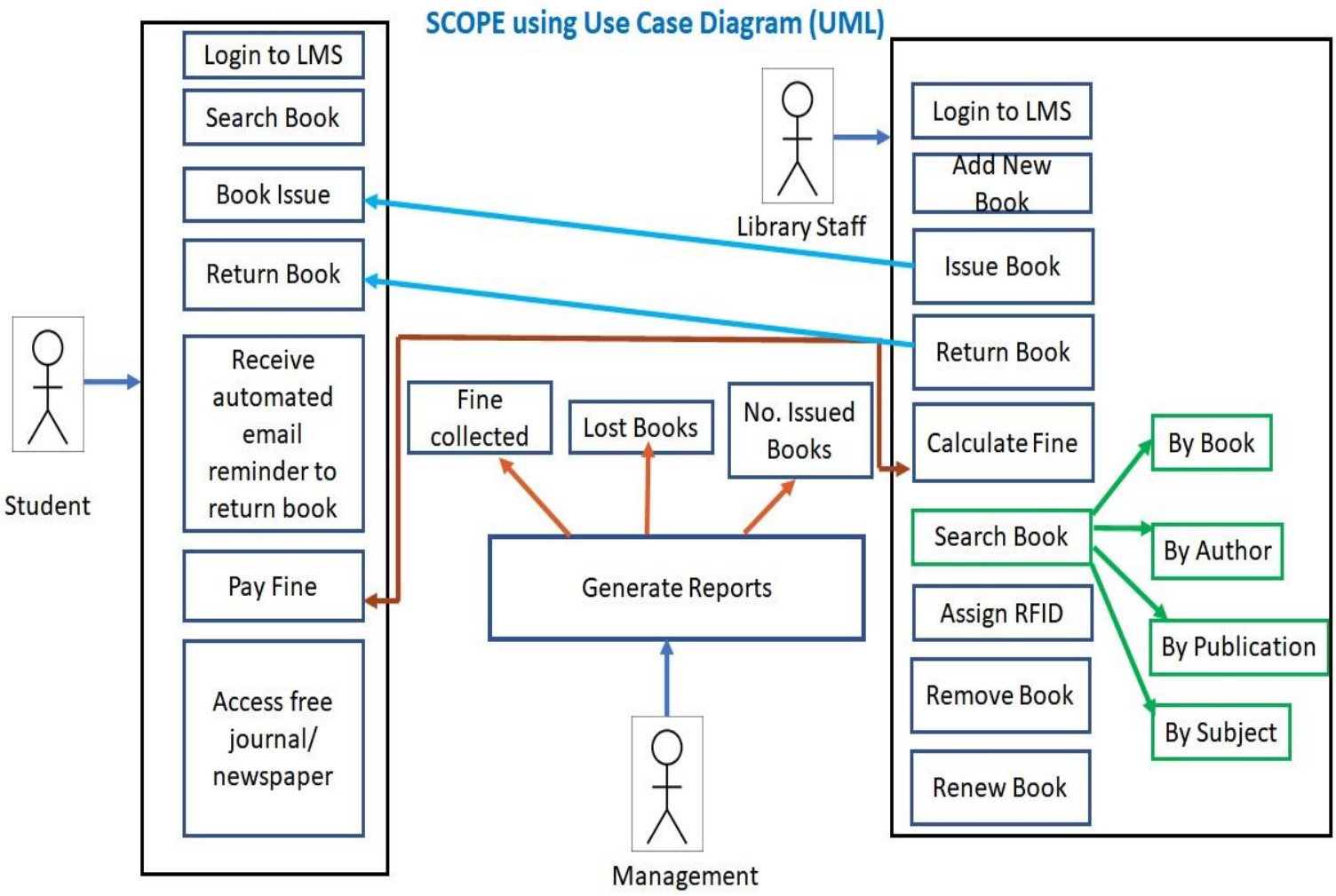
Flowchart for LMS

Create and provide a flow chart for the system.



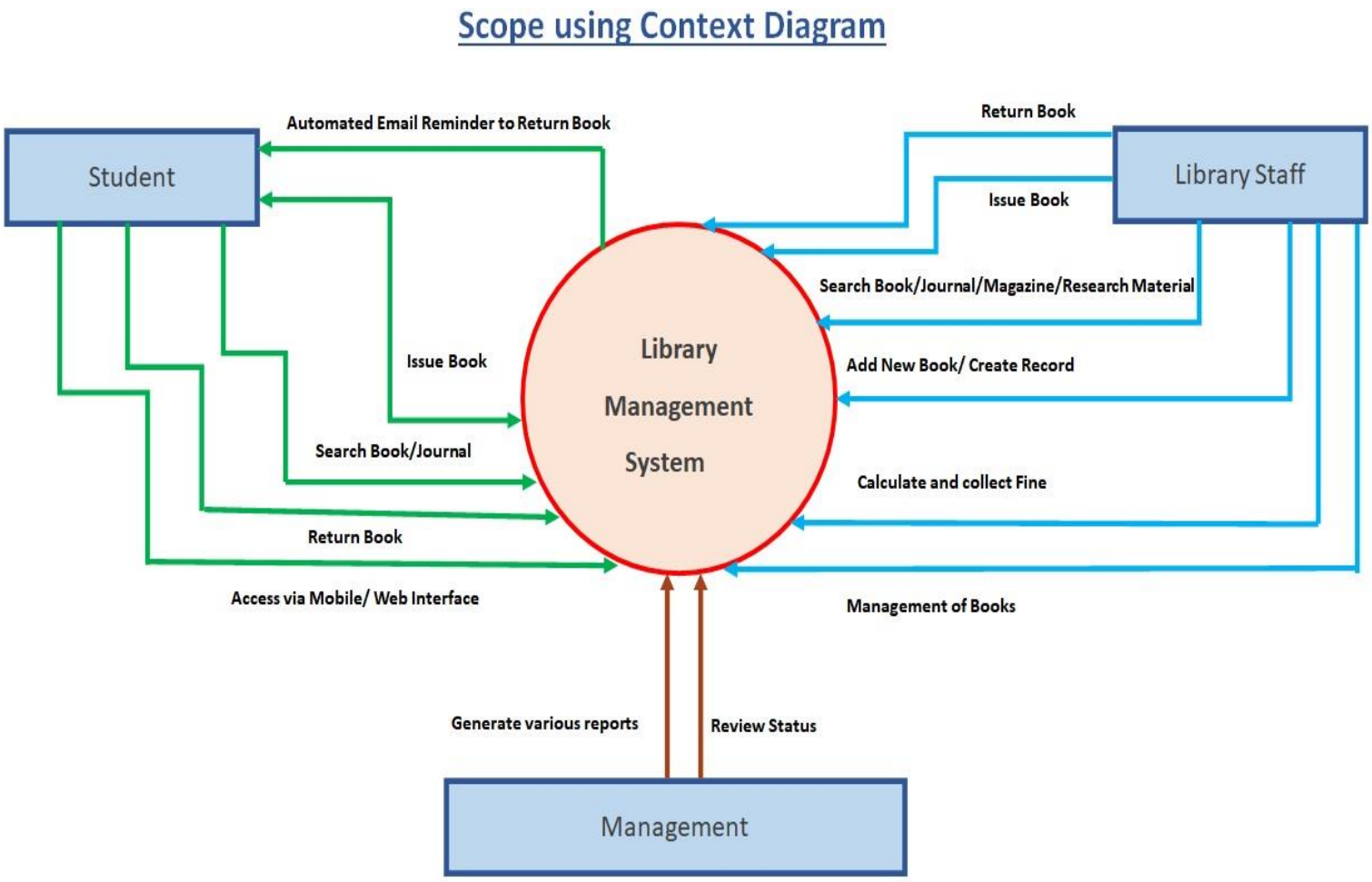
SCOPE using Use Case Diagram (UML)

Create a use case diagram including all the actors and processes for an end to end process of the system.



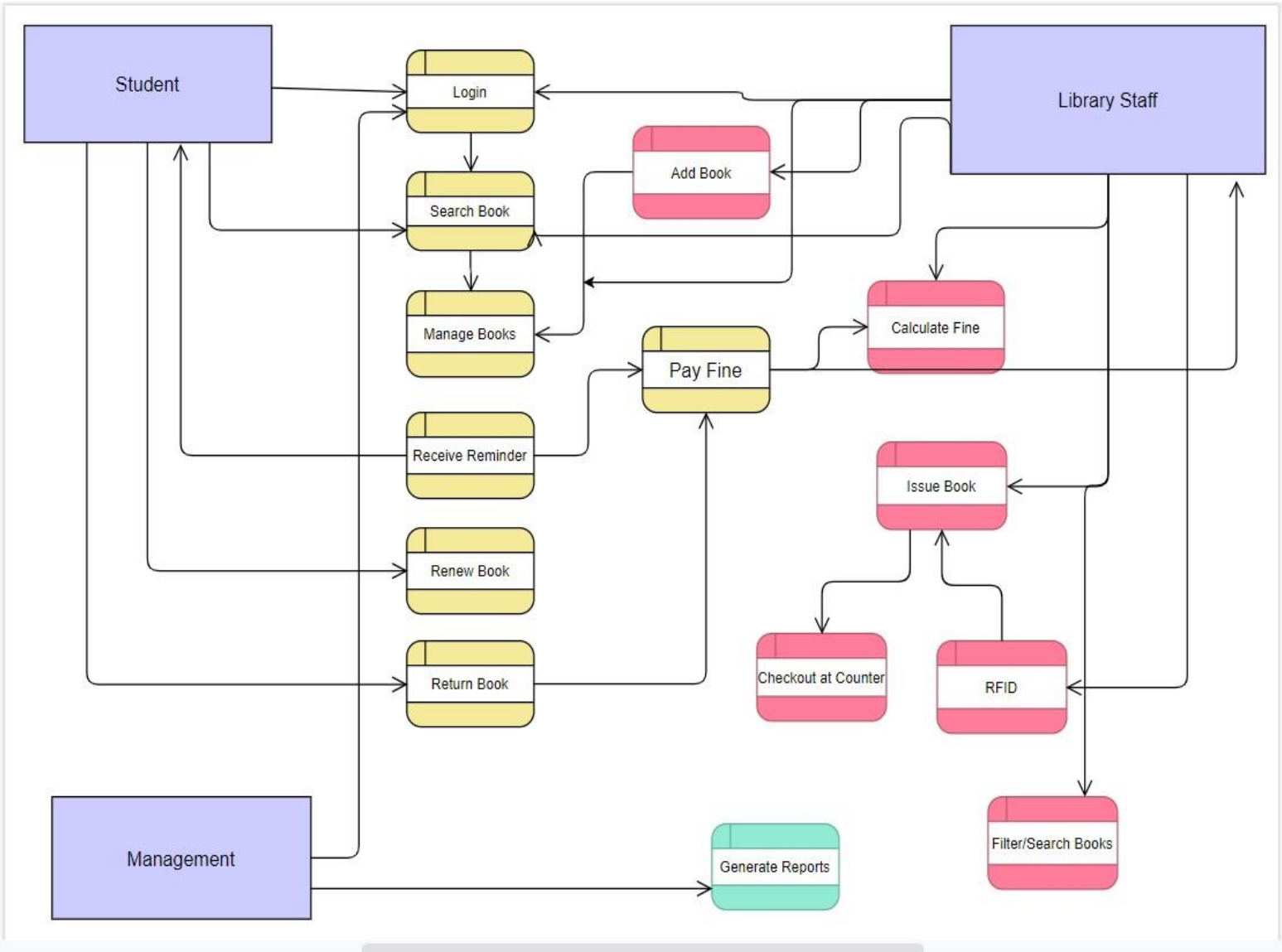
SCOPE using Context Diagram.

Depict the scope using Context diagram.



DATA FLOW DIAGRAM

Create a data flow diagram.



IN SCOPE

- Create different users such as Students, Library staff, management and assign roles and create permission for specified tasks.
- Authenticate the user's login credentials.
- They can view, search, and select the books.
- The users can maintain their profile and change password if needed.
- Dynamic reports can be generated based on different search criteria.
- Automation of processes such as calculated of late fee based on book issue date and book return date will be done. The students will also receive email reminders to return the book.
- It is easy to fetch a book based on various search criteria such as Author, Title, date of publication, subject etc.
- Anti-theft detection: RFID readers will be 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.
- Book drop box stations will be installed outside the library: Students can return books at any time in the RFID enabled book drop box station. Student's loan is immediately cancelled once the student deposits the book in the drop box.
- Ease of use and management
    - The staff can search a book or filter it out based on various criteria such as Author, date of the publication, title, or subject type.
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- The return policy process is very convenient for students. They can now return the books at any time in the book drop box station.
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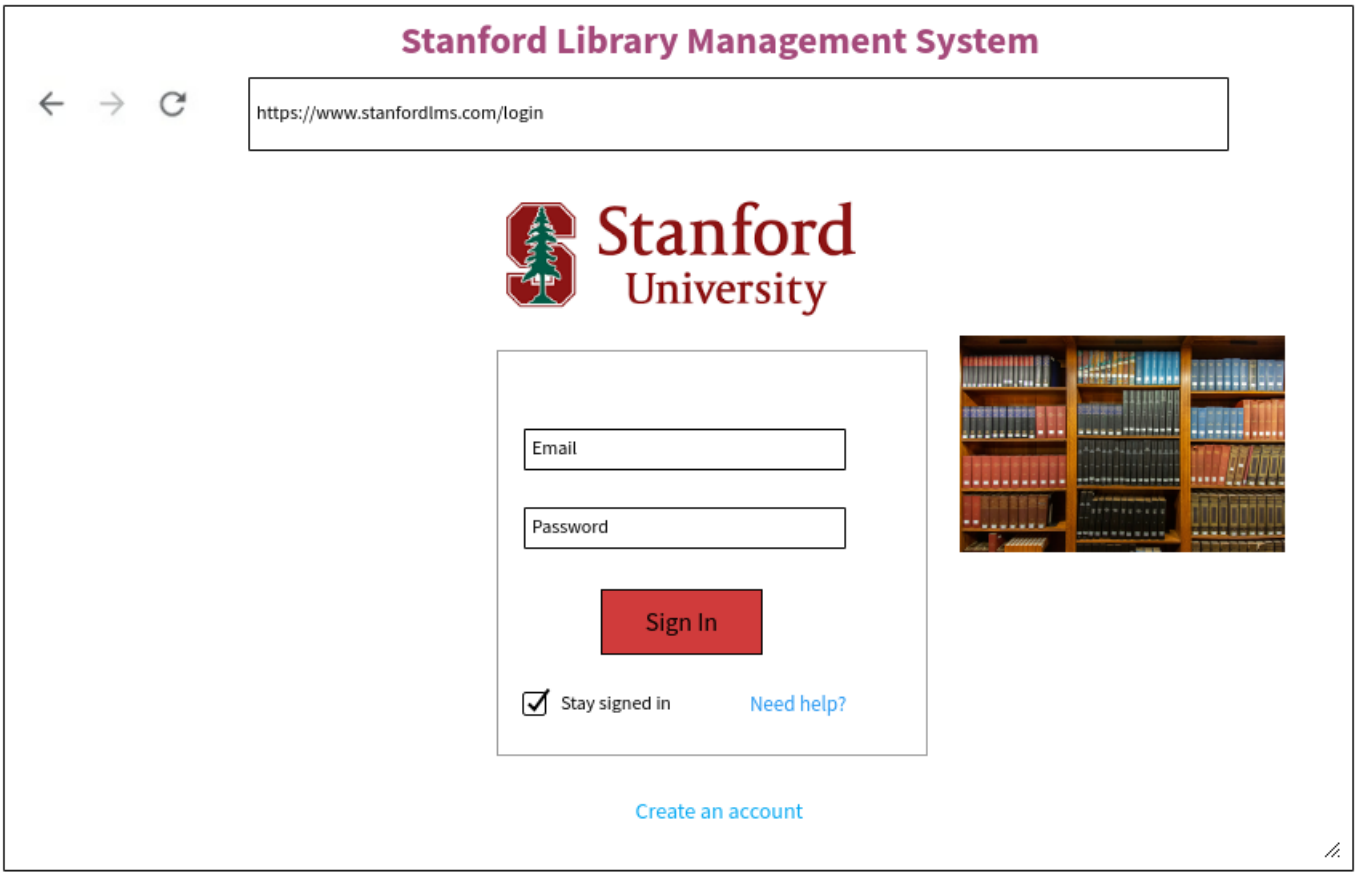
OUT OF SCOPE

- The book return policy must be physically done – The students currently must drop it at the drop box station. The options to send it via mail service would save time for the students.
- More information in the LMS can be provide- the placement of the book such as Aisle number, row and column of the book will give much easy access to fetch the book.
- The process of renewal of a book need not require physical visit into the library. An option could be provided to do it online.
- Online payment of the fine.

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.

Stanford LMS Login Screen



Stanford LMS – Add New Book Page

Stanford Library Management System

https://www.stanfordlms.com/addbook.com

Home | Add New Book | Issue Book | Return Book | Calculate Fine | Help

Stanford University

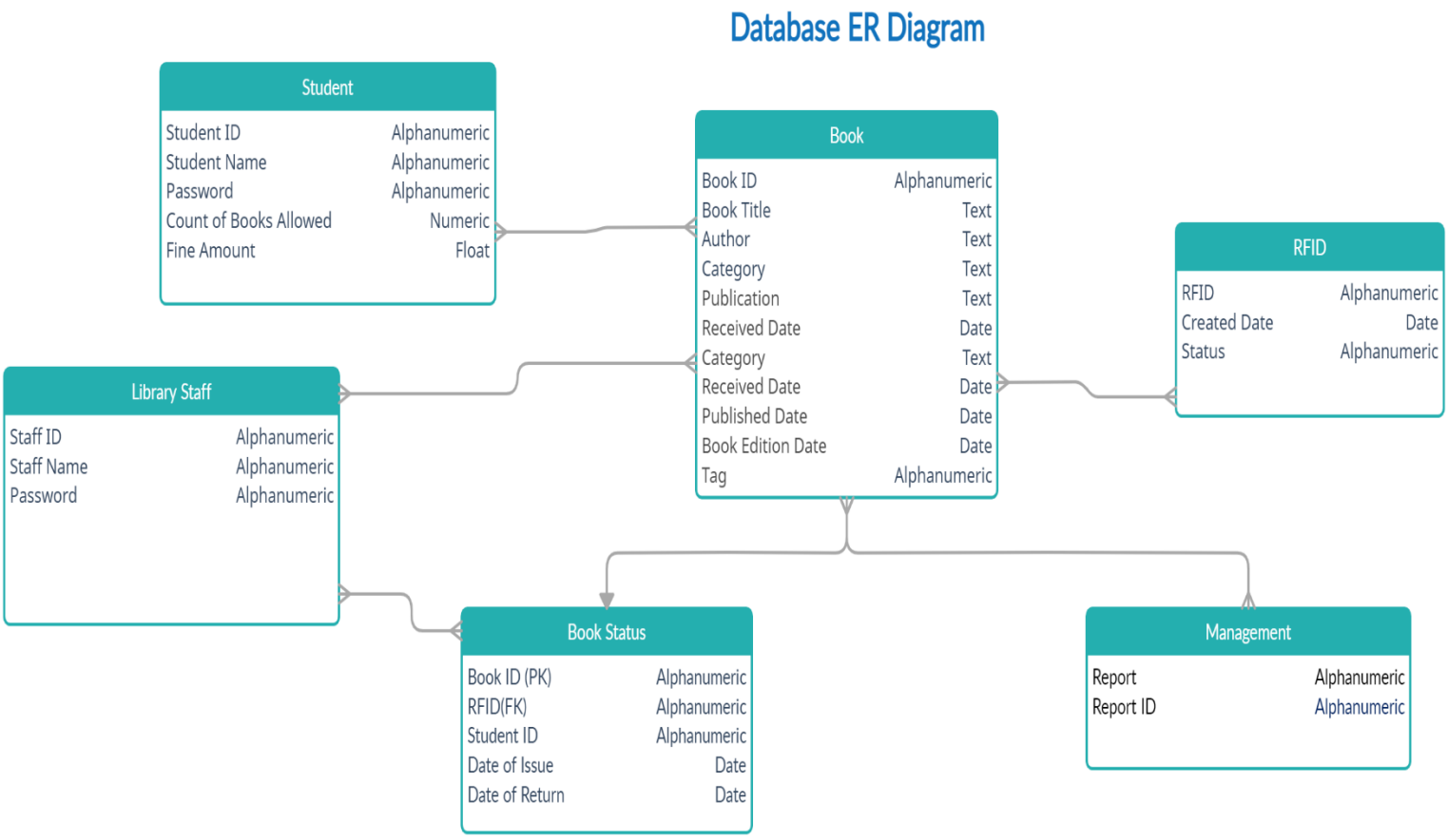
Book Title	Enter Title of the Book/Journal/Magazine/Research Paper
Author Name	Enter Author's Name
Subject category	Choose a Category
Publication	Enter Publication's Name
Received Date	10 March 2021
Publication Date	16 March 1995
Book Edition Date	23 September 1987
RFID #	12-AC-12-TH
Tags	☑ Book ☐ Journal ☐ Magazine ☐ Research Paper
Price	Enter Price of the Book

Reset Save Submit

Search a book

ER DIAGRAM FOR THE SOFTWARE

Create an ER Diagram for the system you have designed.



FUNCTIONAL REQUIREMENTS

Write down all the functional requirements for the system in a list format.

- Create different users such as Students, Library staff, management and assign roles and create permission for specified tasks.
- Authenticate the user's login credentials.
- They can view, search, and select the books.
- The users can maintain their profile and change password if needed.
- Dynamic reports can be generated based on different search criteria.
- Automation of processes such as calculation of late fee based on book issue date and book return date will be done. The students will also receive email reminders to return the book.

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- Book drop box stations will be installed outside the library: Students can return books at any time in the RFID enabled book drop box station. Student's loan is immediately cancelled once the student deposits the book in the drop box.

NON-FUNCTIONAL REQUIREMENTS

Write all the non-functional requirements for the system.

System Requirement:

- LMS can be used on any Windows and MacOS run computers.
- Users will need an active internet connection.
- It will be RFID ready (NCIP 2.0 HTTP server available)
- Auto scheduled tasks like emails and database maintenance
- Data should be stored in cloud.
- Highly secure, scalable, and reliable

Usability:

- The screens should be self-explanatory and very user friendly.

Environments

- We will be creating and maintaining the program in Java.
- We chose Java because it will not change much over time.
- It will require very little maintenance to be done on the code.