CMSC 495 6380 PROJECT ANALYSIS

GROUP 7

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REVISION HISTORY TABLE

DATE	NAME	DESCRIPTION
06/26/2022	Franklin Pokam	Project Review
06/07/2022	Ayodeji Onitilo	Cover page and project analysis review
06/07/2022	Arnaud Tako	Inner Working details, General Zero Level DFD
06/12/2022	Ayodeji Onitilo	Data sources, context diagram, user and subsystem interactions
06/26/2022	Franklin Pokam	Background of the project, Input data and sources, Output data and destinations, Converting input data to output data, Context diagram, Description of subsystems, Mapping out Subsystems and requirements
07/02/2022	Ayodeji Onitilo	Final revisions to input and output data sources, modifying context diagram

Background of The Project

A library Management System is a small to medium size application that helps manage a library. Librarians are the ones who are heavily involved with the managing side of the application. They manage the library using a computerized management system. The main tasks that librarians are able to perform using the system include issuing books to students, returning books from students, adding books to the library database, and adding new students to the library database system. Librarians can also record these transactions on the backend.

The system also keeps track of the students who use the library, and it provides book details. THis system will minimize loss and maximize profit by keeping track of every transaction between a librarian, a student, and books.

Input Data and Sources

Input data are credentials for authentication and queries. Inputting data is getting data from the users to the computer. The input data sources are the librarians and the students. Input data for the project will be stored in a CSV file from which all the data will be parsed.

- Input data is used to make the librarian work very easy, and very logical.
- Data entry uses the processor that accepts commands and data from the operator through a keyboard.
- The sources of the input data for this project are students and librarians/staff, because they're the ones entering the information in the system.
- The system collects input data from the users using a GUI, which stands for graphical User Interface.
- The input data collected is then processed and stored in the database.
- A librarian/staff (admin) has some privileges that allow him/her to raccess, modify, and delete user and book's data.
- The input data of books are from cataloguing. That data is obtained from a user through a GUI. The data are book details, which include title, author, publisher, year published, and RFID.
- The user's input data includes first and last name, student ID, email, and grade year. It can also include the date and time a book was borrowed.

Output Data and Destination

Output data is simply the information displayed when a user inquires about a book. The destinations data are the monitor to display the information to the users, and the printer to print book details and return date for the borrowers.

- Output data are responses for queries.
- Outputting data is information for the users.
- Output data will be used to communicate the results of command processings to Librarians and students.
- Output data is necessary for the acquisition of a book by a student or staff.
- Librarians have privileges that allow them to modify these details.
- The output data include the date and time the borrower must return the book, a history list of books the borrower has borrowed, a penalty flag if applicable, current availability of the book, and some book details such as titles and authors.

Converting Input Data to Output Data

An input device (Keyboard, mouse, scanner, barcode scanner) collects and sends information to the library management system processing, and an output device (monitor, printer) displays the results of the process. Input devices (mouse, keyboard, scanner, barcode scanner) only allow for input of data to a computer and output devices (monitor, printer) only receive the output of data from another device.

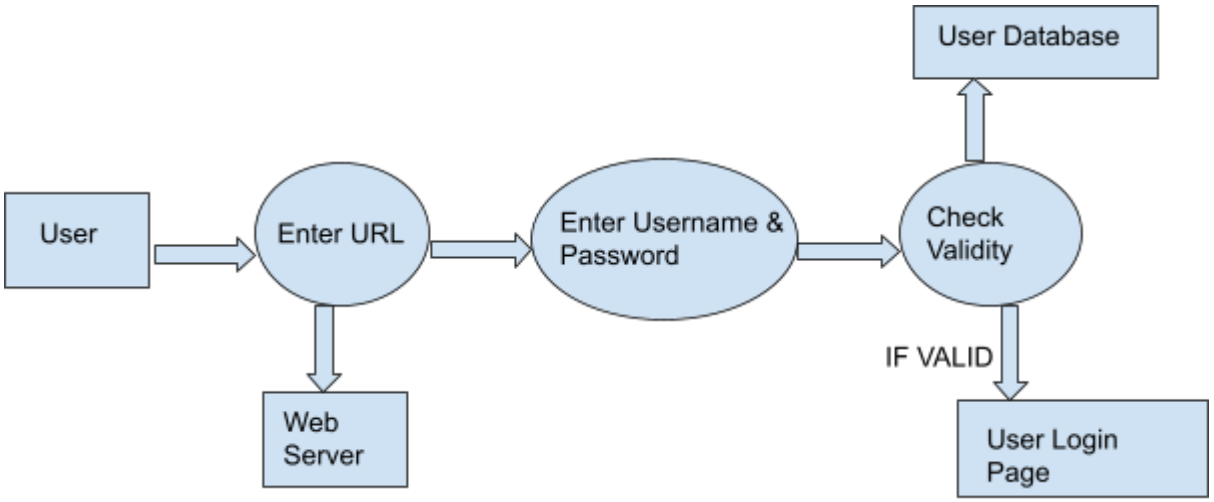
When a user successfully logs into the system and inputs the information for the book the user is looking for, the system searches through the book data to provide the book availability. The user requests to check out the book and a transaction is created and the new book details are updated in the system.

The processing steps to convert input data into output data are as follow:

- Data Recording
- Data Transcription
- Data Conversion
- Data Verification
- Data Control
- Data Transmission
- Data Correction
- Data Display

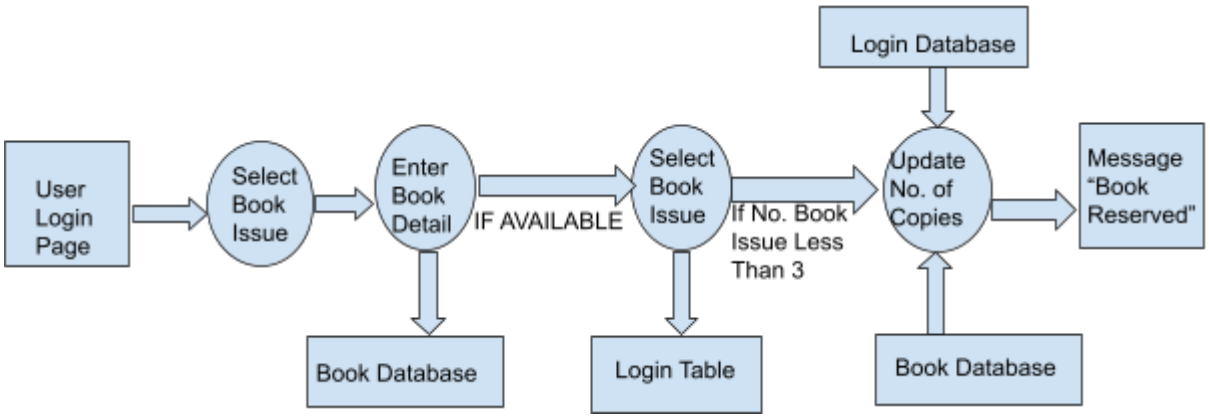
USER LOGIN

This feature is used by the users to login into the system: username and password required. After GETTINGg to the homepage of the website , the user shall login by entering his/her credentials in the GUI box displayed on the screen. If he/she is a valid user the login page will be displayed



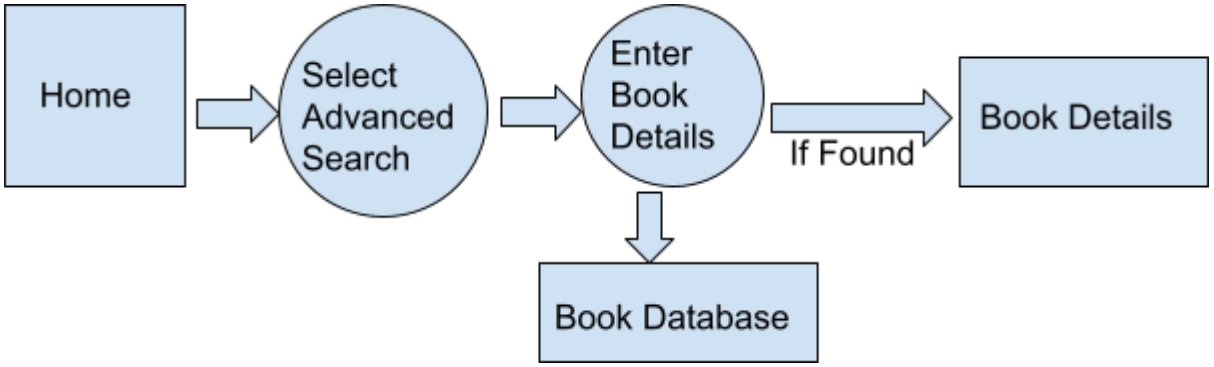
BOOK ISSUE AND RETURN BOOK

After entering the user LOGIN page the user shall select book issue, enter the book detail. The user shall now select the book issue. If the maximum number of books issued limit has been reached, then someone with higher privileges can approve the book issue.



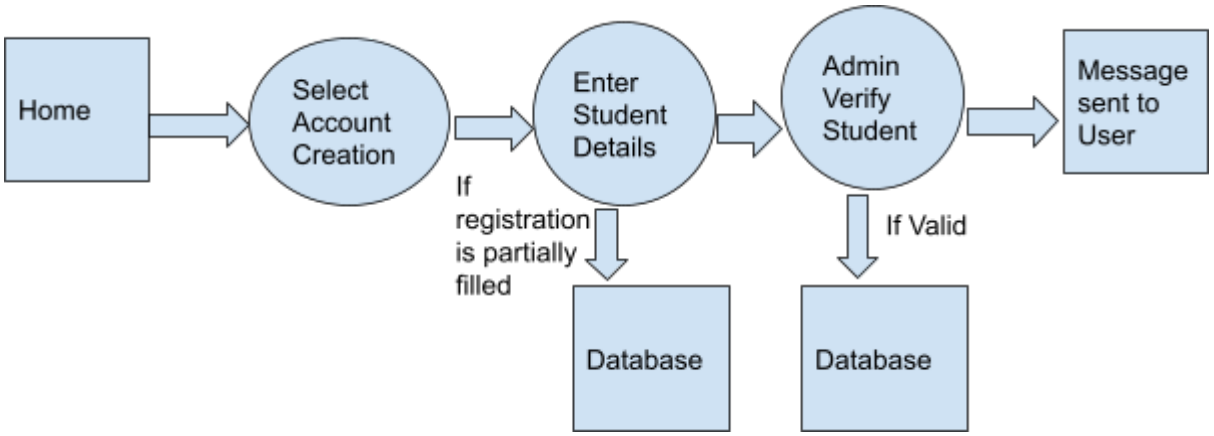
SEARCH BOOK

The home page login should provide a button for the book search book search. The user shall use the GUI box to enter the book details. The book details are displayed as a result of the search.



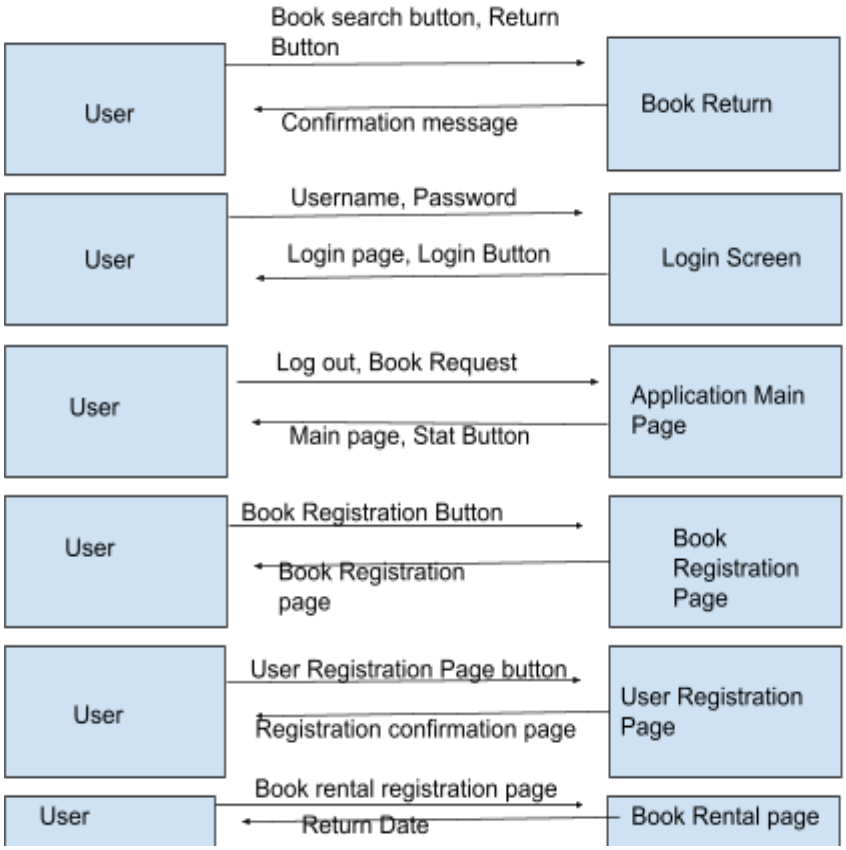
REGISTRATION

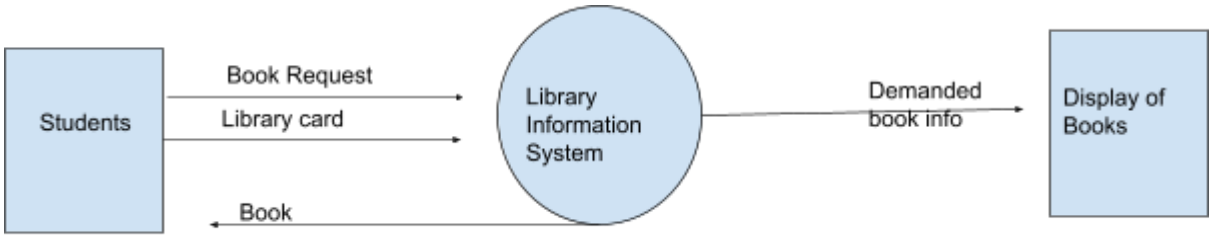
The user shall be able to create and account, which will require him/her to enter student detail, or staff details. If all the overcrowded, a librarian with higher privileges shall approve the registration. A message is sent to user after it is complete.



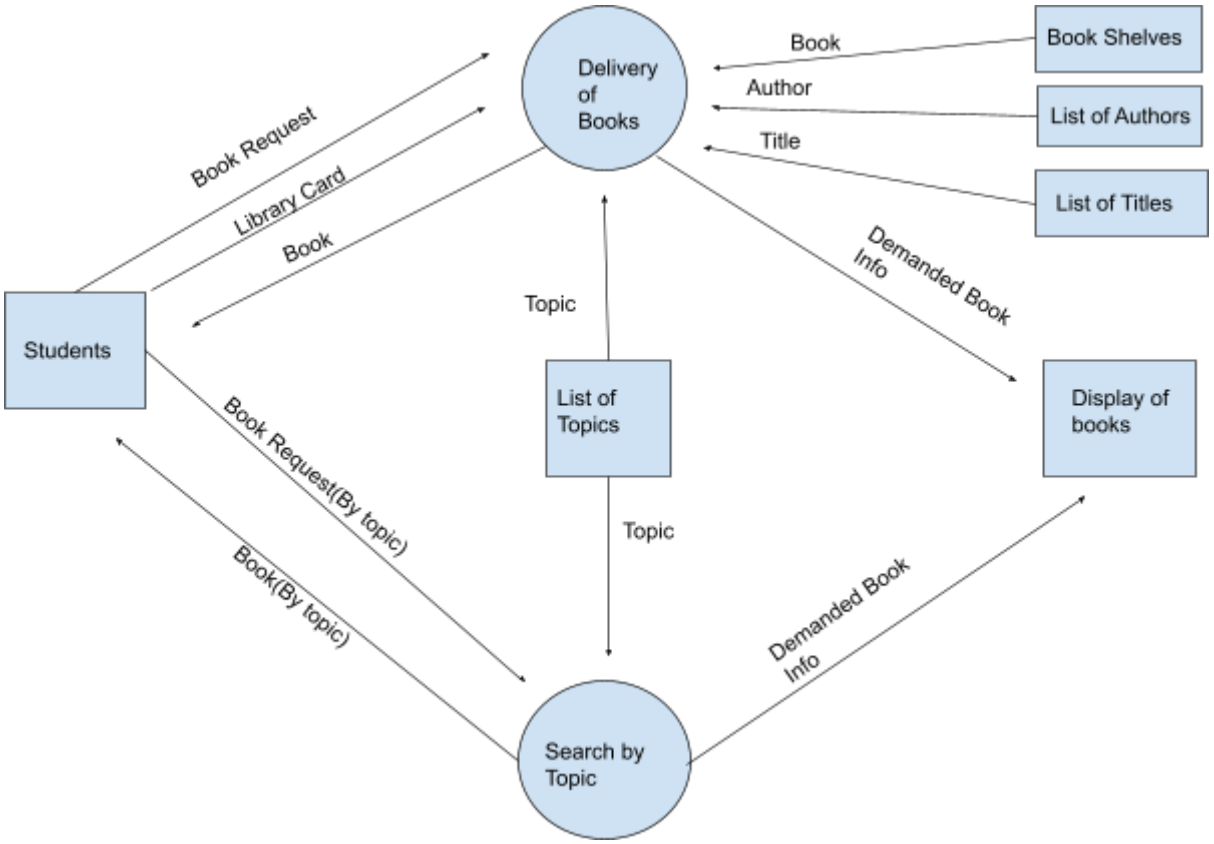
Context Diagrams

Tier 1





Tier 2


Delivery of Books
Book
Book Shelves
Author
List of Authors
Title
List of Titles
Book Request
Library Card
Book
Demanded Book Info
Topic
Students
List of Topics
Display of books
Book Request(By topic)
Topic
Book(By topic)
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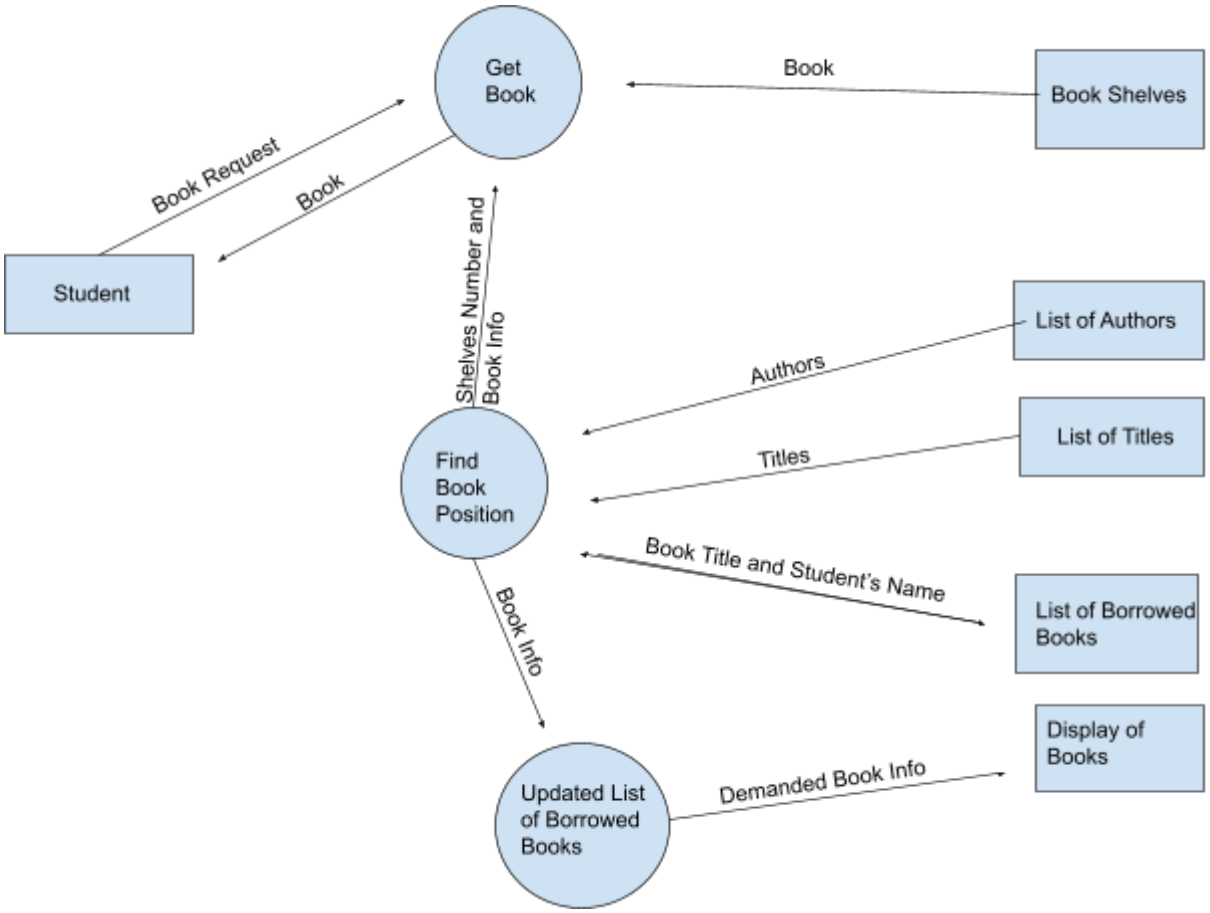
Search by Topic

Tier 3


Get Book
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Find Book Position
List of Titles
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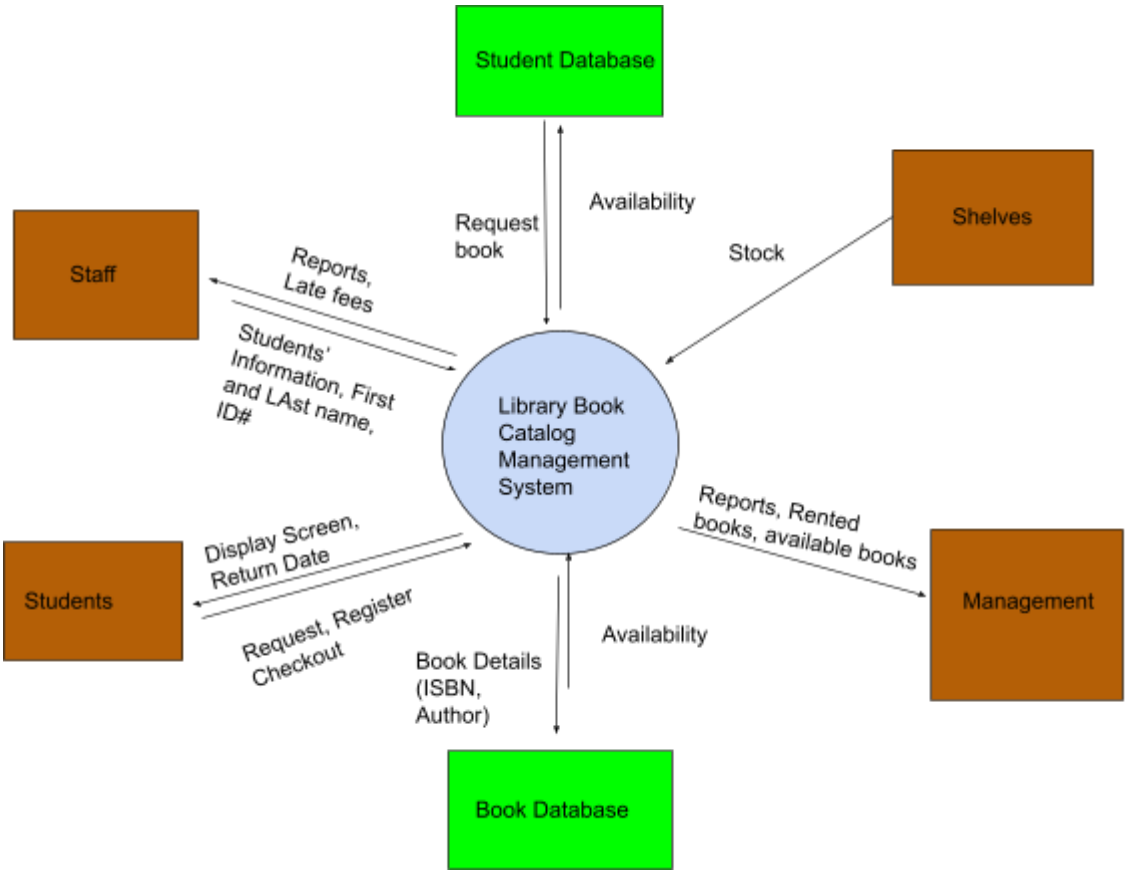
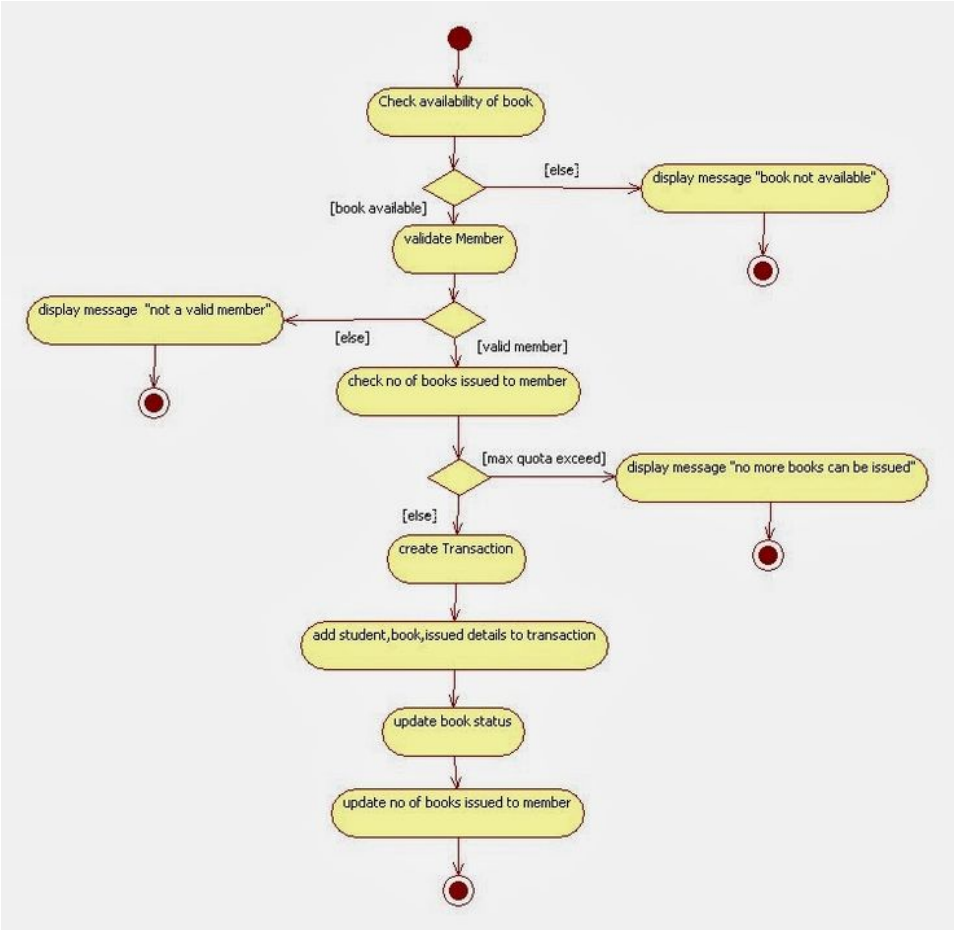
Book Title and Student's Name
List of Borrowed Books
Book Info
Display of Books
Updated List of Borrowed Books
Demanded Book Info

Context Diagram (Con't)





Description of Subsystems

The library subsystems contain a set of universal functionality subsystems intended for use in applications based on the platform. These subsystems offer general-purpose functionality, such as user management, data synchronization, contact information, and application settings.

The subsystems of the this application are as follow:

- Input - The system receives input data from the user, which include password, username, User details (name, ID number, DOB, Graduation year), returning book, adding book with book details (ISBN, author's name, year published).

- Output - The output data is determined by the user input, which is then processed by the system, and displayed on the screen or printer.
- User Data - The user's data is stored in the database, so it can be retrieved everytime the user requests it through an input command. . The user's data consists

of first and last name, student ID number, DOB, any book that has been issued to the user, possible late fees.

- Book Data - The book's data is stored in the database, so it can be retrieved everytime the user requests it through an input command. The book's data consists of ISBN, the book's designated ID number, the title, the author's name, and publication year.

- Functions - These functions are essential to compute the operations given the user's input. Every action the user can take is supported by a function. Even the simple add new user button is supported by a function that computes the request. Functions' responsibilities include reading, and collecting the user's input, searching users, searching books data, and printing the requested information on the screen. Functions are also responsible to compute requests such as modifying book and user details, adding new books, and adding new books and users.

- GUI - The user uses a GUI to send information to the system. The GUI also displays the results of specific requests by the user. THe user could request to create a new registration, add a new book, or issue a book to a student.

Mapping Subsystems and Functional Requirement

Functional Requirements	Subsystems
The user shall register and login	Input, user data, functions, GUI
User shall be able to log out	Output, user data, Functions, GUI
The user shall search books	User data, input, functions, GUI
Users shall be able to issue books	Book Data, Functions, Output, user data, GUI
Users shall be able return books	Book Data, User Data, Functions, Input, GUI
Users shall add books	Input, Book data, Functions, user data, GUI
Users shall manage and update the inventor of books	User data, book data, Functions, input, output, GUI
Users shall check and update student's record	User data, book data, input, output, GUI
User shall check the availability status of books	Input/output, book data, Functions, user data, GUI

Possible Enhancement and Risk Management

The risk management plan starts with collecting data about the system and users who will use the system. This helps in understanding the potential scenarios in the future. The analysis of the time of system access, size of data stored in the system, sensitivity of data, number of users in a day, etc. can offer insights pertaining to plan development. When it comes to a library management system, a fundamental approach should be developed for risk management. It is also a good idea to have a risk manager who can plan regular updates and check up regularly on certain things.

- The budgeting is a very important factor here. If fines are involved, the budget should be discussed for risk management.
- The system vulnerabilities should be checked regularly. The assets related to the library system should be identified.
- Other types of threats include failure of hardware, software, wiring, etc. Data corruption should be avoided by backing up data on some external storage. Firewalls and antivirus software should be used to avoid any malicious intervention.

- ➢ The program can be enhanced by having security measures in place, such as 2FA or MFA to prevent an unauthorised user from accessing a user's account.
- ➢ User accounts can possibly have a timeout session after a period of inactivity to prevent an unauthorised user from accessing a user's account