CS 3560 – Requirements Specification for a Library Management System

CPP aims to convert its current library system into an automated library management system to ensure effective control of loans and reduce operational costs. Currently, all student, book, and loan records are maintained manually. Loans are processed exclusively by the library staff. The personal information collected from students includes their Bronco ID, name, address, and degree. For each loan, a manual receipt is issued to the student, containing header information such as the loan number, student name, borrowing date, due date (when items must be returned), and a list of borrowed items. A copy of each receipt is kept so that staff can later enter the data into spreadsheets. All loan information is then manually converted into reports for business analysis. The library currently lends only one type of item: books. Each book can have multiple physical copies. For each book, the system records its ISBN, title, description, authors, number of pages, publisher, and publication date. For each book copy, the system tracks its bar code, physical location, and status (borrowed or available).

The current loan process works as follows. First, the student browses the library shelves and selects available book copies. Then, the student brings these items to the counter and informs the library staff of the intended borrowing duration. The staff uses this information to register the loan's due date. No loan may exceed 180 days, and a student may not have more than five book copies borrowed simultaneously. If the student has no overdue items, the staff records the loan with all required information, including the specified due date. If any overdue items are found, the loan is denied until the corresponding items are returned. This policy is intended to encourage students to return items on time and increase item availability. If a student needs a book for a longer period, a new loan must be created. The staff will determine whether to re-lend the book based on current demand (i.e., other students requesting the same item while it is still borrowed).When returning items to the library, the staff records the return date in the loan record and places the book copies back in their appropriate locations, making them available again. All items associated with a loan must be returned together; partial returns are not permitted. It is possible to return loaned items before the due date.

Some general complaints about the current system include:

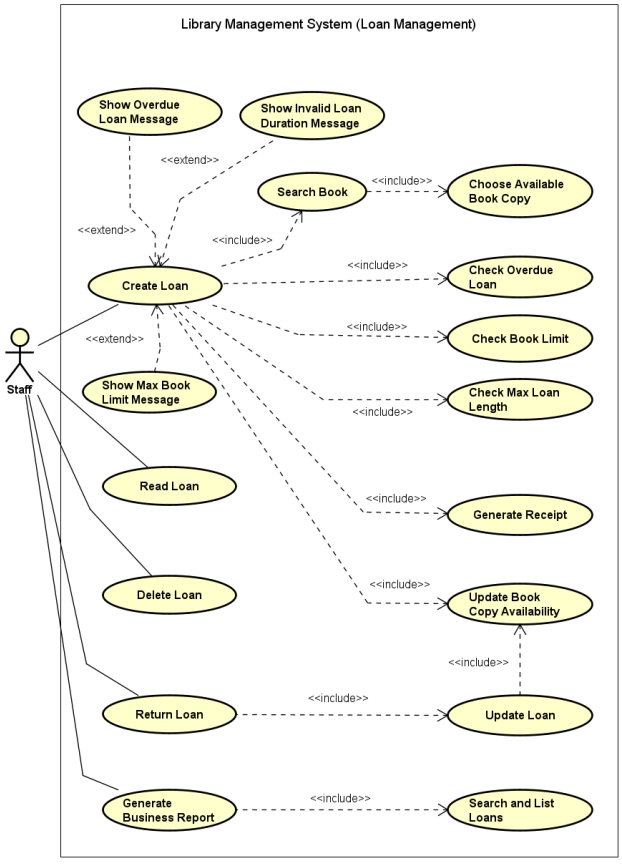
- Slow book search process, as students must manually browse the shelves.
- Inaccurate information regarding book availability and due dates.
- Errors in data entry, particularly in the spreadsheets generated from receipts.
- Lack of consolidated reports on book loans by student and/or period.
- No validation to prevent lending books to students with overdue items or to enforce the five-book-copy borrowing limit per student.
- No validation to restrict loan durations exceeding 180 days.

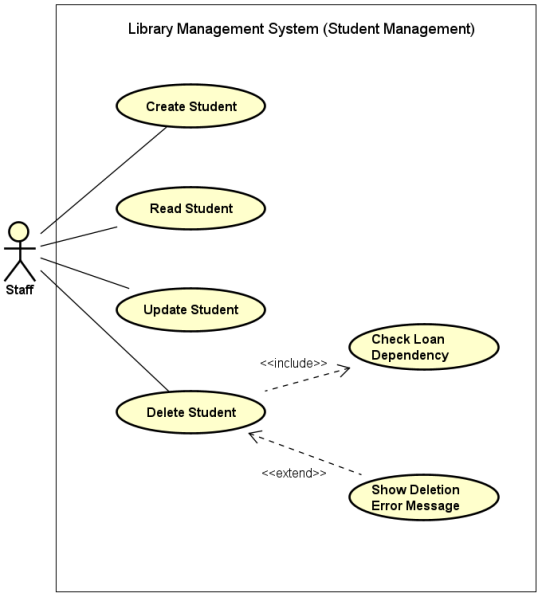
The automated library system should address the issues mentioned above through a *software-based* solution. Specifically, a *desktop application* with a *graphical user interface* should be developed to provide services such as student registration, book and book copy management, loan registration and management, and business reporting. The system must:

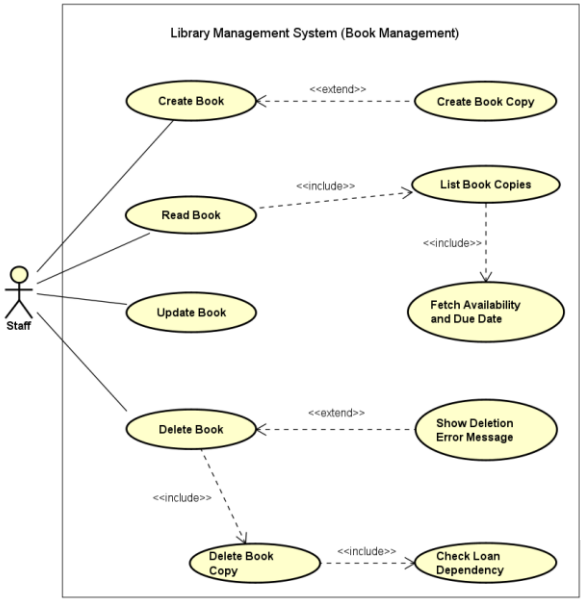
- Allow staff to manage student information.
- Allow staff to manage books and their associated copies.
- Allow staff to search for books and display the availability and due dates of their copies when applicable.
- Allow staff to manage loans and their associated book copies.
- Allow staff to display (on screen) receipts when loans are registered.
- Allow staff to generate (on screen) consolidated loan reports, filtered by student and period.

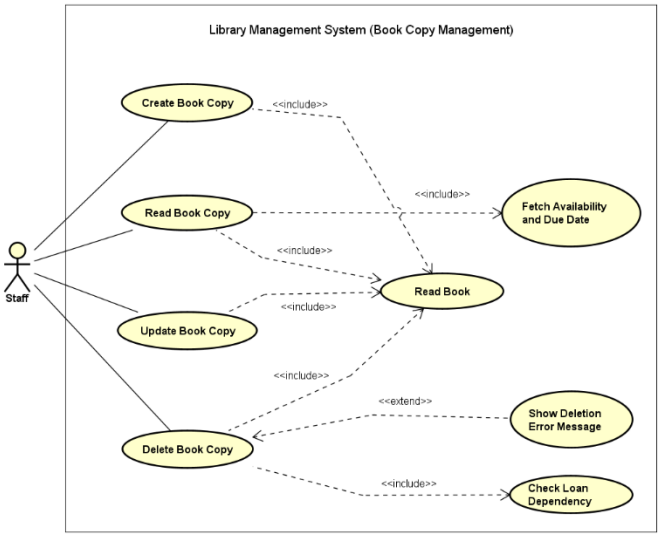
Processes that are outside the scope of this project include: book demand tracking and reservation, fine/charging mechanisms, and user authentication or role-based access.

Use-case diagrams.






Library Management System (Book Management)
Create Book
<<extend>>
Create Book Copy
Read Book
<<include>>
List Book Copies
<<include>>
Update Book
Fetch Availability and Due Date
Delete Book
<<extend>>
Show Deletion Error Message
<<include>>
Delete Book Copy
<<include>>
Check Loan Dependency
Staff


Library Management System (Book Copy Management)
Create Book Copy
<<include>>
Read Book Copy
<<include>>
Fetch Availability and Due Date
<<include>>
Read Book
Update Book Copy
<<include>>
<<include>>
Delete Book Copy
<<extend>>
Show Deletion Error Message
<<include>>
Check Loan Dependency
Staff