AL Local Library Management System
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Problem statement: Even for a smaller locale, managing a public library involves the management of a large number of media and users reliably. This means keeping track of all inventory of various types (DVDs, VHS, CDs, books, magazines), including adding or removing items from inventory, managing users checking out or returning items, managing holds and waitlists for more popular items, and finding locations of items. In addition, a community space like a library can offer spaces for study, group meetings, and conferences, so the management of space reservations must also be carefully managed. Without proper management of inventory and space, problems will arise such as lost or misplaced items, overbooked space, and generally cause major issues in the library's ability to continue to provide service to the community.

Functionality: The system will consist of a database to manage library resources, a web app for visitors to view available inventory and spaces, as well as to manage their own checkouts, holds, reservations, and fees, and a traditional application to allow for staff management of resources onsite, including adding and editing inventory, processing checkouts and returns, and approving space reservations. Both the staff application and the web app will have log ins allowing users to access information from the database in real time (with varying permissions), allowing for visitors and staff to view relevant information in real time.

Objectives: The system sets out to make resource tracking easy for library staff members by keeping real-time records of the location and status of resources and to allow visitors a way to search available resources and manage their checkouts, reservations, and fees from home. The system should be scalable as the library's inventory and visitor counts may vary.

System requirements:

- Staff should be able to:
  - Add new user/library card to system
  - Log in/out/create account
  - Add items of various types (DVDs, VHS, CDs, books, magazines) to inventory
  - Search inventory items
  - View item details (including title, author, ISBN, checkout status, location/shelf, waitlist, checkout history, etc.)

        - Edit item details
        - Remove items from inventory
        - Check out items from inventory on a specified visitor's library card/account
        - Return items to inventory
        - Look up visitor information by library card number (Checkouts, holds, reservations, fees)
        - Approve or decline room reservations
        - Process fee payments for a specified visitor's library card/account
    - Visitors should be able to:
        - Log in/out/create account from library card
        - Search catalogue
        - View item details
        - Place hold/join waitlist for an item
        - View meeting/study space availability
        - Request a meeting/study room reservation
        - View checkout history
        - View overdue items
        - View fees/pay fees

Typical customers: The software would be purchased by library management, so likely city officials, but users would be librarians and library visitors, so these will be considered most when developing system.

Project planning: For the purpose of this project, the system will consist of a web app, a traditional application, as well as a database, all of which will be basic enough to be hosted on my local machine, so everything should be able to run from one machine, but the app will have to be mac/pc compatible while the web app and database will be run from the web. In the case of a business, a larger system would be more practical, so scalability is important.

Development approach: As of now, the plan is to create a relational database in phpMyAdmin, the web application will be created using html/javascript with php, and the web application will primarily be programmed with java. Users will use the web app and java app interfaces to access the database indirectly to provide more security and access controls as well as a better and more usable graphical interface.

Development plan:

- Complete additional modeling/planning activities for system (~1-2 week)
- Develop basic database framework and normalize (~1-2 week)
- Create basic functioning application, integrating access to database (~2 weeks concurrently with next step)

- Create web application, integrating access to database (~2 weeks concurrently with previous step)
- Test functionality and usability (~1 week)
- Adapt/make changes/finalize (~1 week)