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System Design

Library Management System: Functional Requirements Specification

Stakeholders & Their Goals
Primary:
- Library Patron: Users who borrow/return media from the library. These are the people that interact with the library management system to search for media, check availability, and manage their account
    - Goals:
        1. Search for media
        2. Check availability
        3. Borrow and return
        4. Manage Account
- Library Staff: Employees of the library that are responsible for issuing, managing, and cataloging media. These individuals rely on the system to automate tasks.
    - Goals:
        1. Issue, renew, return
        2. Manage overdue procedures
        3. Update catalog

Secondary:
- Library Management: Users responsible for overseeing daily operations.
    - Goals:
        1. Manage staff accounts
        2. Oversee daily operations
        3. Generate reports
- System Admin.: Runs the backend of the library management system.
    - Goals:
        1. System settings
        2. Security
        3. Update system
- IT Support: Those who ensure the system is running smoothly.
    - Goals:
        1. Provide technical support
        2. Troubleshoot
        3. Hardware/software updates

Use Cases
Library Patron (12)
- Search: Patrons use a system to search the catalog for specific media. (2)
- Check Availability: Patrons use the library management system to check if certain media is available. (2)
- Borrow: Patrons use the library to borrow media. (2)
- Return: Patrons use the system to return previously borrowed media. (2)

- Renew: Patrons use the system to renew borrowed materials. (2)
- Manage Account: Patrons use the system to create and manage their personal accounts. (2)

Staff (9)
- Issue: Issue media to patrons. (2)
- Returns: Process returns and update availability. (2)
- Updates to Catalog: Add, remove, or update media. (3)
- Overdue Procedures: Enforce overdue procedures. (2)

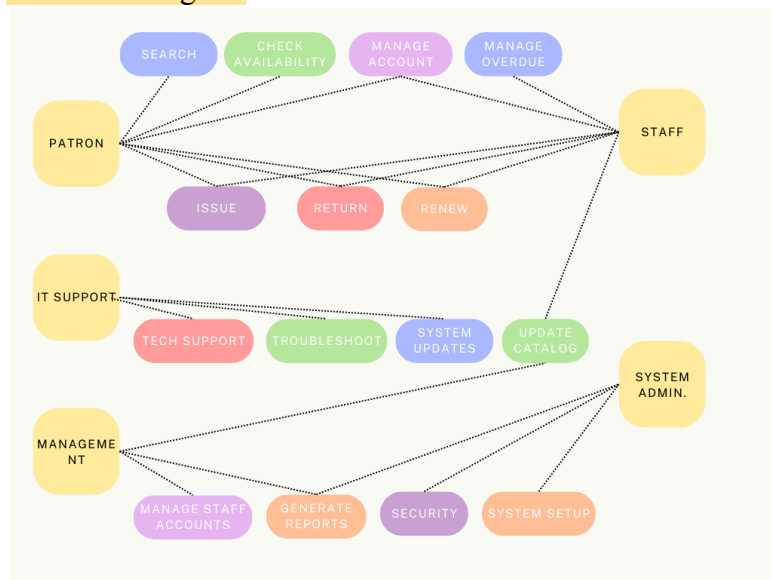Management (7)
- Reports: Generate reports on library performance. (3)
- Manage Staff: Manage accounts and roles. (2)

Admin. (6)
- System Setup: Configure system settings in order to best fit the needs of the library. (3)
- Security: Ensure system security is under control. (3)

Use Case Diagram

Graph above shows all associations! The relationships will be listed down below:
- Borrow Media ← includes → Check Availability
- Return Media ← includes → Manage Overdue Procedures
- Generate Reports ← includes → Update Catalog
- Manage Account ← extends → Renew Media
- Issue Media ← extends → Renew Media
- Library Management ← generalizes → Library Staff
- Search for Media ← generalizes → Check Availability

Class Diagram
- LibrarySystem: Manages all system components
    - Attributes: systemID, systemName
    - Methods: manageUsers(), manageMedia(), generateReports()
- Media: Represents books, movies, etc…

- Attributes: mediaID, title, author, category, availability
- Methods: updateMedia(), checkAvailability()
- Patron: Information about account holders.
    - Attributes: patronID, name, contactInfo, accountStatus
    - Methods: borrowItem(), returnItem(), renewItem(), manageAccount()
- Staff: Library staff who manage the system.
    - Attributes: staffID, name, role
    - Methods: issueMedia(), processReturn()
- Management: Staff roles and additional managerial functions.
    - Attributes: managerID
    - Methods: generateReports(), manageStaff()
- Admin.: System administrators
    - Attributes:adminID, accessLevel
    - Methods: configureSystem(), manageSecurity()
- Loan: Tracks loans given out to patrons.
    - Attributes: loanID, mediaID, patronID, dueDate
    - Methods: calculateFine(), processReturn()