

The Semantic-Conceptual Model of a Library Management System

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Section 1: Project Description

I am creating a library management system that stores information about media and customers. My system will have to keep track of books that get added, checked out or removed permanently from the library. It also has to keep track of the people who sign up for a membership and track what they checked out and when it's due. There will be two kinds of memberships for customers—a child account and an adult account. A child account can only check out age-appropriate media and cannot check out laptops. An adult account has no restrictions. Members can check out a max of 6 media items. Media can be checked out for a maximum of 14 days. For each day media is late, the member will be charged \$0.25 a day if it's a book and \$1 a day if it's a movie or CD.

Section II: Use Cases

Use Case #1

Adam decides that they want to get a library card to be able to use the library. The system asks if they have a library card and they reply no. The system asks for their name, birthday and address. Adam enters the info into the system and Adam is given a confirmation number and is told to go to the librarian's desk to complete the application. Adam goes over to the librarian and gives the librarian their confirmation number. The librarian asks for a government ID and then checks the info with the application that is connected to the confirmation number. Then the librarian gives Adam a library card with a unique account number.

Use Case #2

Sarah is 11 years old and needs to check out a book. The librarian asks for her library card and it pops up as a child account with her parent's info showing as well. The librarian scans the book and sees if the book is allowed to be checked out by a child account. It goes through and the librarian tells Sarah that her book is due in 10 days.

Use Case #3

Bobbi is Sarah's dad and is checking out 2 movies and 1 CD. They swipe their library card into the system and it shows that Sarah has checked out on item. The system informs Bobbi of Sarah's checked out book and the date it is due. The system begins the checkout process. Halfway through, Bobbi realizes that they left out a CD in the checkout process. The system doesn't let Bobbi add the CD until the first checkout process completes.

Use Case #4

Adam is looking through the system to find a movie. Adam finds the movie and sees that it's already checked out. The system asks Adam if they would like to reserve the movie. Adam says yes and the system adds their name to a queue of names that are reserving the movie. Adam receives a confirmation and place number of where they are in line. Adam then finds a CD and checks it out.

Use Case #5

Paige is the head librarian. She searches for all members who currently have late fees. Paige blocks renting access for those who have more than \$10 in late fees. Afterwards, Paige looks at the other librarians' info to see who has been registering new members.

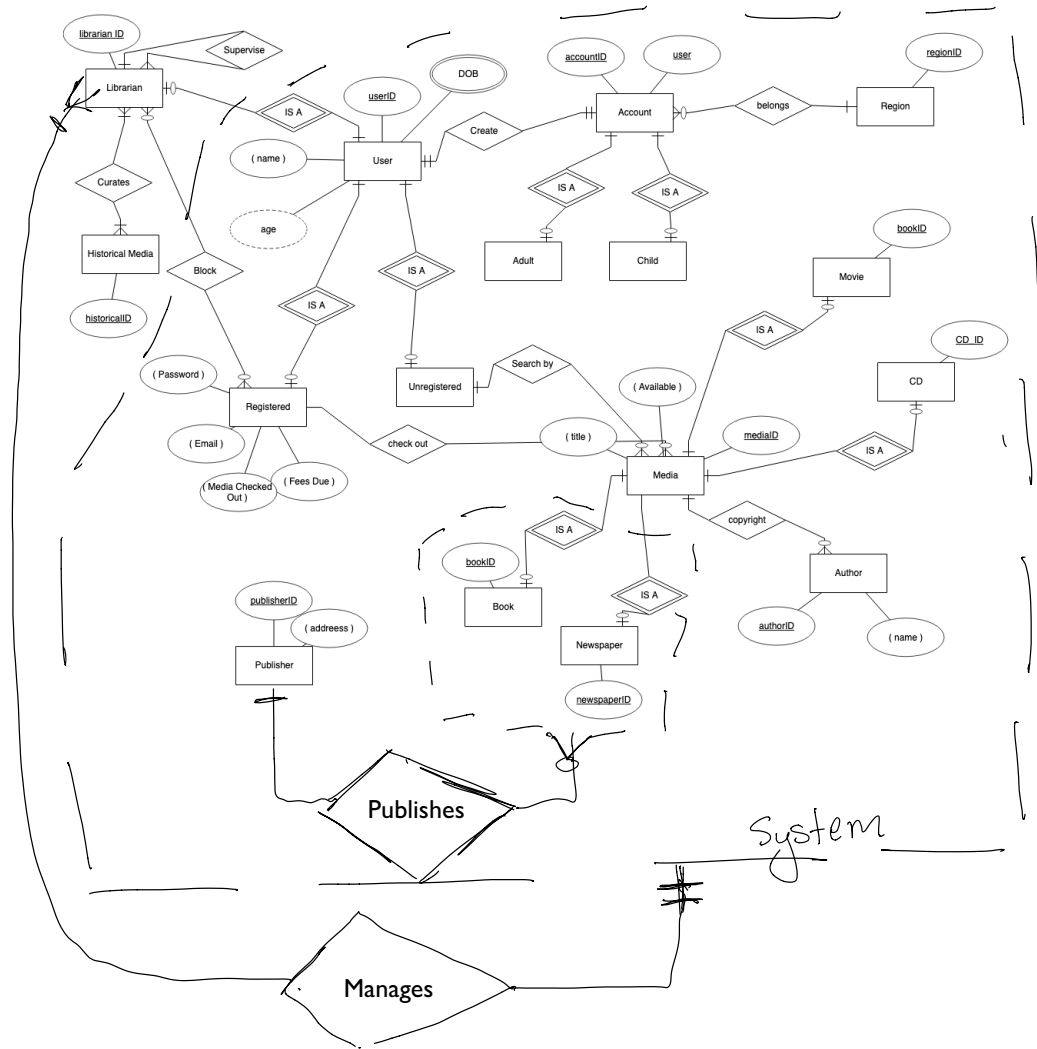
Section III: Business Rules

- 1) A user can only create one account per region.
- 2) A user can be unregistered, registered, and a librarian.
- 3) Unregistered users can search for media.
- 4) Users should be able to rent multiple medias at once before checking out.
- 5) Media can be a book, CD, movie, or newspapers.
- 6) Registered users can only check out media.
- 7) Registered users can be a child or adult account.
- 8) Media is copyrighted by only one author.
- 9) Registered users can search for media.
- 10) Books and newspapers are published by a publisher.
- 11) A librarian can supervise other librarians.
- 12) Librarians can block registered users.
- 13) A librarian manages the system.
- 14) Librarians curate a list of historical media.

Section IV: Detailed List of Main Entities, Attributes and Keys

- 1) User
 - a) userID: key
 - b) name: composite
 - c) dob: multivalued
 - d) age: derived
- 2) Account
 - a) accountID: key
 - b) user: key
- 3) Child Account
- 4) Adult Account
- 5) Region
 - a) regionID: key
- 6) Unregistered
- 7) Registered
 - a) Email: composite
 - b) Password: composite
 - c) Fees_Due: composite
 - d) Media_Checked_Out: composite
- 8) Librarian
 - a) librarianID: key
- 9) Media
 - a) mediaID: key
 - b) title: composite
 - c) available: composite
- 10) Book
 - a) bookID: key
- 11) CD
 - a) Cd_ID: key
- 12) Movie
 - a) movieID: key
- 13) Newspaper
 - a) newspaperID: key
- 14) Author
 - a) Name: composite
 - b) authorID: key
- 15) Publisher
 - a) publisherID: key
 - b) Address: composite
- 16) Historical Media
 - a) Historical_ID: key
- 17) System

Section V: Entity Relationship Diagram (ERD)



Section VI: Testing Table

Rule	Entity A	Relation	Entity B	Cardinality	Pass/Fail	Error Description
1						