

Software Requirements Specification

Version 4.0

for

SOEN 341 Team Project

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1. Introduction

The below is the Software Requirement Specification document which specifies both the functional and non-functional requirements of the project which is a web based application named as student library in which a native administrator has the rights to alter the records of student library, where a client can loan and return items to the library.

Purpose

The purpose of this software requirement specification document is to offer the intended user with the high level understanding of the web application and provide the understanding about functional, non functional requirements and analysis models. This document helps in assisting clients and administrators for completing their jobs and responsibilities.

Scope

A brief description of what the Software Requirements Specifications document applies to, what is affected or influenced by this document.

Definitions, acronyms, and abbreviations

SRS : System Requirement Specification

SAD: System Architecture Document

References

<https://opensource.org/licenses/Apache-2.0>

<https://www.w3schools.com/default.asp>

<https://www.youtube.com/watch?v=pKd0Rpw7O48>

<https://nodejs.org/api/documentation.html>

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2. Overall description

Student Library is a web application which provides the facility to search, loan or return the loaned items such as books, magazines, music and videos to the clients. The native administrator has the right to update the catalog items but can not loan or return.

Administrators can provide the admin rights to the desired clients and have the access to view the timestamps of the clients.

Product perspective

The high level functionality of student library is desired with the help of client-server architecture as shown below.

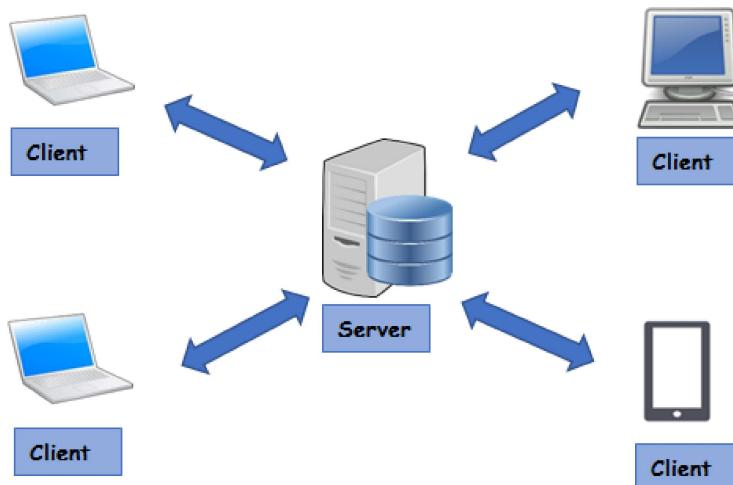


Image 1: A client-server architecture.

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Product functions

Library web application provides the functionalities of adding, deleting, modify and search the printed and media items from and to the database through administrators role whereas the clients have the privileges of search, loan and return the item from the library database. Native administrator has the right to create and remove other administrators from the database.

User characteristics

The intended users of the system are the clients who has successfully signed up into the library application. Clients are expected to have a minimum level of high school education, basic understanding of computer operation and accessing web applications.

Constraints

1. The Application should be able to handle the Load.
2. User is not able to Loan/return Item through application.
3. Application is accessing database multiple times.

Assumptions and dependencies

1. For the web application is to work efficiently it is recommended that the system to be connected to the internet.
2. The database should consist of at least one native database in order to access the web application.
3. It is expected that the administrators or clients are having minimum knowledge on working with computers and web applications.
4. The web application is expected to be connected to the database for uninterrupted services.
5. It is expected that the server is up and running.

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3. Specific requirements

3.1 External interfaces

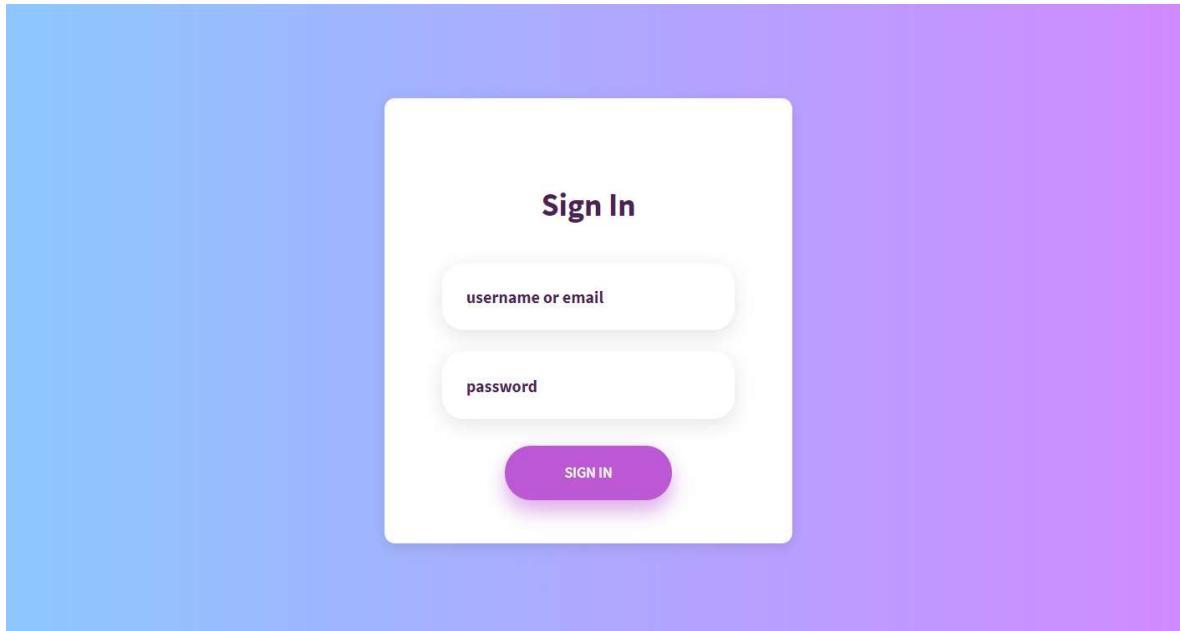


Image 2: User-Interface(Admin Login Page)

3.2 Functional requirements

Functional requirements capture the intended behaviour of the system. This section contains the *Actor Goal List* and the *Use Case view*.

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Actor goal list

Actor	Goal
Administrator/Client	Login/Logout
Administrator	View Active Users
Administrator	Create Items in Catalog
Administrator	Delete Items in Catalog
Administrator	Modify/Update Items in Catalog
Administrator/Client	Search Items in Catalog

Critical requirements

The following are the critical requirements in our project:

1. Login
2. Modify/Update
3. Create
4. Delete
5. Search

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Use Case View

The following figure shows a use case model.

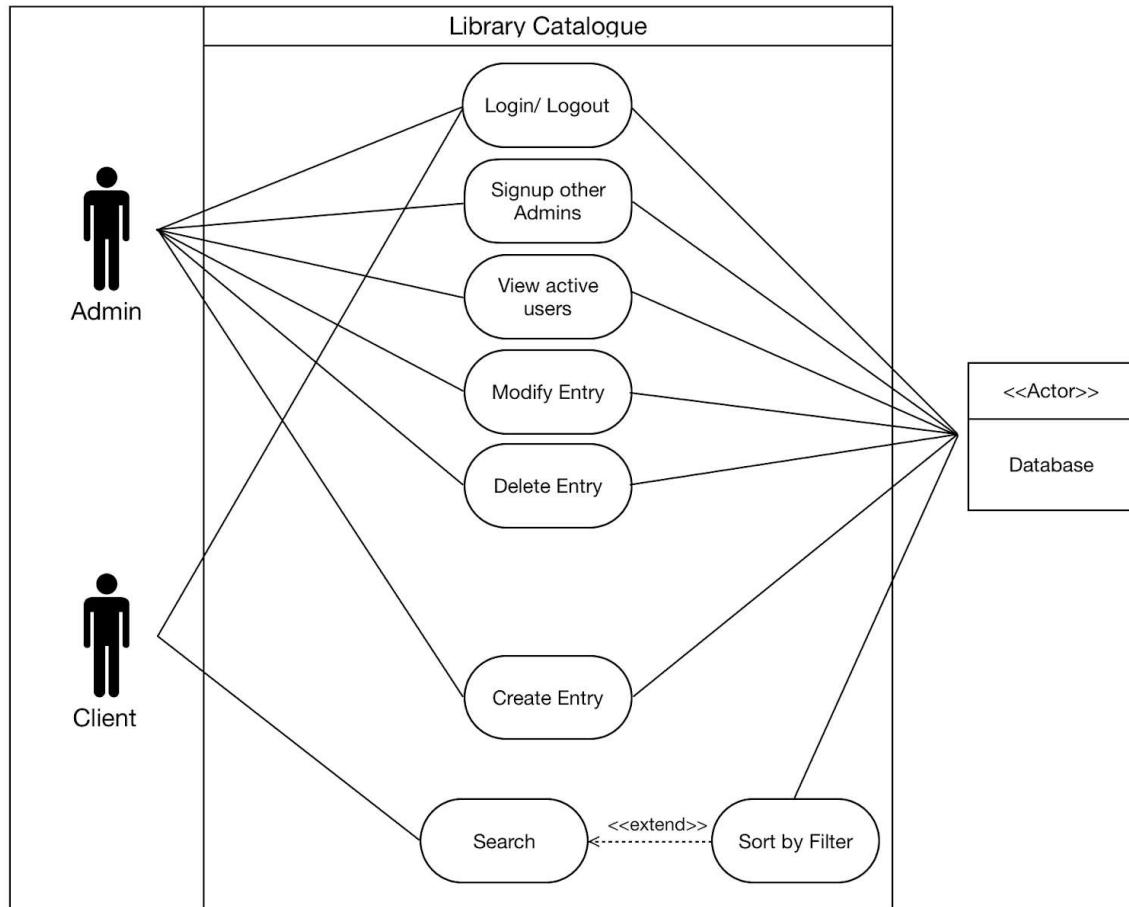


Image 3: Use case model

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Fully dressed Use Case list

Use Case UC1	Login
Primary Actor	Client and administrator
Stakeholders and interests	Client and administrator want to logIn into his account
Preconditions	Client /administrator is registered in the system or can sign up
Post conditions	Client /administrator logged In
Basic Flow	1.1 Client /administrator input logIn information 1.2 System checks the database for the logIn informations 1.3 System makes Client /administrator logged In
Alternative Flow	1.2.1 If logIN information not compatible, logIn fails. 1.2.2 Client /administrator is asked to re-enter logIn information.
Importance	5/5

Use Case UC2	Create Item
Primary Actor	Administrator
Stakeholder and Interest	Administrator wants to create an entry into the database.
Preconditions	Administrator has been logged into the system.
Post Conditions	Required entry was created into the database.
Basic Flow	2.1 Administrator selects creates item option. 2.2 Administrator selects the type of entry to be created.

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	2.3 Administrator enters details of the entry. 2.4 Administrator confirms the entered data and submits the request to the database. 2.5 Entry has been created into the database.
Alternate Flow	2.1.1 New entry already exists in the database. 2.1.2 Administrator verifies the existing data.
Importance	5/5

Use Case UC3	Modify Items
Primary Actor	Administrator
Stakeholders and Interests	Administrator wants to modify items from the database.
Preconditions	Item exists in the catalog.
Post Conditions	Items were modified.
Basic Flow	3.1 Admin searches for item in the catalog. 3.2 If Found- alter information about the item.
Alternative Flow	3.1.1 System will print error message if two of the administrator wants to perform the same operation.
Importance	5/5

Use Case UC4	Search Items
Primary Actor	Client
Stakeholders and Interests	Client wants to find an item in the Catalog.
Preconditions	Client is logged in the system.
Post Conditions	Items were found and retrieved from the database.

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Basic Flow	4.1 Client select the view the catalog. 4.2 Client select the filtering criteria. 4.3 Database returns the corresponding items.
Alternative Flow	4.3.1 Database returns empty set. 4.3.2 System print error message.
Importance	3/5

Use Case UC5	Delete Item
Primary Actor	Administrator
Stakeholders and Interests	Administrator wants to delete an entry from the database.
Preconditions	Administrator is logged in to the system.
Post Conditions	Selected entry is deleted from the database.
Basic Flow	5.1 Administrator selects delete entry option. 5.2 Administrator selects the type of entry to be deleted. 5.3 Database returns requested data. 5.4 Administrator selects entry item to be deleted. 5.5 Entry gets deleted from the relational database.
Alternative Flow	5.3.1 Database returns empty data set. 5.3.2 System shows no items present in the system.
Importance	4/5

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3.3 Non-functional requirements

Performance efficiency

The web application should have an easy interface and have a short response time. It should also use non redundant database.

Compatibility

The web application should be compatible with all browser, operating system and should have the same display and interface on all of them.

Usability

All the process and purpose of the components are defined, Clients and administrators can easily follow what to do and what are the available options.

Reliability

The system is working well as expected in timely manner as long as servers are up and running without any interaction problem. There should not be any unexpected errors.

Security

The application is secured from unauthorised entry or misusage of data by only allowing the client and administrators with valid credentials.

Maintainability

The Application is good to be maintained in future by referring to user documentation and in which addition of new functionalities and optimising the website for better usability can also be performed.

Portability

The Web Application was designed to work in both Windows and Mac OS.

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Design constraints

This Library Web application will be developed using Express.js with object-oriented programming Node.js as the main code language. All the design constraints were retrieved from Description of the project and are well summarized in the domain model. There are no purchased component and all development software are open-source tools.

(Online) user documentation and help

There will not be any online support such as help, etc.

Purchased components

Library Web Application does not require any purchased components.

Licensing requirements

No licence is required, any one with a valid username and password can access the Library Web Application.

Legal, copyright and other notices

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4. Analysis Models

4.1 UML System Sequence Diagrams

The diagrams displayed ahead cover the LogIn and Modify Item Use Cases, in the case of the administrator, and the Loan and Return, in the case of the Client.

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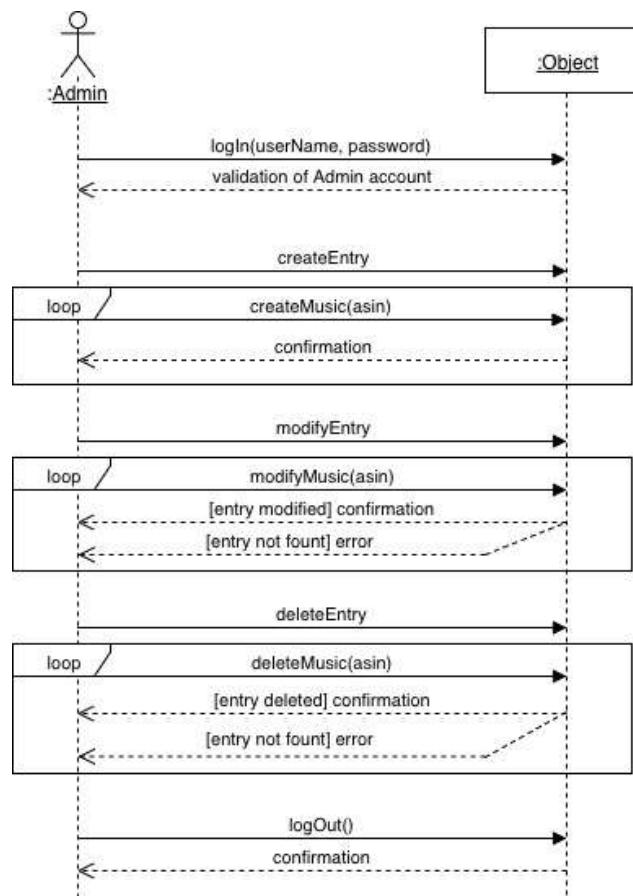


Image 4: Administrator SSD

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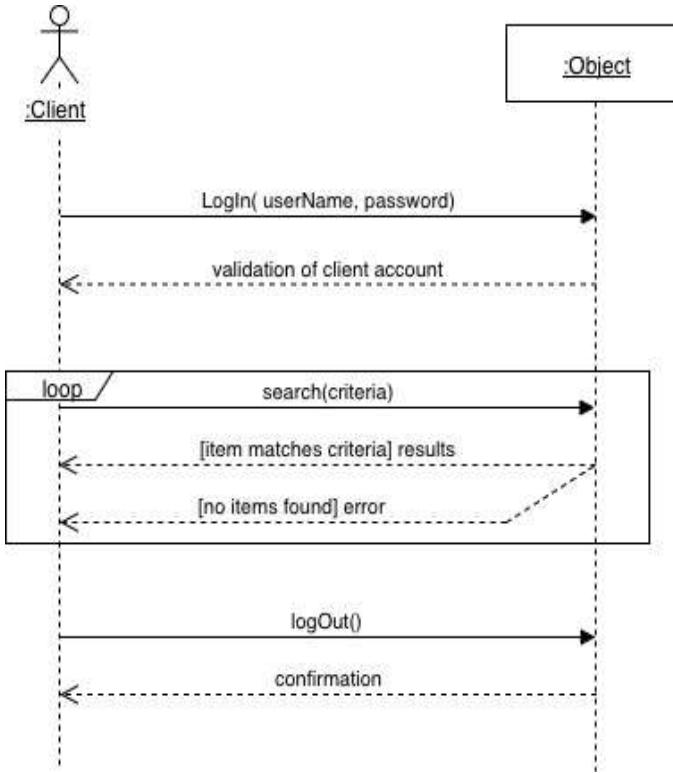
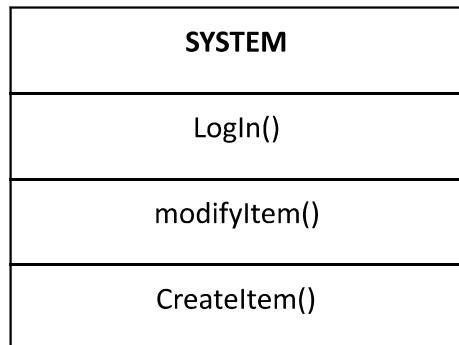


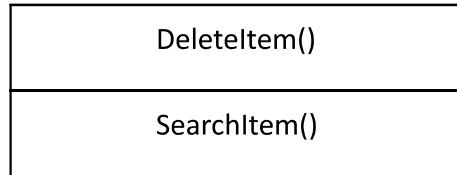
Image 5: Client SSD

Since there are different types of entries in the Catalog, the Music method is just an example of one of the possibilities.

4.2 System Operations



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4.3 Operation Contracts

Contract CO1	Login / LogOut
Operation:	Login()
Cross Reference:	UC1: Login
Preconditions:	1.1 Website is up and working. 1.2 Administrator/Clients credentials are registered in the database.
Postcondition:	Admin or Client has successfully logged in / out of the website.

Contract CO2	modifyItem
Operation:	modifyItem(item)
Cross Reference:	UC2: Administrator can modify or update items in the catalog.
Preconditions:	2.1 Administrator is authenticated. 2.2 Instance of item exists in catalog.
Postcondition:	2.1. An instance of <u>I1:item</u> is added to the 2.2. I1 has been modified/deleted from the catalog.

Contract CO3	CreateEntry
Operation:	CreateEntry()
Cross Reference:	UC2: Create Item

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Precondition:	Administrator instance is created and authenticated.
Post Condition:	An instance of CreateEntry is created.

Contract CO4	SearchItem
Operation:	SearchItem()
Cross Reference:	UC4:Search Item
Precondition:	Client instance is created and authenticated.
Postcondition:	All relevant information regarding the search request will be displayed.

Contract CO5	DeleteItem
Operation:	DeleteItem()
Cross Reference:	UC5:DeleteItem
Precondition:	Administrator/client instance is created and authenticated.
Postcondition:	The data from database is deleted and updated.

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4.4 UML Conceptual Class Diagram ('Domain Model')

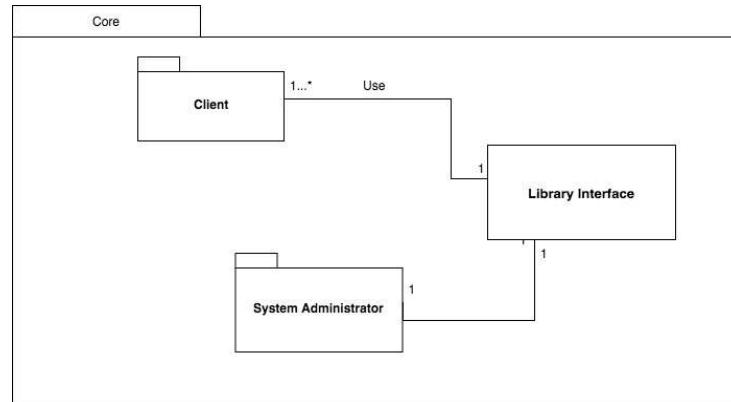


Image 6: Domain Model - Packages

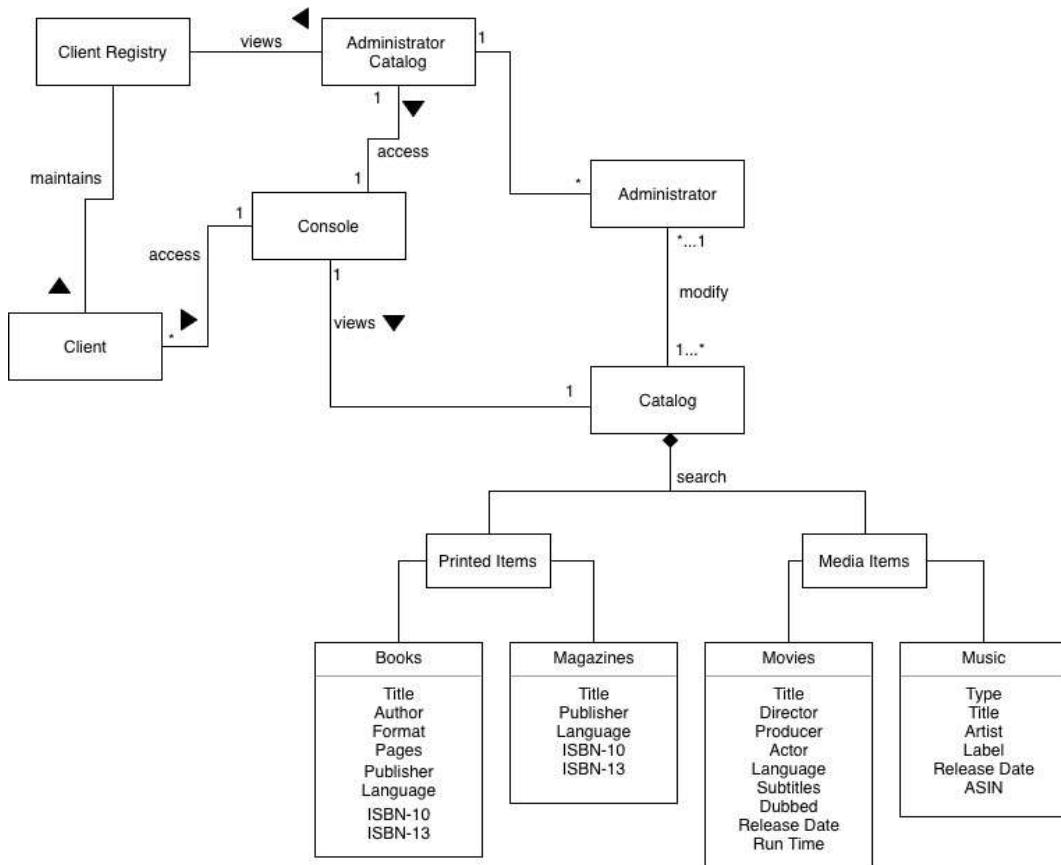


Image 7: Domain Model