1 INTRODUCTION

1.1 Purpose

This Software Requirement Specification (SRS) document provides a complete list and description of all the functions and specifications of the Library Information System (LIS).

The software is meant to hold the records of the books and the users and to provide the functionality of issuing and returning books. Apart from that the users can also request to reserve a required book if available in the library.

The expected audience of this document are Library clerk , librarian of an institute and the developer of the software.

1.2 Document Conventions

The conventions used in the document are given as follows

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1.3 Definitions

The following terms are used in this document to refer to various componensts of the system :

Librarian	Person-in-charge (human administrator) of the software
Member	Members of the library who can issue a book
Issue	The act of borrowing a book by a user against his/her account
Return	The act of returning the book issued by an user previously
Reserve	The act of reserving a book currently unavailabele but for issuing in future
Fine	The penalty to be paid by a user in case he/she fails the deadline to return the book
ISBN	International Standard Book Number, a unique ID for each book

1.4 Intended Audience

The intended readers of this document are the developers of the software, testers, library owners and managers and coordinators. They can understand the functioning of the software and their individual roles in the software also. Any suggested changes on the requirements listed on this document should be included in the last version of it so it can be a reference to developing and validating teams.

1.5 Scope

LIS is a GUI tool that enhances the manual process of keeping records in a library.This is an appication which has been designed keeping in mind that it is meant to run on Library computers and to allow the library to keep a track of the books present.It allows the users to check availabilty whenever they want.

It also allows the users to reserve a book in advance if needed. The librarian is able to keep a record of the overdue books, add new books, dispose old data, add new member or delete a member.

It is a powerful but still functionally simple library management software for big libraries and can provide a free easy-to-use system for rising libraries.

Presently the maximum number of books has been kept constant to ensure a fruitful implementation of the software architecture. In future the list of books may be made to increase dynamically to make it more realistic.

1.6 References

The following references have been consulted to make a suitable and effective software for library information system.

- IEEE standard 830-1998 recommended practice for Software Requirements Specifications-Description
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2 OVERALL DESCRIPTION

2.1 Product Perspective

The product is meant to automate the manual work of a librarian and library clerk to increase the efficiency of the process. It will facilitate the users to check a book's availability status . One can reserve, issue and return a book via this software. The software is designed to automatically update the details in the account of the user thus minimizing the laboriuos work earlier used to be performed by the clerks in the manual process.
One can genrate the reports and penalty bills via this software directly. It is designed to make the proces of issuing and searching books more easy.
It is designed to make the process of issuing, reserving and returning of a book more swift and efficient with minimum manual effort.The background cron job takes care of updation of the user account in case any of the above functions are performed.

2.2 Product Features

The product provides the features to create a librarian , library clerks and a set of users comprising of UG student, PG student, Faculty and Research Scholar.

All the users irrespective of their type can issue and return a book.The librarian has some special functions like creation of a library member/user. The librarian can have access to account of any user and can look into it in case need arises. Library clerks on the other hand can add and remove a book from the

database of the library. They also have been assigned methods to impose fine in case of defautlters.

Finally there is a non-physical member called as LIS (syatem admin) which is autonomous and monitors all the finctioning of the software. It automatically notifies about the delays to the clerks and helps to update and keep track of all the activities of the software.

A class diagram showing the relationship is given below to enhance the understanding of the workflow.

subsubsectionUse cases

1. User use cases:
    - Query about Book
        - Preconditions: 1. The user must be logged in . 2.The book must exist in the library
        - Postcondition: If the book exists in the library,the availablity status of the book is returned
        - Failure Situations: The library does not have the book
        - Postcondition in case of failure:A message to user about the same
        - Actors: User communiates with the system
        - Trigger: User chooses the option to search books
        - Main Success Scenario: The library has a copy of the book and it is available for issue.
        - Extensions/Variations: The library has a copy of the book but currently none of the copies are available.The book maybe reserved by the user.
    - Issue Book
        - Preconditions: 1. The user must be logged in . 2.The book must exist in the library 3.It must be available for issue. 4.The user must not have exhausted his quota of number of books
        - Postcondition:After successful issue the user account is updated
        - Failure Situations: 1. The library does not have the book 2.The library has the book and it is not avaiable for issue. 3.The user has exhausted his quota of maximm number of books
        - Postcondition in case of failure:In failure case 2. the user may choose to reserve the book if he has not exhausted his quota
        - Actors: User communiates with the system
        - Trigger: User chooses the option to issue books
        - Main Success Scenario: The library has a copy of the book and it is available for issue.
    - Return Book

  - Precondition: 1.User must be logged in. 2.User must have previously issued the book.
  - Postcondition: 1.If the book was overdue the penalty is calculated and a bill is printed 2.In case the book was reserved by some other user, a notification is sent out to the other user. 3.The user account is updated
  - Failure Situations:The user has not issued any book
  - Postcondition in case of failure:A message is give to the user about the same
  - Actors: User communiates with the system
  - Trigger: User chooses the option to return issued books
  - Main Success Scenario: The user had previously issued the book
- Reserve Book
  - Preconditions: 1. The user must be logged in . 2.The book must exist in the library 3.It must not be available for issue. 4.The user must not have exhausted his quota of number of books
  - Postcondition: 1.After successful issue the user account is updated 2.When the book is returned a notification is sent to the user.
  - Failure Situations: 1. The library does not have the book 2.The library has the book and it is avaiable for issue. 3.The user has exhausted his quota of maximm number of books
  - Postcondition in case of failure:In failure case 2. the user may choose to issue the book if he has not exhausted his quota
  - Actors: User communiates with the system
  - Trigger: User chooses the option to reserve book
  - Main Success Scenario: The library has a copy of the book and it is not available for issue.
- Cancel Reservation
  - Preconditions: 1. The user must be logged in . 2.The user must have reserved the book
  - Postcondition: 1.After successful issue the user account is updated Failure Situations:The user has not issued any book
  - Actors: User communiates with the system
  - Trigger: 1.User chooses the option to cancel reservation of a book 2.User does not issue the reserved book within 7 days of return
  - Main Success Scenario: The library has a copy of the book and the user must have reserved it previously
- Pay Fine
  - Precondition:

    (a) User must be logged in.

(b) User must have previously issued the book.3.The book must be overdue

- Postcondition:
  The book was overdue the penalty is calculated and a bill is printed
- Failure Situations:
  (a) The user has not issued any book
  (b) No returned books are overdue
- Actors: User communiates with the system
- Trigger: User chooses the option to return issued books
- Main Success Scenario: The user had previously issued the book and the book is overdue

2. Library Clerk Use Cases

   - Enter details of a book
     - Preconditions:1. The clerk must be logged in.2.The book must not be previously entered in the system Failure Situations: The book is already in the system Postcondition in case of failure:A message to clerk about the same Actors: library clerk communicates with the system Trigger: Clerk chooses the option to enter new books Main Success Scenario: The library does not have the book and the book is newly entered in the system Extensions/-Variations: The library hasthe book and the umber of copies is increased
     - Delete a book
       * Preconditions:1. The clerk must be logged in.2.The book must be previously entered in the system 3.The librarian has decided to dispose the book Failure Situations: The book is not in the system Postcondition in case of failure:A message to clerk about the same Actors: library clerk communicates with the system Trigger: Clerk chooses the option to delete books Main Success Scenario: The library has the book and it is removed from the system. Extensions/Variations: The library has the book and the number of copies is reduced.

3. Librarian Use Cases:

   - Add new member
     - Preconditions:1.Librarian must be logged in2. A person must apply for membership Postcondition:A new member account is created Failure Situations: The user is already registered Postcondition in case of failure:A message to librarian about the same Actors: Librarian communicates with the system Trigger: Librarian chooses the option to add member Main Success Scenario: The user is not previously registered

- Delete member
  - Preconditions:1.Librarian must be logged in2. A person must apply for cacellation membership Postcondition:The member account is deleted Failure Situations: The user has no account Postcondition in case of failure:A message to librarian about the same Actors: Librarian communicates with the system Trigger: Librarian chooses the option to delete member Main Success Scenario: The user previously has an account
- Order to print reminder
  - Preconditions:1.Librarian must be logged in2. A book issued by a member must be overdue Postcondition:A message is sent to the user. Failure Situations: There are no overdue books Postcondition in case of failure:A message to librarian about the same Actors: Librarian communicates with the system Trigger: Librarian chooses the option to print reminder Main Success Scenario: There are some overdue books
- Plan to dispose books
  - Preconditions:1.Librarian must be logged in2. The book must not have been issued even once for 5 years Postcondition:The book is disposed with a message to the library clerk to delete it. Actors: Librarian communicates with the system Trigger: Librarian chooses the option to dispose book Main Success Scenario: The book has not been issue for 5 years

4. System Use Cases:

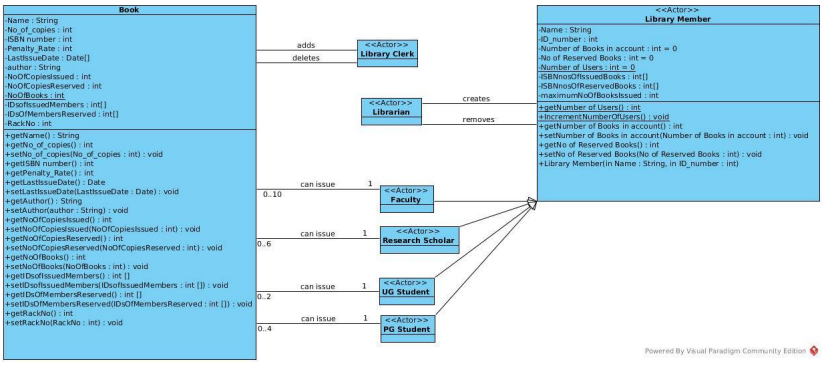
- Answer availibilty Query about Book
  - Preconditions:1.An user makes a query Postcondition: If the book is available, use cases display rack number and number of copies are called Actors: System communiates with the user Trigger: User chooses the option to search books
- Display rack number of book
  - Preconditions:1.If the book is available the use case answer availibility query invokes this Postcondition: Rack numbers are displayed Actors: System communiates with the user Trigger: answer availibity query triggers this
- Display number of copies of book
  - Preconditions:1.If the book is available the use case answer availibility query invokes this Postcondition: the number of copies of a book are displayed Actors: System communiates with the user Trigger: answer availibity query triggers this
- Calculate lateness penalty

- Preconditions:1.If the book is overdue, return book invokes this Postcondition:Penalty is calculated and print bill is invoked Actors: System communiates with the user Trigger: return book query triggers this

- Provide book issue statistics
  - Preconditions:1.The use case is invoked by plan to dispose books Postcondition:Statistics of books is displayed Actors: system communicates with librarian Trigger:Plan dispose book is invoked

5. Printer use cases:

   - Print bill of penalty
     - Preconditions:Some user must have returned the issued book later than his designated return date. Postcondition:Bill of penalty is printed Actors: Printer communiates with the system Trigger: Calculate lateness penalty triggers print bill
   - Print reminder
     - Preconditions:Some user must have exceeded the due date Postcondition:Reminder to user is printed Actors: Printer communiates with the system Trigger:order to print reminder triggers this
   - Print notification on return of reserved book
     - Preconditions:Some user must have returned a reserved book Postcondition:A notification is printed to the user who reserved the book Actors: Printer communiates with the system which communicates with user Trigger: return book may trigger this use case



- Issue Book : Allows the librarian to issue books to members on request

- Return book : Whenever a member returns an issued book , the library system uses this data to update the database and user history simultaneouly. This data can also be used to calculate fine if the book is returned late than the deadline
- Add book : It allows the librarian to add books to the library database
- Delete book : The librarian has an option to remove a book from the library database
- Add/Remove members : The software allows the user to add members like the faculty and the other students to have access to the books in the library
- View history : The librarian can view the issue history of any book in the library
- Query : The library can search for a particular book by giving a part of its name or the full name of the book.

2.3 User Classes and Characteristics

2.4 Operating Environment

The software is designed to run on the following environments :

- Windows
- Ubuntu 14.04.03 (LTS version)

  Any OS with the support of Java JDK and JRE libraries 1.7 and above can be used to execute the software.

2.5 Design and Implementation Constraints

This software is optimized to run on a maximum of 10000 books . Exceeding this number can result in a slower running time of the algorithm and thus the execution may not fruitful enough.

2.6 User Documentation

User manual :

User Login

Any user with a valid username and password will be able to login to the software to access the features. Initially just after the installation of the software only a librarian can be created in the software. Upon thd creation of the librarian the librarian can then create the other users in the library.

- For librarian : If a user logs in as librarian he is then shown a librarian home page screen with the functionalities exclusively of a libraraian.
- For clerk : If user logs in as clerkhe is then shown the clerk home page with the functions like adding or deleting book etc.
- For others(members) : We switch on to a new screen which is the home screen of the member. The member has the options of issuing, reserving and returning a book.

User creation

The librarian can be created in the beginning when the software is first installed. Once a librarian is creates an new librarian can not be created until and unless the old one is removed.
Only the librarian can create a new member of the library like the faculty or the students. During the creation of a member the librarian should also provide the type of the user as the maximim book count is different for different categories of the users.Once the type of a library member is given during creation one does not need to provide it anywhere else during issuing or returning of a book as it will be saved in the database and automatically fetched when required.

Librarian Home Screen

The librarian hold the administrator access of the library.The feature available to him are as follows :

- Creation of user : For this purpose the librian will be directed to a new scree where he will have to provide the necessary details in order to create a new account and he has to provide the member type during account creation.

2.7 Assumptions and Dependencies

3 SYSTEM FEATURES

3.1 User login

The software should allow the user to provide the details of a

4 EXTERNAL INTERAFCE REQUIREMENTS

4.1 User Interfaces

4.2 Hardware Interfaces

1. The software is run offline so hard disk with sufficient space of about — is required to store and save the records for further use

2. Keyboard and mouse to interact with the GUI

4.3 Software Interfaces

1. Back end : Built using Java and DBMS
2. Front end : Using Java

4.4 Communication Interfaces

5 OTHER NONFUNCTIONAL REQUIREMENTS

5.1 Performance Requirements

With the Library Information System the librarian and library clerk can process a book transaction in a faster speed . The members will be able to check the status of the checked out items and can also borrow and return a book in a short amount of time. Automatic updates in the account of each user will enable them to know about the item they have cjecked out and all the relevant details due to which they do not need to consult or ask the library clerk each time. The background system admin will automatically perform the above mentioned updation in the accounts in the background autonomously without explicit invocation. In case of defaulters the fine and other penalties should be automatically reported and saved in the record once the deadline has crossed . This is also performed by the syatem admin (referred as LIS itself) in the background. ALl the background tasks should not compromise with the UX of the software.All the background processes should be methodically handled and not affect the runtime functionalities of the software

5.2 Safety Requirements

Only the valid users can change the records that too only in their respective account.

5.3 Security Requirements

The sytem must be highly secure in the login part. No user should be able to access a domain outside his reach. Care must be taken to keep the user accounts secure and all the book transaction should be properly updated to the corresponding user.

5.4 Software Quality Requirements

5.4.1 Reliability requirements

The background database should always be updated so that whenever a member visits he/she can get the latest information required.

5.4.2 Usability Requirements

The software must be user-friendly so that the user can easily perform all the tasks which the software is meant to do.It must have a soothing UX design and clear instructions to guide the user.
In case of any error suitable error messages must be displayed to assist the user.

6 OTHER REQUIREMENTS