SOFTWARE REQUIREMENTS SPECIFICATION

for

Library Information System (LIS)

Version 1.0

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1 Introduction

1.1 Purpose

The purpose of this project is to develop an application website to monitor different activities of the library of our institute pertaining to the issue and return of the books by the members of the library and to automate as well as speed up various works of staff members such as managing books database which includes issuing, adding, removing books and maintaining user profiles.

1.2 Document Conventions

The following standards document conventions are used in our document: IEEE STD 830 -1998, IEEE Standard for Software Requirement Specification.

1.3 Intended Audience and Reading Suggestions

This document is intended to assist the users when they use the software and for developers and the project managers to plan their project and implement the software required. This Software Requirement Specification document is divided into Six subsections:
Section 1: Introduction
Section 2: Overall Description of the Software giving information about functions, user classes, operating environment, constraints and documentation.
Section 3: External Interface Requirements giving a brief introduction to user, hardware, software and communications interfaces.
Section 4: Detailed functional requirements of different features.
Section 5: List of non-functional requirements
Section 6: Other requirements

1.4 Project Scope

The main goal of the project is to build an online Library Information System, which will not only be helpful for staff members to keep track of all kinds of databases, but also provides a user-friendly interface.

1.5 References

The documents and websites referred to, are as follows:

- IEEE STD 830 -1998, IEEE Standard for Software Requirement Specification

2 Overall Description

2.1Product Perspective

An online library information system can be viewed from a product perspective as a software application designed to facilitate the management and organization of library resources and services in a digital environment. The following are some key features that are included in the product:

- User-friendly interface: The system should have an intuitive interface that allows users to easily search and access library resources.
- Access control: The system should provide access control mechanisms to ensure that only authorized users can access certain resources.
- Resource management: The system should allow librarians to manage and organize resources, such as books, journals, and multimedia materials, in a structured and efficient way.
- Search and retrieval: The system should provide robust search and retrieval capabilities, allowing users to quickly locate relevant resources.
- Circulation management: The system should include circulation management features, such as checkout and return, to ensure that library resources are properly tracked and accounted for.
- Analytics and reporting: The system should include analytics and reporting capabilities that allow librarians to track usage patterns, identify trends, and make data-driven decisions.

2.2 Product Functions

The following functions are provided by the software

- There are four categories of members of the library: undergraduate students, post graduate students, research scholars, and faculty members.
- Each library member is assigned a unique library membership code number.
- Each undergraduate student can issue up to 2 books for 1-month duration.
- Each postgraduate student can issue up to 4 books for 1-month duration.
- Each research scholar can issue up to 6 books for a 3 month duration.
- Each faculty member can issue up to 10 books for a six month duration.
- **Login by different entities-** Librarian, Library Clerks, Students (Undergraduates, Postgraduates, Research scholars) and Faculties.
- The Library Clerks can add the details of a new book in the database. They can also remove unused old books from the database.
- Students and Faculty members can issue books, view their profiles including issued books, their expiry date and penalty for overdue if any.
- The Librarian has control over all of the software including adding, editing or removing user profiles.
- When a member returns a book, LIS prints a bill for the penalty charge for overdue books. LIS calculates the penalty charge by multiplying the number of days the book is overdue by the penalty rate.
- LIS prints reminder messages for the members against whom books are overdue, upon a request by the Librarian.
- LIS maintains the statistics regarding issuance of different books.

2.3. User Classes and Characteristics

- **Student**
  - Create account with login credentials
  - View/Update his/her profile
  - Issue books
  - Checking the list of issued books, their expiry date and penalty of overdue if any
  - Has 3 subclasses: undergraduate students, post graduate students, and research scholars.
- **Faculty**
  - Create account with login credentials
  - View/Update his/her profile
  - Issue books
  - Checking the list of issued books, their expiry date and penalty of overdue if any
- **Library Clerks**
  - Add the details of a new book in the database.
  - Remove unused old books from the database.
- **Librarian (Admin)**
  - Possess all the characteristics of above-mentioned classes
  - Add, Edit or Remove users of any class

2.4 Operating Environment

The software is an online based portal and is thus platform independent and can be used in all well-known browsers.

2.5 Design and Implementation Constraints

- Limited Storage provided in the sqlite3 Database.

2.6 User Documentation

The Webpage is user-friendly and a Help Section is also provided in the portal.

2.7Assumptions and Dependencies

- The user must be familiar with the internet and capable of connecting to the platform with a web browser.
- No accessibility features are provided on the platform assuming that the disabled users' device provide those if any such users use this platform.
- Connecting and using the platform requires:
  – working internet connection.
  – compatible browser

3 External Interface Requirements

3.1 User Interfaces

The product will consist of a web-application with which the user will interact. The Students, Faculty Members, Library Clerks and Librarian [Admin] have different interfaces based on their functionalities and will be accessible by using their login credentials leading them to their respective user interfaces.

- **Homepage**
  - **Section 1 (Home)**
    - Navigation Bar
    - Login
      - Registration (if user is new to LIS)
  - **Section 2 (About Library)**
    Divisions showing up various facilities of Library
  - **Section 3 (Gallery)**
    Carousel of snaps of Library
  - **Section 4 (Contact)**

- **Student**
  - **Section 1 (Profile)**
    - Displays username, Full name, Institute Id, Department, Category (UG/PG/RS), Email Id, Mobile Number
    - Has option to update the above details
  - **Section 2 (Status of Books Issued)**
    - Displays the table consisting of all the books issued till date along with their expiry date and overdue penalty if any
    - Has option to update the above details
  - **Section 3 (Issuing new Books)**
    - Has a search bar to find designated books
    - Search bar has a filter which can function as a category wise search
    - Has an issue option to add books into Section 2 provided the user has not exceeded the limit of maximum number of books issued.
- **Faculty**
  - **Section 1 (Profile)**
    - Displays username, Full name, Institute Id, Department, Email Id, Mobile Number
    - Has option to update the above details
  - **Section 2 (Status of Books Issued)**
    - Displays the table consisting of all the books issued till date along with their expiry date and overdue penalty if any
    - Has option to update the above details
  - **Section 3 (Issuing new Books)**
    - Has a search bar to find designated books
    - Search bar has a filter which can function as a category wise search

- Has an issue option to add books into Section 2 provided the user has not exceeded the limit of maximum number of books issued.

- **Library Clerk**
  - **Section 1 (Profile)**
    - Displays username, Full name, Institute Id, Email Id, Mobile Number
    - Has option to update the above details
  - **Section 2 (Update Books Database)**
    - Has option to add new books with all details
    - Has option to Edit or Remove the book details
- **Librarian (Admin)**
  - **Section 1**

    -Displays all the User details along with the options to Add new user, Edit or Remove Existing Users

    -Displays all the Books details along with the options to Add new books, Edit or Remove Existing Books

3.2 Hardware Interfaces

The hardware interfaces for the online portal are listed below:

- The portal can be used on any platform or PC which has a proper internet connection.
- Compatible web browser is required to avoid any problems.

3.3 Software Interfaces

The Software interfaces for the project are listed below:

- The Project will connect to Bootstrap 5 for Front-End Responsive Pages and SQLite3 Cloud Database.
- The project is a web app and thus requires a working internet connection and a web browser only and is operating system independent.
- The Project uses Django Framework in the server side and Django HTML and CSS with Bootstrap in the client side. All the data coming from client side will be stored in an online SQLite3 Cloud Database

3.4 Communications Interfaces

All the communications will be done via the web-browser with the standard HTTP protocol.

4 System Features

4.1 Register a Student/Faculty

- **Description**
  – Getting on the platform requires the user to log in to the specific profile. Different profiles have different features. This task is very important to access the all the features of a class
- **Stimulus/Response Sequence**
  – For Registering, Users will be asked to provide specific information to make the profile.
- **Functional Requirements**
  – **Register**: As soon as the user enters they will see a general home page and there will be a link to go to the register page. There the user will enter the details in the respective boxes. After the details are authenticated/stored the user will be directed to the respective user page.
  – **Login**: Users will enter the credentials, created during the register process and then after authentication, they will be redirected to the respective user page

4.2 Profile

- **Description**
  – Users can see their profile and possibly edit their location.
- **Stimulus/Response Sequence**
  – Content of the profile will be shown here.
  – Edit button is available to edit location
  – Logout button is also provided to log user out
- **Functional Requirements**
  – This requires the use of some common Bootstrap framework to display buttons.

4.3 Books Database Access

- **Description**
  – Every Student/Faculty members' page contains a search bar to search for available books. The search bar also contains a filter which can function as a category wise search
- **Stimulus/Response Sequence**
  – Students and Faculty Members can view all the books available, and can issue books provided the user has not exceeded the limit of maximum number of books issued.
  – Members are allowed to reserve books which have been issued out. When such a reserved book is returned, LIS should print a slip for the concerned member to get the book issued and should disallow the issue of the book to any other member for a period of seven days or until the member who has reserved the book gets it issued.
  – Library clerks and the Librarian can add, edit or remove books from database
- **Functional Requirements**

- This requires SQLite3 database to store the large database of 10000 books and also requires python-framework Django to implement search, view, issue, add, edit or remove functionalities
- This also requires the use of some common Bootstrap framework and HTML, CSS, JS to display interfaces.

4.4 Users Database Access

- **Description**
  - Every Student/Faculty members' page contains a profile section along with list of issued books, expiry date of issued books, overdue penalty if any, System Notifications (such as reminder message to notify the user that previously reserved book is now available), also a search bar containing a filter which can function as a category wise search to search the book database
- **Stimulus/Response Sequence**
  - UG Students can issue only up to 2 books for 1-month duration. Else system generates a warning message
  - PG Students can issue only up to 4 books for 1-month duration. Else system generates a warning message
  - RS Students can issue only up to 6 books for a 3-month duration. Else system generates a warning message
  - Faculty Members can issue only up to 10 books for a 6-month duration. Else system generates a warning message
  - LIS registers each book issued to a member. When a member returns a book, LIS deletes the book from the member's account and makes the book available for future issue.
- **Functional Requirements**
  - This requires SQLite3 database to store the large database of users and also requires python-framework Django to implement search, view, issue, add, edit or remove functionalities
  - This also requires the use of some common Bootstrap framework and HTML, CSS, JS to display interfaces.

4.5 Admin (Librarian)

- **Description**
  - Has control over whole users and books databases
- **Stimulus/Response Sequence**
  - Admin has restricted access through special authentication and can do any functionality manually himself.
- **Functional Requirements**
  - This requires default built in Django administration page available in the Django framework

5 Other Non-functional Requirements

5.1 Performance Requirements

The user should be able to query databases quickly and the results fetched must be appropriate. This can be done by finding the right balance between performance and accuracy by using SQLite3.

5.2 Safety Requirements

The application runs on the web browser and hence harm to the user device is minimal, whereas a lot of data is to be read and written and hence the data storage and the server damage is possible but that too during heavy usage.

5.3 Security Requirements

The portal exchanges many critical documents between the users hence there is a multitude of safety requirements:

- A secure Login and Password for the users.
- A secured database system so that private information cannot be accessed by other people. Different storage spaces for the users so there is no information exchange between the users unwillingly

5.4 Business Rules

The software should not be outsourced to any third p

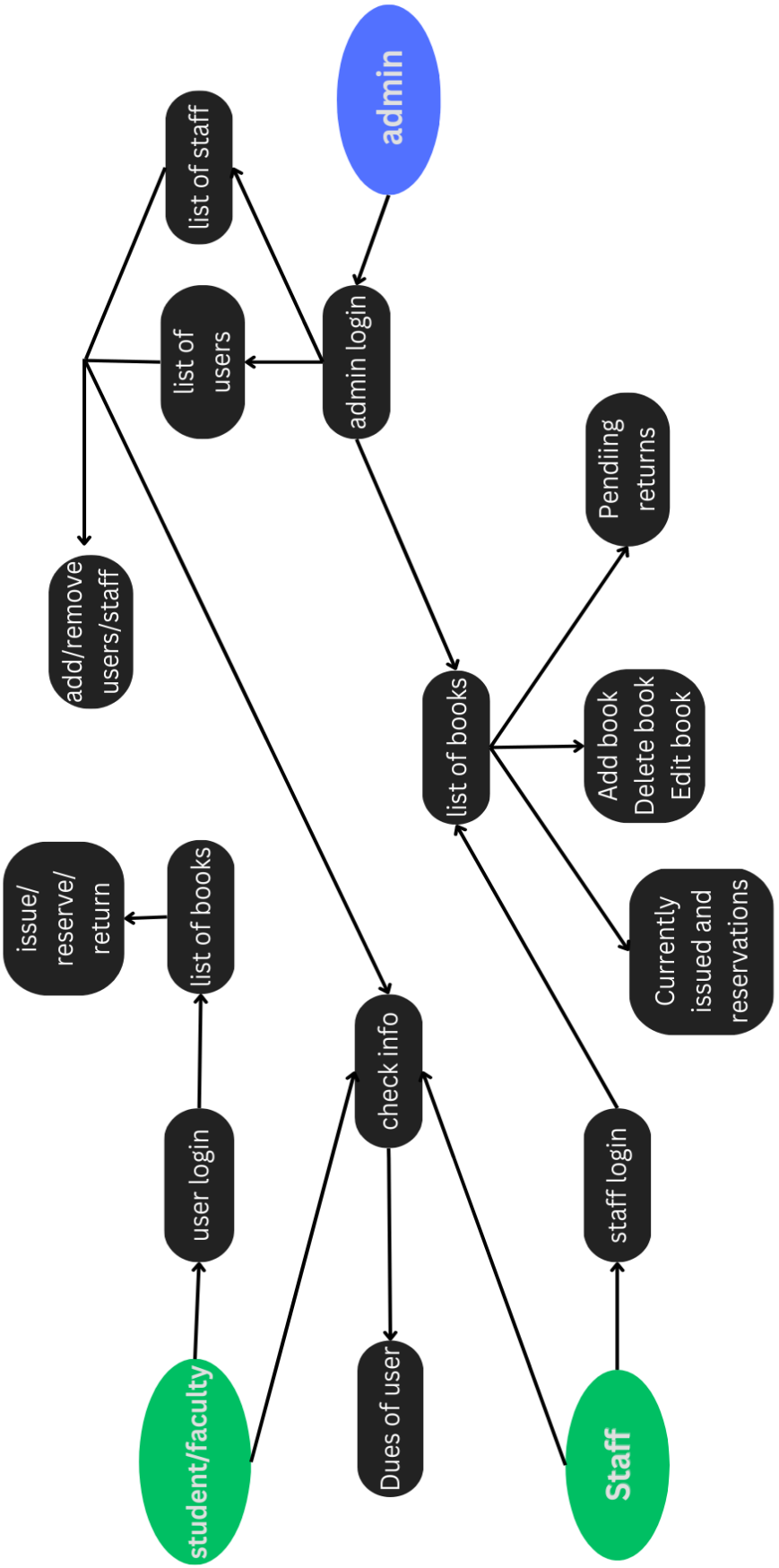
6 Other Requirements

- Securely store the data and backup server to prevent any server crashes.
- A server capable of handling heavy workload and queries.
- Licensing requirements: Applicable.

6.1 Appendix A: Glossary

- Django: A python back-end framework for web development.
- HTML, CSS, JavaScript: the three main languages we use to build website frontends
- SQLite3: C-based library that allows applications to store and retrieve data from local files on devices via a SQL interface.

6.2 Appendix B: Analysis Models



Use Case Diagram

Class Diagram