Software Requirements Specification

For

Online Library Management System

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Date: 10/05/2021

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1.Introduction

The introduction of the Software Requirements Specification (SRS) provides an overview of the entire SRS with purpose, scope, definitions, acronyms, abbreviations, references and overview of the SRS. The aim of this document is to gather and analyze and give an in-depth insight of the complete Online Library Management System by defining the problem statement in detail. The detailed requirements of the Online Library Management System are provided in this document.

1.1. Purpose

The purpose of this project is to provide a friendly environment to maintain the details of books and library members. The main purpose of this project is to maintain easy circulation system using computers and to provide different reports. The Library System is a package to be used by Libraries to improve the efficiency of Librarians, Library employees and Users. The system provides books catalogue and information to members and helps them decide on the books to borrow from the library. The Librarian can keep the books catalogue updated all the time so that the members get the updated information all the time.

1.2. Project Scope

Online Library Management System is basically updating the manual library system into an internet-based application so that the users can know the details of their accounts, availability of books and remaining time for borrowing. The project is specifically designed for the use of librarians and library users.

This system will work as a complete user interface for library management process and library usage from ordinary users. OLMS can be used by any existing or new library to manage its books and book borrowing, insertion and monitoring.

Any educational institute and other organization can make use of it for providing information about author, content of the available books. The project can further be extended by adding the faculty of e-books. To overcome the problem of book stock in library.

1.3. Glossary

This subsection contains definitions of all the terms, acronyms, and abbreviations used in the document. Terms and concepts from the application domain are defined.

- SRS – Software Requirement Specifications
- UI – User Interface
- SDLC – Software Development Life Cycle
- GUI – Graphical User Interface
- API – Application Programming Interface

1.4. References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998

1.5. Overview

Online library management is a project that manages and stores books information electronically according to student's needs. It is all about organizing, managing the library and library-oriented tasks. The system helps both students and library manager to keep a constant track of all the books available in the library. It allows both the admin and the student to search for the desired book. It becomes necessary for any library to keep a continuous check on the books issued and returned and even calculate fine. This task if carried out manually will be tedious and includes chances of mistakes. These errors are avoided by allowing the system to keep track of information such as issue date, last date to return the book and even fine information and thus there is no need to keep manual track of this information which thereby avoids chances of mistakes. Thus this system reduces manual work to a great extent allows smooth flow of library activities by removing chances of errors in the details.

The project Library Management System aims at developing a fully functional computerized system to maintain all the day to day activity of a library.

This project has many features which such as the facility of user login. There is an admin who will be managing the entire application's authorization and authentication, not any intruder can login and modify the data, as a login for admin is also available.

It has a facility of admin login through which the admin can monitor the whole system. It has a facility where student after logging in their accounts can see list of books issued and its issue date return date and see fine.

Overall, this project of ours is being developed to help the staff of library to maintain the library in the best way possible and also reduce the human efforts.

2. User Classes and Characteristics:

There are two types of stakeholders in our project, such as:

1. Admin:

An admin is primary actor in our project. In our project the admin has unique user name and password. He is responsible for full system. An admin decides authentication and authorization for all the different users of the application. He can register user, update books, issue books and others library oriented tasks. He can also maintain books in a stack, means record the availability at regular time interval.

2. Student:

Students are also primary actor in our project. For login this system a student should register their account. They can sign up with user name, email address and others information. A student can search books, issue books, see return books date, see his own dashboard and also see his fine.

3. Design and Implementation

Constraints Design and implementation constraints are those that we have used to implement this project make successful. It also describes tool that enables developers and testers to view and interact with the user interface (UI) elements of this application.

3.1 User Interface Technology
User interface (UI) is everything designed into a system view that which person's associates with this system may like the interface of this system.

3.1.1 Hardware Interface
Operating system: windows

Hard disk: 1TB

RAM: 4GB

Processor: intel(R) core-i5-CPU

3.1.2 Software Interface
Language : Php

Text editor : Sublime text

Database : MySQL

3.2 Implemented Tools and Platform
Every business plan, campaign, or project comes down to Tactics, Tools, and Strategies. To conceive, develop, and implement a sound social media marketing strategic plan that will be successful needs to have those three critical components.

3.2.1 Web Server
A Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their computers' HTTP clients. Dedicated computers and appliances may be referred to as Web servers as well. We will use the xampp server to implement this project.

3.2.2 Database Server
We will use MySQL database server to store all of the information of this system. The reason behind to choose the database server are given below:

1. Data Security
2. High performance
3. Reporting and Data Mining
4. Complete workflow control
5. Reduce total cost of ownership

4. Requirement Specification

The complete requirement specification based on the elicitation process is described in this section.

4.1 Functional Requirements:

Functional requirements refer to the functions which are mandatory to the system. Functional requirements must be able to perform on the software system. Every system must have some functional requirements. Now, we are going to mention functional requirements associating with our project.

4.1.1 New admin and student registered their account

FRequirement 1	New admin and student registered their account
Description	In our system there are two types of library users. But we assume our user is students. So, students should provide their valid information for registration and admin that means librarian check validate this information. If these information is correct then librarian approve the registration and account registration is successful. This process is also followed by new admin. If an old admin approves new admin then the new admin completes his/her registration process.
Stakeholder	Admin,Student
Priority	High

4.1.2 Admin and student user view their dashboard

FRequirement 2	Admin and student view their dashboard
Description	After login successfully admin and student view their dashboard. In admin's dashboard add/delete books, book request, issue details, registered students and other information will be showed. In student's dashboard issue book, book list, account, fine will showed.
Stakeholders	Admin,Student
Priority	High

4.1.3 Admin and student can edit their profile

FRequirement 3	Admin and student can edit their profile
Description	In this system admin and student can edit their username, password and other information. If they want to edit their profile first they should login the system and they should go to their profile and then they can update their profile.
Stakeholders	Admin,Student
Priority	High

4.1.4 Admin add books

FRequirement 4	Admin add books
Description	In this system, admin is a primary actor and he/she can add new books. He/she first login the system and then add new book and status as this book is available or unavailable.
Stakeholder	Admin
Priority	High

4.1.5 Admin delete books

FRequirement 5	Admin delete books
Description	In this system, admin can delete a book. He/she enter book's ISBN number and then delete the book.
Stakeholder	Admin
Priority	High

4.1.6 Admin issue new book and update details

Requirement 6	Admin issue new book and update details
Description	If a student sends book request, then student check this book is available or not. If this book is available accept book request and issue this book. Then finally admin update the book details.
Stakeholder	Admin
Priority	High

4.1.7 Student view issue book and return date

FRequirement 7	Student view issue book and return date
Description	A student can view book request is accepting or not and then view issue information that means see when he/she accept the book and when he/she give book to Admin. That means we see a student can see his/her issue date and return date.
Stakeholder	Student
Priority	High

4.1.8 Admin can approve book request

FRequirement 8	Admin can approve book request
Description	When a student send book request then admin approve the book request and automatic update book's quantity.
Stakeholder	Admin
Priority	High

4.1.9 Admin can search student

FRequirement 9	Admin can search student
Description	Admin can see all student's information. If admin search a student for any purpose , he can use student ID for search a specific student and see his/ her information
Stakeholder	Admin
Priority	High

4.1.10 Student send book request by book's ISBN number

FRequirement 10	Student send book request by book's ISBN number
Description	In this system a student sends book request to issue a new book. He/she can search book by book's id and send the book request to admin.
Stakeholder	Student
Priority	High

4.1.11 Admin can see feedback

FRequirement 11	Admin can see feedback
Description	In this system we add an amazing feature that is feedback. Admin can see the feedback of the system. That means an admin only see the feedback of our system but not give any reply.
Stakeholder	Admin
Priority	Medium

4.1.12 Student can give feedback and also see other's feedback

FRequirement 12	Student can give feedback and also see other's feedback
Description	We already say this feedback feature is amazing. As an user he/she can give feedback about this system and also see other's person feedback.
Stakeholder	Student
Priority	Medium

4.1.13 Admin charge fine send notification to give fine

FRequirement 13	Admin charge fine and send notification to give fine
Description	If a student cannot return book in time, then librarian charge fine. Admin then send notification to give this fine as a student can remember that he/she should return the book.
Stakeholder	Admin,Student
Priority	High

4.1.14 Student see their expired date and notified fine

FRequirement 14	Student see their expired date and notified fine
Description	A student can issue book bye send book request. He/she can see issue date and expired date of book and if admin send mail to give fine then a student see mail about fine.
Stakeholder	Student
Priority	High

4.1.15 Admin and student can recover their password

FRequirement 15	Admin and student can recover their password
Description	In this system librarian and a student can login by their user name and password. If they forget their password they can recover password by click forget password and then get e link in their mail to recover the password.
Stakeholder	Admin,student
Priority	High

4.1.16 Admin and student can see book list

FRequirement 16	Admin and student can see book list
Description	Admin and student can see book list. Librarian see the book list as he/she can see which books should add in the list. A student should see the book list as he/she can see which books are available and which are unavailable.
Stakeholder	Admin, student
Priority	High

4.1.17 Admin can see student's details

FRequirement 17	Admin can see student's details
Description	An admin can see all student's details. First he/she need to login this system and then he/she can see all registered student's details.
Stakeholder	Admin
Priority	High

4.1.18 Admin can approve new admin

FRequirement 18	Admin can approve new admin
Description	In a library there can be join new admin. So new admin should register the system. An existence admin can validate the new admin's information and approve the registration.
Stakeholder	Admin
Priority	High

4.1.19 Admin and student can search book

FRequirement 19	Admin and student can search book
Description	In this system library user search book by select department and book id. Librarian also search book in this way to see that desirable book is available or not.
Stakeholder	Admin,student
Priority	High

4.1.20 Student verify their email address

FRequirement 20	Student verify their email address
Description	When a student registration his/her account he/she should give email address and an otp is given in email. When he/she give right otp then his/her email address will be verified.
Stakeholder	Student
Priority	High

4.1.21 Admin can add and delete announcement

FRequirement 21	Admin can add and delete announcement
Description	If any notice want to inform students then admin can add new announcement and if he/she wants to the notice is not to need inform now then delete an announcement.
Stakeholder	Admin
Priority	High

4.1.22 Student can see announcement

FRequirement 22	Student can see announcement
Description	If an admin add any notice then a student can see this.
Stakeholder	Student
Priority	High

4.2 Data Requirements

For defining data requirements, we need to build the model. For our application maximum data would be loaded from remote user. And for that purpose we need to focus on some major points.

Such as:

- Types of entity of the system
- Route data locations
- Capacity and resources of the data requirements
- Data source sequence
- Data availability schedules
- Quantity of data
- Availability of data

4.3 Performance Requirements

It is very important to maintain performance of any software system. To ensure performance, we need to maintain some steps. Now, I will explain some perspective by which we are going to enhance the performance of our project.

4.3.1 Speed & Latency Requirements
Speed and latency requirements must be ensured while retrieving data from the cloud server

SLR-1	Book request must be faster
Description	When a student send a book request it must be send an admin faster.
stakeholders	Students

SLR-2	Approve books request must be faster
Description	When a student send book request then approve request must be faster.
stakeholders	Admin

4.3.2 Precision & Accuracy Requirements
Results that is to be shown to the end user is need to be accurate. Because, wrong information might be ruined the whole business process.

PAR-1	Submitting otp must be accurate
Description	When a student registration in the system an otp is send to his/her email. He/she should give accurate otp otherwise he/she can not complete his/her registration.
Stakeholders	Student

4.3.3 Capacity Requirements
The developed system by us must be capable to handle user data, provide accurate information, handling database, manage http request etc.

CR-1	The system will handle thousands of data
Description	The system need to handle data thousands of data every moment.
Stakeholders	Admin

4.4 Dependability Requirements

The term dependability is measured based on four dimensions. Such as:

- Availability
- Reliability
- Safety
- Security

If we want to say that our application system is dependable then it must fulfil the four dimensions. But there are other tasks. Like there is no way to make mistakes or our system should have the ability to detect and then remove errors. Besides that, it is also very important to limit the damage which might be caused by system failure.

4.4.1 Reliability & Availability Requirements

Now, I will mention requirements which is related to reliability and availability

RAR-1	**The system must be available on 24 X 7**
Description	Our system must be available all day long, every day in a week • The system must be updated regularly • System must be malware free
Stakeholders	Admin

4.4.2 Robustness or Fault-Tolerance Requirements

To ensure robustness and fault-tolerance facilities to the end users, it is urgent to ensure 0% crush. Moreover, it must show accurate results.

RFT-1	**The system handles all user access without system errors**
Description	Thousands of user might hit our application system at a time. All their requests must be handled without any fault
Stakeholders	N/A

4.4.3 Safety-Critical Requirements
There are no safety-critical requirements in our project.

4.5 Maintainability & Supportability Requirements

It is very important to provide after service or support to the end users.

MR-1	**System helps to update user and admin profile**
Description	It is very important to update user and admin profile.
Stakeholders	N/A

4.5.2 Supportability Requirements

Supportability requirements may have related to some extends. Like:

- Testability
- Extensibility
- Adaptability
- Maintainability
- Compatibility
- Configurability
- Serviceability
- Install ability

Our application meets all of the above requirements related to supportability.

4.5.3 Adaptability Requirements
There are no adaptability requirements in our system software.

4.6 Security Requirements

Making software security as a requirement is very important. Software security requirements should be its functional requirement. Software security enforces security of an application system.

Functionality related to software security can either be directly tested or observed. Some security related requirements is given below:

- Signing in a student and admin
- Get access according to logged in user
- Submitting otp code Signing in as a student
- Handling encrypted passwords

While accessing to the system, each and every module must provide a central authentication mechanism. There is also a process to prevent entering into the system by ensuring hashed password for the unauthenticated users.

4.6.1 Access Requirements
 For accessing to our application system, there remains some authentication and authorization techniques. And every module of our system will provide it. Now I will provide an explanation below.

AR-1	Application provides security mechanism
Description	Every module is designed in such a way that it only give access to the authorized and authenticated users.
Stakeholders	Admin,student

4.6.2 Integrity Requirements

Integrity requirements refers to a security system which ensures an expectation of data quality. It also ensures that all data of the system would never be exposed to the malicious modification. or accidental destruction. For that reason, we will store our user passwords as encrypted format which is impossible to decrypt. It is also called hashed password.

4.6.3 Privacy Requirements

It is very important to ensure privacy of the system users. Privacy requirements enhances to protect stakeholder's privacy. In this way, all data or a partial part of data are going to be disclosed according to system's privacy policy. To ensure privacy, the central database should be protected by the anonymous. Users are permitted to get access to those data which are being associated by them which can be ensured by the user log in system.

4.7 Usability and Human-Interaction Requirements

The main target of developing any system is to make the system user friendly and easy to usable for the end users.

4.7.1 Ease of Use Requirements

Our application is easy to use and also easily understandable.

EUR-1	Application must be usable for the end user
Description	This app is enough usable to the admin by which they can operate this system easily.
stakeholders	Students,Admin

4.7.2 Personalization and Internationalization Requirements

There are not any personalization and internationalization requirements to our system. This maiden version of our application is only be operated by Bangladesh.

4.7.3 Understand ability and Politeness Requirements

It is already said that the application which we are going to develop, is understandable enough. The system provides hints to users whether any error occurred or wrong. By reading those errors users can be able to operate the system easily.

4.7.4 Accessibility Requirements
There are no specific accessibility requirements associated to our system yet.

4.7.5 User Documentation Requirements
Documentation are mainly two types. One is internal documentation which is generally written by the application engineers. It is prepared to make development life cycle easier for the system engineers or system analysts.

UDR-1	The system engineer documentation
Description	To develop our application named smart citizen, safe journey, firstly we have make a system analysis team as well as documentation team.
Stakeholders	System analysts or software developer

4.7.6 Training Requirements
Training requirements involved in after service of any application. It is very necessary to properly train up end users to the system so that they would be capable to operate easily. After launching the full package to the market, firstly we provide training to the different end users like admin,student.

4.8 Look and Feel Requirements

Look and feel requirements mainly refers how the system will look like and how the user interface or graphical user interface of our system will display to the user.

4.8.1 Appearance Requirements
Admin and all other user must know which input fields are required and which are not. For that reason, we will use labels for all input fields. Input fields might be text type, radio, checkbox, spinner etc.

AR-1	Labels of mandatory fields must be bold
Description	The mandatory field's label must be bold and all input fields must have placeholder to make it easier for the users.
Stakeholders	Admin and Any other end user

4.8.2 Style Requirements
After keeping all contents, it is very essential to load stylesheet to the application. For web application, css is used. Style makes the system lucrative.

SR-1	The appearance must be controllable using stylesheet file
Description	For web application stylesheet files are css. So, all stylesheet must be controllable by the css file.

Stakeholders	Software developer

4.9 Operational and Environmental Requirements

Operational and environmental requirement refers to the capabilities, performance measurements, process, measurements of effectiveness, measurements of performance, measures of sustainability, measurements of technical performances etc.

4.9.1 Expected Physical Requirements
There are no expected physical requirements in our system.

4.9.2 Requirements for Interfacing with Adjacent Systems
There are no requirements for interfacing with adjacent system for our project.

4.9.3 Release Requirements
There are no specific release requirements in our system.

4.10 Legal Requirements

Legal requirements normally refer to the terms and conditions or privacy policy of any organizations. The terms and condition of our application is that, no third party software or person are allowed to engage to use our data for their business purpose.

4.10.1 Compliance Requirements
There are no specific compliance requirements for our system.

4.10.2 Standards Requirements
There are no specific standards requirements for our system

5. Requirement Engineering Process

Requirements engineering refers to the process of defining, documenting and maintaining requirements in the engineering design process. It is a common role in systems engineering and software engineering.

5.1 Requirement Elicitation Techniques
Requirement elicitation is the process of collecting and refining stakeholder's requirements. Projects are garbage-in-garbage-out meaning that poor quality requirements typically lead to project issues and failure.

5.1.1 Hold Elicitation Interviews
We hold interviews that can be performed one-on-one or with a small group of stakeholders. They are an effective way to elicit requirements without taking too much stakeholder time because we meet with people to discuss only the specific requirements that are important to this system. Interviews are helpful to separately elicit requirements from members in preparation for workshops where those members of this system come together to resolve any conflicts.

5.1.2 Perform Document Analysis
Existing documentation can help reveal how systems currently work or what they are supposed to do. Documentation includes any written information about current systems, business processes, requirements

specifications, competitor research. Reviewing and analyzing the documents can help identify functionality that needs to remain, functionality that isn't used.

5.1.3 Distribute Questionnaires
We conduct a survey to collect requirements for this system. Questionnaires are a way to survey large groups of users to determine what they need. Questionnaires are useful with any large user population but are particularly helpful with distributed groups.

6. Conclusion

The Online library management system to be developed benefits greatly the members and the librarian institute. The librarian can keep the books catalog updated all the time so that the member get the information all the time. It is more useful for all educational institutions. We hope this application can be implemented our campus and become a popular project in every campus.

Appendix

We've prioritized the functional requirements by following **Three-level Scale technique**.

Three-level Scale: When a BA categorizes the requirements in any of the ordering or ranking scale, it is subject to the analyst's understanding of the business. Many analysts suggest that this method has some drawbacks and advocate methods that have more than one scale.

Covey, Rebecca and Merrill would have never in their wildest dreams have thought that their **"The four-quadrant 'Eisenhower Decision Matrix'** for importance and urgency"**, from their self-help book First things First, would become one of the most widely used prioritization techniques in the IT space.
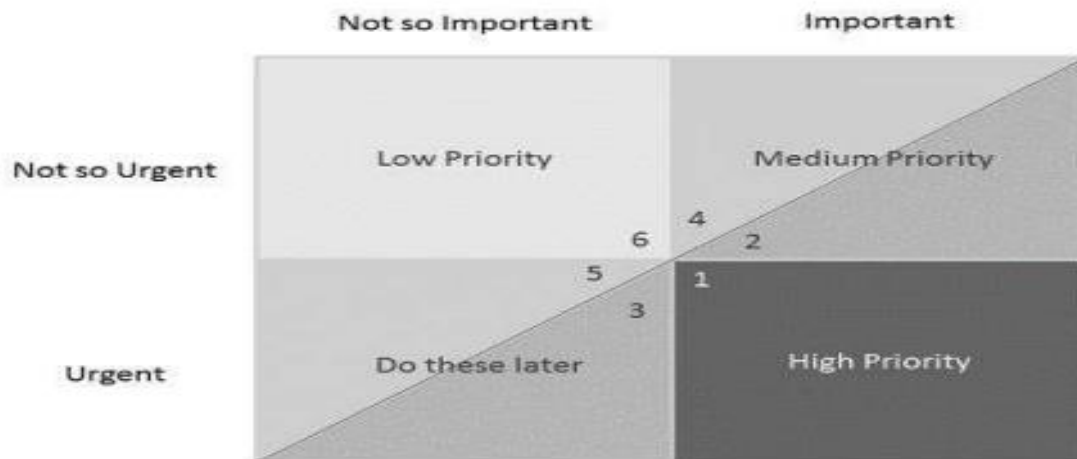

Figure 2: Eisenhower Decision Matrix — Lower the number, higher the priority of the section

With the numbering on the different sections of the diagram, the priority of the sections is implicit. Important items have the highest preference, while urgent items have lower preference.

1. High Priority – These requirements are urgent and important. These are requirements that are generally with respect to compliance or contract that cannot be left out. These requirements need to be implemented in the current release and not implementing the same will have some adverse effect on the business.

2. Medium Priority – These requirements are important but not as urgent. Implement these after you implement the high priority items. If you see closely there is a line that splits this quadrant into 2 parts. Implement the items that are on the right side of the line first as they are relatively of higher medium priority.

3. Do these later – These items are urgent but do not have a lot of effect on the business. Hence do it after completing the more important medium priority items. Similar to the medium priority items, this quadrant

has also been split into two; the items on the right side have a higher priority relatively to the items on the left.

 4. Low Priority – These items are neither important nor are they urgent. Complete the items at your leisure after completing the items in sections 4 and 5 respectively.

The items on the right-hand side of the diagonal have higher priority. Start with the bottom-right corner of the high-priority quadrant and work your way up and left.

THE END