Library Management System

Software Requirement Specification

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1 INTRODUCTION

1.1 General System Definition

The Library Management System is the tool for organizing, managing, monitoring and controlling the transactions of books in the library.

1.2 Purpose

The Library management system SRS main goal is to provide the view of working of the system and expectations by the end user. It provides the cost analysis to show how much budget is required to build and complete the project within the time constraint, analysis of requirements such as functional and nonfunctional requirements to provide the development team with detailed understanding of the system and design with flow of the library management system.

1.3 Scope of the Project

Library consists of thousands of books, and with the increase in the number of readers it needs to be well organized. So, LMS obligation is to provide the facility of organization of books, monitoring them and controlling the transactions. It maintains the details of books and members. It provides the ease of searching the available books in the library. It provides the functionality of reserving the books and adding new books. Our Library Management System will have two end users: Librarian and Members. Librarian will be able to check member's details, check in or check out books from the library, manage the books. Members would be able to view their account, check for their details such as list of books borrowed, view the due date, and view the payment history.

The main objective of this LMS software is to simplify day to day process of library. It will be able to provide quick and efficient service in a quick manner. This system will be able to remove the drawbacks of large customer information physical files and catalog which were tough to manage. Secure Transaction, quick retrieval of information, ease of use, quick recovery of errors, fault tolerance are some of the benefits that development team will be working on to achieve end user satisfaction.

1.4 Definitions, Acronyms and abbreviations

SRS Software Requirement Specifications

LMS Library Management System

FR Functional Requirement

NFR Non-Functional Requirement

CEO Chief Executive Officer

IT Information Technology

ROI Return On Investment: Measurement of profit or loss generated from the investment.

NPV Net Present Value: It's the difference between present value of cash inflows and present value of cash outflows.

BEP Break Even Point: It's point of production where total revenue equals total expenses.

1.5 Overview of the Document

The remainder section of this SRS document provides the System Planning, Overall Description, Specific Requirements, Use Case Analysis, Process Model, Data Model and System Design of the product. System Planning consists of system request of business plan, feasibility analysis and work plan. Overall Description includes Product Functions, User Characteristics, and General Constraints. Specific Requirements consists of Functional Requirements, Non Functional Requirements, UI Interface Requirement, Communication Interface Requirement, Hardware and Software Specifications. Then, Use Case Analysis provides with 10 use cases. Process Model gives us Context Level Diagram, Level 0 DFD, and Level 1 DFD. Data Model provides entity relationship diagram with constraints. System Design consists of System Architecture, and User Interface Design. Then Follows the Appendix Section.

2 Overall Descriptions

2.1 Product Functions

There will be two different users who can use this product in different way:

a) Librarian

- Librarian will have access to any information and main control.
- Librarian can add, modify or delete resource
- Librarian can register new members
- Librarian can check in check out resources.
- Librarian has control to payment system.

b) Registered Members

- Member can search the availability of needed resources
- Members can renew their resource
- Members can view their membership information, rental history information, payment information, due dates…etc. from online.

2.2 User Characteristics

There are 2 users in our LMS product:

a) **Librarian:** They have administrator control over their portion of library system. They can access any of their member's information. They can manage the resource and perform operation on resource such as adding, removing or modifying the resource information that are in library database server. They checks in/checks out resource for members. Librarian are expected to have basic knowledge of on how to use computer system/software. They need to take a week training on how to use LMS.

b) **Registered Members:** Users are supposed to be registered first in the LMS and pay the membership fee to be registered member of the library. Then, they will have access to library resources. They can search for the available resources. They can also view the account with the information such as rental history, due dates, payment information, and membership information. Members are at least required to know how to use the LMS software.

2.3 General Constraints

1. Storage Constraint: Every Library subscribed to LMS will have 20 GB of Cloud Storage allocated.

2. High Level Language Requirement: Software should be in English language.

3. Reliability Constraint: System should be updated to backup server frequently in order to provide fault tolerance capability.

4. Implementation Constraints: Implementation of application should be in C#.

3 Specific Requirements

3.1 Functional Requirements

3.1.1 Members

3.1.1.1 Logging In

FR1. The System shall verify valid ID and Password.

FR2. The System shall not allow to enter the system with invalid ID or Password

FR3. The System shall allow member to enter with valid ID and Password

3.1.1.2 Search

FR4. The System shall allow members to be able to search for available resource by title, Resource ID, Author Name.

FR5. The System shall display the search results with the details of preferred Resource.

3.1.1.3 Renew Resource

FR6. The System shall allow members to renew the resource within 72 hours before due date.

3.1.1.4 Manage/View Account

FR7. The System shall allow members to view history containing information such as list of resource rented, due date, renewal date, and status.

FR8. The System shall allow update their personal information such as phone number, address, email address, password.

3.1.1.5 Payment Management

FR9. The System shall display the due payment, description and deadline to the customer.

FR10. The System shall provide member payment facility that will store payment information and data.

FR11. The system shall collect and verify payment information made by member.

FR12. The System shall allow member to see their payment history containing information such as purpose, payment ID, date of payment.

3.1.2 Librarian

3.1.2.1 Admin Access

FR13. The System shall verify admin login info to provide all access privilege.

3.1.2.2 Register Members

FR14. The System shall store the registered id in the membership database.

3.1.2.3 Update Resource

FR15. The System shall allow add, delete or edit resource with their details such as resource id, resource name, description of resource, location, category and author.

3.1.2.4 Check In/Check Out

FR16. The System shall record the transaction details such as Resource ID, Member ID, Due

Date, Check out Date, Checked in Date, Status.

3.2 Non- Functional Requirements

3.2.1 Performance Requirements

NF1. Database should be updated within a second.

NF2. Search results should be displayed within a second.

NF3. User Interface shall not take more than 3 seconds to load.

NF4. Login should be validated within 2 seconds.

3.2.2 Security Requirements

NF5. Every external communication between data server and end user takes place through VPN.

NF6. Payment Information are protected and encrypted.

NF7. Payment transaction is done with HTTP over Secure Protocol.

3.2.3 Safety Requirements

NF8. In the event of failure, there should be another data server be on standby to provide fault tolerance capability.

3.2.4 Capacity Requirements

NF9. Not more than 10,000 members to be registered.

3.3 User Interface Requirement

The UI is loaded from the server to any web browser. So our UI is compatible to any browser such as Mozilla Firefox, Google Chrome, Safari, Internet Explorer etc. It also provide responsive design so it can be viewed or operated from the Mobile Browsers as well.

3.4 Communication Interface

We will be using HTTPS/HTTP protocol for the communication over the server.

3.5 Hardware and Software specification

- Android version 2.3 ginger bread(minimum, android user's)
- 2GB ram
- 1.2 GHz processor
- Intel P4/core-to-due/i3/i4/i5
- Windows 7/8/8.1/10

4 Use Case Analyses

Use Case Name: Register the member
Actor: Librarian
Preconditions: 1. The librarian collects required credentials and information to be registered as member.
Steps to Complete: 1. The librarian opens the membership database portal. 2. Fills Up the required information such as name, address, contact, ID of the member. 3. Submits the filled information to the registered member. 4. Server verifies and validate the filled information. 5. Librarians post the payment for the registered member. 6. Server verifies the authenticity of the payment for membership registration. 7. Server creates the profile for registered member.
Post conditions: Newly registered member is activated and fully unlocked to use LMS service.

Use Case Name: Add Books
Actor: Librarian

Preconditions: 1. The librarian collects required information of the book which comes in Library.
Steps to Complete: 1. The librarian opens the books record portal. 2. Fills Up the required information such as title, author, publisher. 3. Submits the filled information to the books record. 4. Server verifies and validate the filled information.
Post conditions: New book is available for the members.

Use Case Name: Issue Book
Actor: Librarian
Preconditions: 1. The request of book issuing should be come from the registered member.
Steps to Complete: 1. The librarian opens the issuing books portal. 2. Fills Up the required information such as member Id, name, contacts. 3. Update this books record as issued. 4. Server verifies and validates the filled information.
Post conditions: New this book is not available for the members.
Use Case Name: Search Book
Actor: Member
Preconditions: 1. The member should be registered.
Steps to Complete: 1. The member login the lms portal. 2. Write the title of the book in the search box. 4. Server gives all the information about the book if book record is exist.
Post conditions: New this book is not available for the members.

4.1 Use Case Diagram