Library Management System

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Submitted To:

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1 Acknowledgement

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2 Abstract

Library management system is a project which aims in developing a computerized system to maintain all the daily work of library .This project has features which are generally not available in normal library management systems like existing system does not have any facility to generate student reports as well as book issue reports where as proposed system provides it. It has also a facility to send an email to that particular student whose return book deadline crosses. We also generate the different charts which differentiate our project with existing Library systems. Overall this project of ours is being developed to help the users and librarian to maintain the library in the best way possible and also reduce the human efforts.

3 Introduction

The project Library Management System is developed in C-sharp, which mainly focuses on basic operations in library like adding new members, new books, and updating new information, searching books and members to borrow and return books. With the ever-increasing sea of information, this modern function of library is becoming very complex and tedious to handle manually. The librarian has to devote most of his/her time to handing such functions of library. So after conducting the feasibility study we decided to

make the manual Library management system to be computerized. We tried our best to make our project which shall provide user friendly interface

4 The Group

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5 The Client

The Client is an educational based institutional organization which is paying a team developer to create Library Management System for clients.

6 Description

This project fulfill the client requirements where this Library Management System can perform various functions like adding new members, new books, and updating new information, searching books or members to borrow or return books. This project can also full the client requirement to send email to those students whose deadline of return book is exceed. It can also show issuance chart and threshold chart for instant report. According to the user requirement the system should send email to the registered students whenever we add a new book to this system.

7 Objectives

The software Library Management System has major six objectives which are given below.

7.1 Insertion

Complete insertion of student data, books data and record of book issued or returned to/by particular in to database.

7.2 Extraction

Complete extraction of student data, books data and record of book issued or returned to/by particular from database.

7.3 Keep Record

Keeping all record of borrowed or issued books list, fine maintains and student and books details.

7.4 Searching

Searching Facility system, Search for books and members and other type of searches from database.

7.5 Charts Creation

This functionality enables the user (admin) to create issuance chart and threshold chart for instant report generation.

7.6 Sending Email To Registered Students

To fulfill the user requirement to send email to the students whenever a new book added or when deadline of book return crosses.

8 Benefits

This application is developed for handling multiple users at a time. Multiple users can run the application at a same time and perform the various options according to his/her choice. This application also provides a feature to check records of Books and Students. With the ever increasing sea of information, this is becoming very complex and tedious to handle manually and the librarian has to devote most of his/her time to handle it. So the main motive of this to project to lessen the human effort and save time.
o It provides "better and efficient" service to members.
o Reduce the workload of employee.
o Faster retrieval of information about the desired book.
o Provide facility for proper monitoring reduce paper work and provide data

security.
o All details will be available on a click.

9 Preliminary Requirement Analysis

9.1 Application Overview

9.1.1 User Roles and Responsibilities

User have many roles and responsibilities in this system some of important are given below.

9.1.2 Roles

o User (Admin) has to enter all data of students or register the students.
o User (Admin) has to enter all data of books or do books entry whenever new stock comes.
o User(Admin) has to maintain all the records of student and books both, means to say that to handle the record in order to how many student has issued the book with complete information of book and students.

9.1.3 Responsibilities

o It is user responsibility to issue the book for student when he/she wants.
o It is user responsibility to enter correct details during issuing and returning the book means to say that ensuring some important things like not to issue book when there is no book showing in book details.
o It is user responsibility create charts for the quick report generation.
o It is user responsibility to send email notification to fined students means to say that sending email if student did not returned book in time and he charged to pay fine.
o It is user responsibility to generate and send email to all registered students whenever a collection of book is added in this system.
o It is user responsibility to set threshold time of returning the book whenever a student issues the book.

10 Functionality Requirements

The System needs to fulfill the following functionality requirement:
o Our System shall provide sign-up and Log-in functionality to Admin.
o Our System shall provide a functionality of Fast response to different users.
o Our System shall provide a functionality of transition history to different user.
o Our System shall provide a functionality to change code of registered student.

The System needs to fulfill the following non-functional requirement:
o Our System must response up to 1-10 seconds.
o Our System must be secure as it provides login functionality to the different user.
o Our System must be capable of handling 20K register per seconds.
o Our System must be salable up to 50K request per seconds.
o Our System must be available 24/7 hours with the help of UPS or Generator.
o Our System must be recoverable and manageable in case of errors by recognizing error and keeping track of application stable version.
o Our System must be easy to understand for end-users.
o Our System must ensure data integrity for login and Sign-up functions.

11 Technical Requirement

o Server System is going to be running on a server. In this case, system itself is acting as server. System itself will provide service to clients. It will fulfill client's requests which are running on same computer and hence acts as a server itself.
o Database will be used to store and modify data of users and books. The group members will have access to database. They can add edit or delete tables. Group will be using free database online.

11.1 Scope

To utilize resources in an efficient manner by increasing their productivity through automation. There is a future scope of this facility that many more features such as online lectures video tutorials can be added by teachers as well as online assignments submission facility, a feature Of group chat where students can discuss various issues of engineering can be added to this project thus making it more interactive more user friendly and project which fulfills each users need in the best way possible. The different areas where we can use this application are.
o Any education institute can make use of it for providing information about author, content of the available books.
o It can be used in offices and modifications can be easily done according to requirements.

12 Process Followed

12.1 Software Development Approach

o The Project will follow the waterfall model as the requirements of the client are well defined and client knows exactly what they want, that's why waterfall model is best suitable for the system.
o A waterfall model allows the group to focus on the given task at a time and helps them to communicate through it, since the time frame is already known and plan of development is designed, a waterfall model will allow the developer to understand and develop better.

12.2 Outline Plan And Milestone

12.2.1 Milestone 1 (October 10, 2022): Feasibility Report

The group is going to submit and present the feasibility report of the project that is going to be conclusive and detailed about the requirements and problems risks of the project development.

12.2.2 Milestone 2 (October 24, 2022): Progress Report Meeting I

The group will present a progress report that tells the client what is done until now and how the flow is working out for the group.

12.2.3 Milestone 3 (November 21, 2022): Progress Report Meeting II

The group is going to submit and present the feasibility report of the project that is going to be conclusive and detailed about the requirements and problems risks of the project development.

12.2.4 Milestone 4 (December 19, 2022)

The project will be live as a working functional system and will be presented by the team and then handed over to the client.

12.3 Tools And Technology

o Operating System: Windows 10.
o Language: C-sharp.
o Database Management System: SQL.
o Software: Visual Studio 2022.
o RAM: 4 GB Or More.
o Hard Disk: 250 GB Or More.
o Processor: Intel Core Processor Or More.

13 Requirement Models

13.1 Scenarios

We will be designing Library Management system. The system will allow admin to log-In into the system. The system will allow admin to add data, delete data and update data of users and books and also view the list of users and books. The system will allow admin to issue books to users and each user can issue maximum three books. The system will allow admin to

check the returning of book from the relevant user in case of late then user has to pay fine. The system will allow admin to check the complete details of Issued and returned books.

13.2 Case Diagram

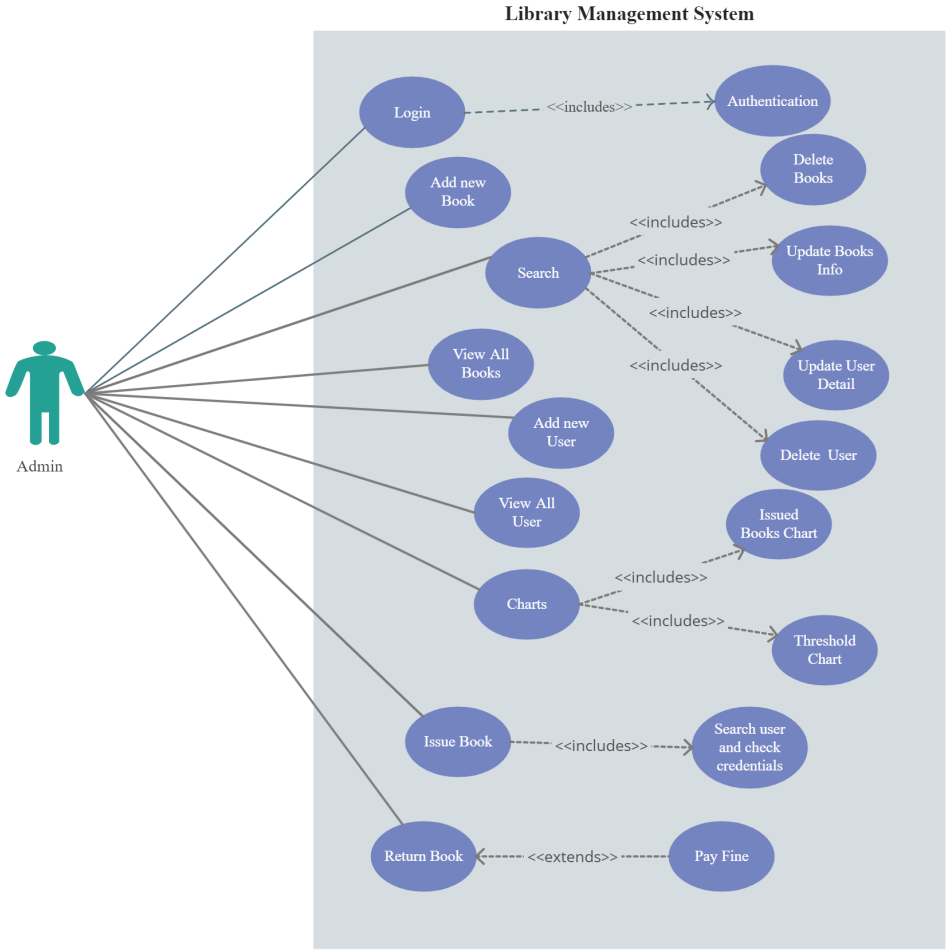

Figure 1: Case Diagram.

13.3 ERD Diagram

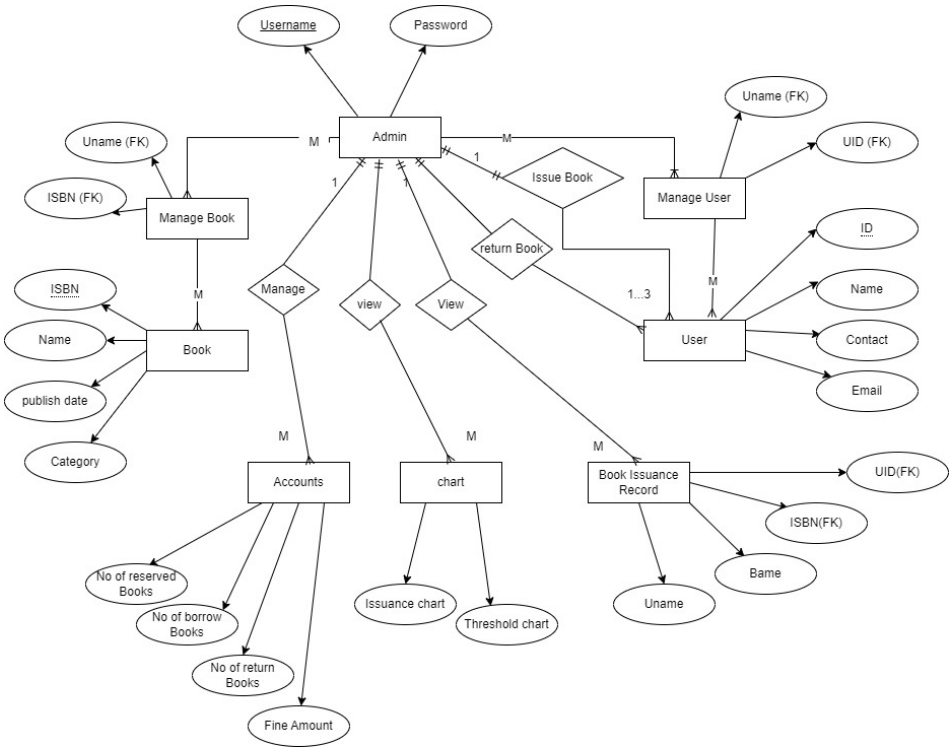

Figure 2: ERD.

13.4 Realtional Schema Diagram

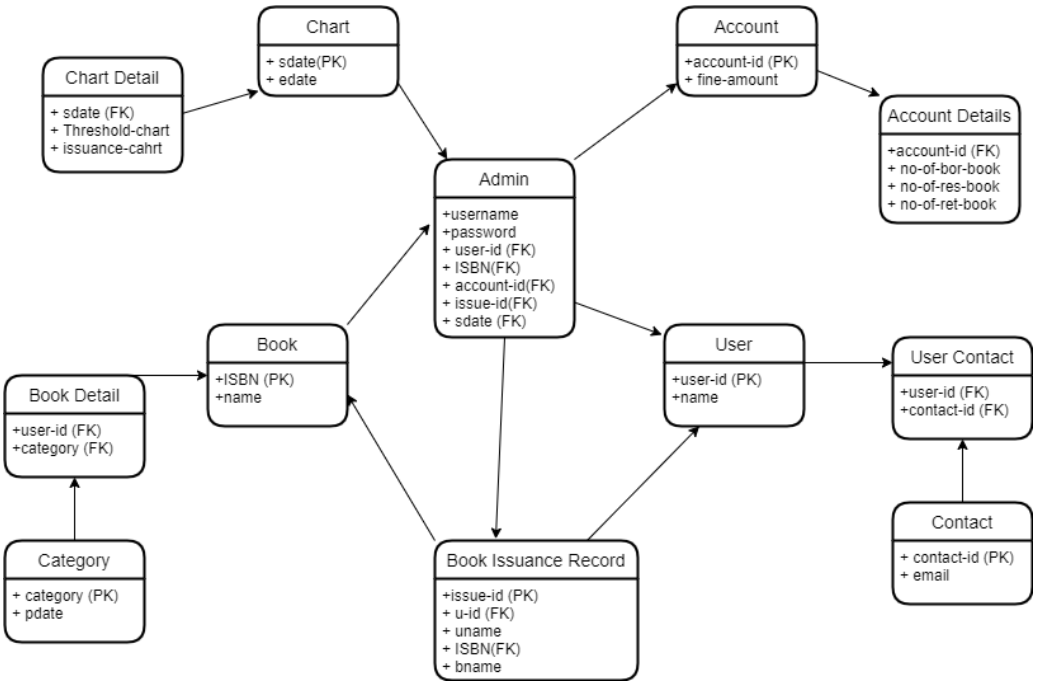

Figure 3: Relational Schema.

14 Testing Plan

The aim of the system testing process was to determine all defects in our project. The program was subjected to a set of test inputs and various observations were made and based on these observations it will be decided whether the program behaves as expected or not.

14.1 Testing Strategy

Our project went through two level of tastings.
o Unit Testing.
o Integration Testing.

14.2 Unit Testing

14.2.1 1 For Admin Module

14.2.2 Testing admin login form

This form is used for log in of administrator of the system. In this we enter the username and password if both are correct administration page will open other wise if any of data is wrong it will get redirected back to the login page and again ask for username and password.

14.2.3 Student account addition

In this section the admin can verify student details from student academic information and then only add student details to main library database it contains add and delete buttons if user click add button data will be added to student database and if he clicks delete button the student data will be deleted.

14.2.4 Book Addition

Admin can enter details of book and can add the details to the main book table also he can view the books details. Remember that whenever a new collection of book is added all registered student should receive the email that contains the information about new stock.

14.2.5 Issue Book

Admin can enter details of book and student then can grant maximum three books to each user. Student can reissue that book if he/she want to keep that book for more time.

14.2.6 Return Book

Admin can receive the book return by user. We apply different cases on it to make the module error free. Enter details of book and can add the details to the main book table also he can view the books details. For example if a student return the book then quantity of that book should be increase in library stock.

14.2.7 Fine

Admin can fine a student if he/she do not return book within time limit. And if student return the book within time limit then he will not be fined.

14.2.8 Sending Email

Admin can send email to any registered student. In this project student will receive email just because of two reasons first when student got some fine due to late in book return and the other one is when new book added to system then student will also get an email.

14.2.9 Creating Chart

Admin can create charts for quick report generation. There will be an issuance chart and a threshold chart which will show the complete detail of record.

14.3 Integration Testing

In this type of testing we test various integration of the project module by providing the input. The primary objective is to test the module interfaces in order to ensure that no errors are occurring when one module invokes the other module.

15 Conclusion

This Project provides a complete computerized version of library management system which will benefit the librarian as well as students of the institution. It changes entire manually process to one click computerized where admin can add student/book update student/book, can search any data, do book transactions. It also provides the charts. It also has a facility for student to get an email where student can see status of new books added to library system as well as status of their fine.