Library Management System

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Abstract: Library Management System is a software which is developed to organize and maintain a library. A library contains a collection of books of vast categories and other important journals which helps the student gain knowledge. Every institution has a library that is needed to be organized. The integration of books from all departments within a library makes it difficult for a librarian to organize them. Moreover, there are many information that are to be recorded such as books details, the books issued, the books returned etc. which becomes a tedious job when done manually. Therefore, this software helps the users to make their work easy and proves to be convenient for both beginners as well as advanced users. It improves the ordinary library system to facilitate the staff or librarians in doing their work effectively by reducing the human efforts and maintaining the library in the best possible way.

Keywords: Library management system, Library, manual library system, automated library system, PyQT5 Designer, My SQL Workbench.

I. INTRODUCTION

Library is a place in an institution which contains all kinds of books. It is the collection of knowledge in an institution. Library management system, also known as automated library system consists of organization and management of the various records such as student's details, book's details; user's details, books issued, books returned, transaction performance and handling these records in a systematic manner. This software is basically updating a manual library system into a software based computerized system so that the user can keep track of the account details, the availability of books and other necessary information in a convenient manner.

Library management system is a windows application which features a familiar and an attractive user interface which is combined with strong searching, insertion and reporting capabilities. It is an application which refers to library systems that are small or medium in size. It helps the librarians to manage their work with a computerized system by which they can record various transactions like issue of books, return of books, adding or deleting a new student or a member, updating any information about the student or a book, etc. It helps to provide the information on any book present in the library to the user as and when required. The purpose of the project is to provide a friendly environment to maintain the records in an effective manner. Some features of this software are:

- Improved customer service through greater access to accurate information.
- Reduction of cost and time.
- Greater accountability and transparency in operations.
- Making the functioning of the library faster.

Library Management System provides many impacts on the activities of a library and facilitates the user in performing their daily task with convenience. If we measure the traditional method with the automated system, we would witness a large gap between the efficiency in performance of the task to fulfill user's needs. The user can simply login to their account and add, delete or update any information. In this system various information are stored in a systematic manner by the use of databases. Separate database is created for students, books and the user. The student database stores information about a student's roll number, name, address, course and year. The book database stores information about a book title, author, publisher, cost, bill number, year of publishing and pages. The user database stores information about a user's id, name, address and number.

II. LITERATURE REVIEW

A Library Management System is a tool which a library using the old way to manage it in any institution can use and increase their work efficiency. The old method of searching for a book and providing the same to the student through manual work is a real hassle and hinders fast report generation. This software provides a central database maintained for every important record such as book transactions, book borrowing history and the happenings of the library and is organized systematically. This system is helpful for any institution or organization such as engineering, legal, medical, schools, colleges, corporate houses, research centers and many more.

There are many papers published and researches done in this area and we have learned the idea for a library system. Some of the paper works and their ideas are as follows. In [1] the implementation of the automated library management system proved to be helpful in the basic housekeeping functions of the library to the staff members. This is generally made for a

school library by making a home page which provides the information of books availability and the other important records. In [2], Online Library Management System**,** Ashutosh Tripathi and Ashish Srivastava has proposed a software developed in java focusing on the basic operations of a library including adding a book, a student, updating any data or transactions performed for a book. This is a windows application for a 32-bit operating system and can be used in windows 98 Windows2000, Windows XP and Windows NT, supported for another platform such as Applet Macintosh and UNIX. This software works with the combination of web page resulting in web application. In [3], Enhanced Library Management System has been designed to overcome the problem of existing system to provide the feasible solution to the user. It has some features which makes it different from normal library management system like it consists of three modules: Admin module, Librarian module and Student module. Every module has its own login page in this application. It is developed to manage the daily activities of a library in an efficient way.

III. ARCHITECTURE AND WORKING

Library management system is a python-based programming application and database connected system especially designed for staff members in an institution which eases the library management in a more systematic and cost-effective manner. This project makes the entire library management computerized for staff member so that they don't have to work manually in the library.

*Firstly, from the application icon situated in the desktop, it introduces a login window.
*In the login window the user will have to enter the valid login id and password, if in case the login id or the password is not correct then it will prompt a message that it is an invalid id/password.
* If the user logins successfully then it will introduce him/her to the main window.
*The user interface is made up of QT Designer which is an inbuilt feature of python.
*The home window functions will provide the following functions which is under a database created by My SQL Workbench called library: -

→ **Day to Day operations**
→ **Books**
→ **Clients/students**
→ **User**
→ **Settings**
→ Under settings there are three categories:
→   1. Book's author
     2. Book's categories
     3. Book's publisher

*Day to day application includes the student's records like student's name, roll no., branch, semester etc. It helps the staff to easily find the books issued by the students and tells exactly in which date they have to return the book. This table issue, re-issue and can find the record of issued books in a couple of seconds.
***Books function** gives us the well-organized facilities to add, edit and delete the books which are there in the library.
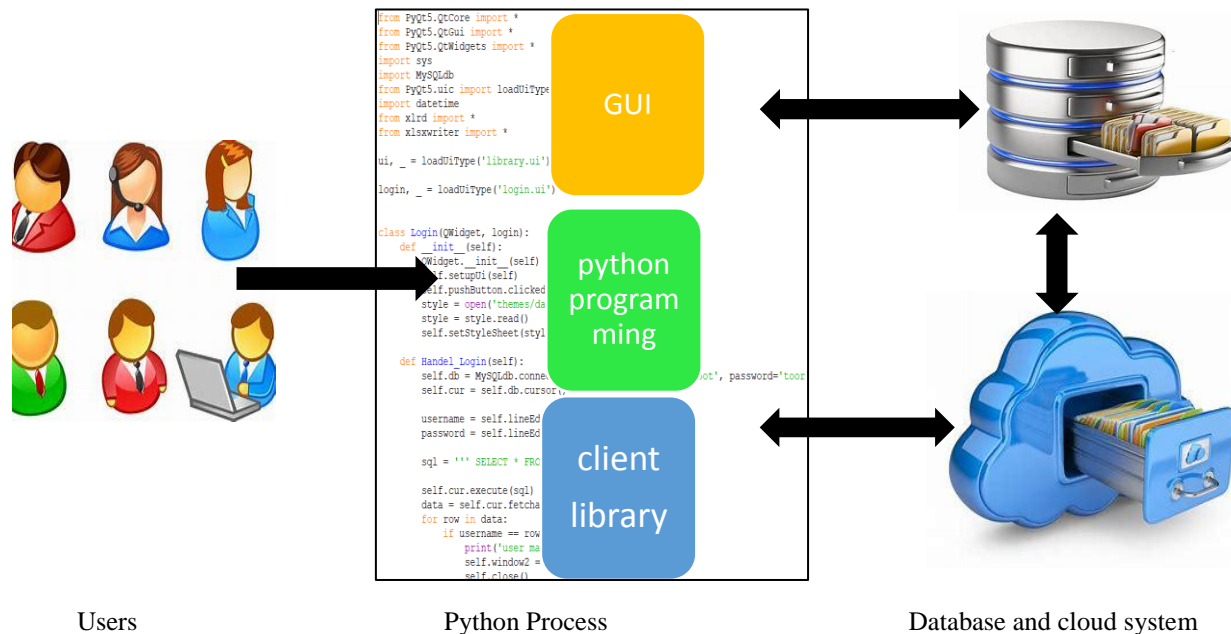***Clients/Students function** gives us the efficient facilities to add, edit and delete the student's records.

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*User function** provides the user to look after the account that who can run this management system and also run his/ her account systematically.

*Settings function** provides three categories under it, that are book's author, categories and publisher. We can record the categories, author and publisher of a particular book in this function.

*The database My SQL Workbench developed by oracle corporation used in this project is highly efficient and has a friendly user interface. It is very easy to access and uses data modeling which is based on conceptual representation.

| Users | Python Process | Database and cloud system |

IV. CONCLUSION

This project provides a computerized version of Library Management System which will benefit the staff of the library that they don't have to work manually for issuing, reissuing, and deleting of books. It makes entire process computerized and the vital role it plays that we don't need any online connection for doing anything where the staff can search books, can generate reports, issue books and reissue if they want and can keep track of all the books in their library. It has a facility of teacher's login where teachers can add, delete and update the books, keep track of the students records and even fine them if something wrong happens to the books. The database which we have used is my SQL workbench which is very effective, simple and easy to use database it allows us to work offline and is user friendly as well. Accordingly, it increases library management and makes the effective use of library. It provides us Efficient cloud data management and deploy library database seamlessly to make it easy for institutions to benefit from secure cloud services. The library management system is fully customizable and adaptable to the needs of educational institutions to provide benefit to the staff. College libraries benefit from scalable infrastructure, role based secure access, high performance and reliable to ensure seamless access to library database. Embracing sophisticated technologies is cost effective and a viable choice for education institutions. Thus, this library management system will ensure that the staff would not have to worry about working manually in the libraries.

ACKNOWLEDGEMENT

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