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AUTOMATED LIBRARY MANAGEMENT SYSTEM USING ORACLEAND PYTHON

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Abstract

Automated LMS - ALMS is a project used to develop a computer-based system to maintain all day-to-day activities in the library. It's a Windows app; It provides us with thorough information about the library. It was developed using an Oracle database and the Python Tkinter module. It helps to better manage the books properly in the library. This system is mainly used by employees and library administrators.

Key Words: *Windows Application, Microsoft Visual Studio Code IDE, Library Management System (LMS), ALMS, Library Modules, Transaction.*

Introduction

A library is a place where you can get a lot of books. In the enterprise, knowledge collection is a library. The information is normally housed in the library, either physically or digitally. A list of records on the maintenance of client data, transaction history, and book details may be found in the LMS. The ALMS project is working on a computer-assisted library management system. Because modern businesses are computer-driven, this ALMS is becoming increasingly important to humans, commodities, and computers. An automated computer-based system aids the librarian in the administration of the library. He may use this system to keep track of numerous transactions such as book issues, returns, new book additions, new customer additions, and so on. The issue of loss of member/book records, which is usually seen in a non-computer-based system, can be avoided by using the ALMS. This project contains the three modules as Admin, Staff, and Customer. The librarian module describes the book content and customer details such as adding the book, issuing the book, returning the book, etc. These are all employee-managed details. Customer unit that describes the customer's daily work in the library such as displaying book details, borrowing books, and returning books. The management module controls and takes care of the overall operation of the LMS. The administrator has done the work of managing the librarian's activities, he can do the work of adding employees, viewing the details of employees, and he can also delete them. It is accessed by staff members and library admin to manage the library by using a computer-based system.

Literature Survey

Title: Enhanced Library Management System,Author: A.Thendral Mary, S.Ramya, Mr.S.Krishna Murthy , Dr.A.Valarmathi

It proposed a project in Enhanced Library Management System for developing a computerized based system for maintaining all daily activities in the library. It is a Windows-based application development project that employs the Eclipse Neon IDE and the MySql

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database. It is capable of validating the user who accesses the application.

Title: Android application for Library Management System. Author: Prasanna Pillai, Sonal Singh, and Shreya Thakur.
This is transaction tracking and regulation software for libraries. They're doing it by setting up a VPN for the library that will only be accessible to students from the same college. Students will utilize an Android application and the server-side software will be createdin PHP.

Title: Online Library Management System Author: Bhubundra, Shradha Panwar, VijayVishnav

A library is a location where you can find all types of books. This system keeps track of all the books and may be accessed by several users at the same time from anywhere on campus. Students, librarians, and faculties each have their own login for this system. The database can be changed by librarians. Online users may look for books and renew their books. They may send messages to the librarian from anywhere on campus to proposenew books. They may see the issue and return dates of any book, as well as the amount they owe. This project is focused on developing a web-based online service.

Title: Towards eco-friendly database management systems
Database management systems (DBMSs) have largely ignored the task of managing the energy consumed during query processing. Both economic and environmental factors now require that DBMSs pay close attention to energy consumption.

Existing System
The existing LMS may be a manual method, by this method we tend to face many issues whereas accessing the library dealings method, for instance of longproblems, loss of data, and therefore the cash issue drawback. There're many ideas created for LMSs. It's troublesome to feature new options in the library system. The prevailing system doesn't have any facility for book requests and suggestions. It doesn't have the ability to come up with custom reports additionally as reports in issuing of books. The digitized LMS is the emergence within the region of Library innovation however there's the matter that arises is lack of network problems which will hold the hassle of users.

Architecture and Methodology Of ALMS Application

The architecture of ALMS will talk about the design of an automated LMS. Users are the administrators, employees, and customers who have accessed the library system using their access page and accessed library information by the means of the ALMS application. ALMS It helps the user to access the library effortlessly. Figure 1 shows the full structure of ALMS handouts.
We have designed the architecture in such a way that for every different role there is different access given to them. For example, the admin can access everything like add Staff Details. But, the Staff and customers just have access to their respective tasks.
The SQL scripting is Done using Oracle SQL developer. We have tried with some complex queries on our database and it has worked successfully. Each of our tables is following the BCNF normalization.
The connection between SQL Database and the frontend application is done using an open-source Python module cx_Oracle.
The frontend part is designed using another Python Library Tkinter. It helps in designing GUI applications efficiently.

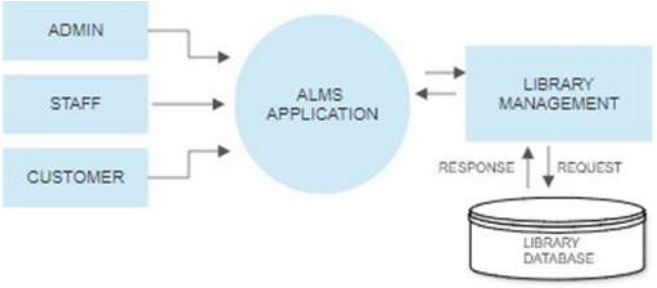

Fig. 1. The complete architecture of ALMS

Proposed Work

To get a better understanding of existing system problems an automatic LMS is to supply a possible resolution for the user. This project focuses on developing an application for LMSs that may be exploited for library processes. Through the LMS, the professional person, customer, and therefore the admin area unit connected alongside this method, will access the library information. they will simply method the library dealing, that helps to cut back the employment of workers. The foremost facilities of the system area unit are given to supply to produce quick dealing information of knowledge and scale back loss of data and provide knowledge security services in back-to-back. As a result, the system application will make it easier to resolve existing system issues.

Module Description

The Automated LMS project has three major Module descriptions which are,

- Admin Module
- Customer Module
- Staff Module

Every module has a separate task in library maintenance.

Admin Module:

Admin Module has only access to admins. The work of the admin is to manage the whole library database. He has full access to the database of ALMS.

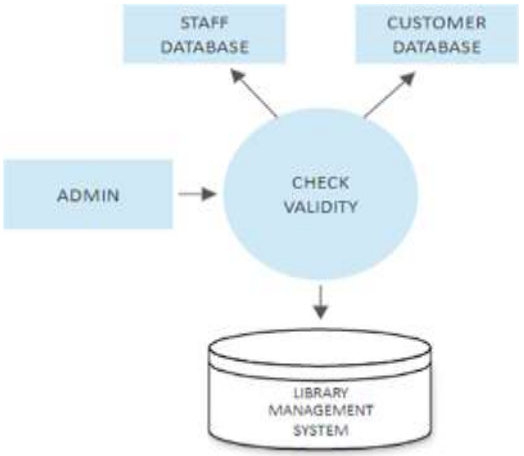

Fig. 2. The architecture of the Admin module

Staff Module:
Staff modules characterize the way toward keeping up the records of library data. This can mean the subtleties of books. The staff has their own page in the application. The Staff can be gone into the administration framework and make the library exchange simple. He can keep a book exchange by the way toward adding the book, viewbook, return book subtleties.

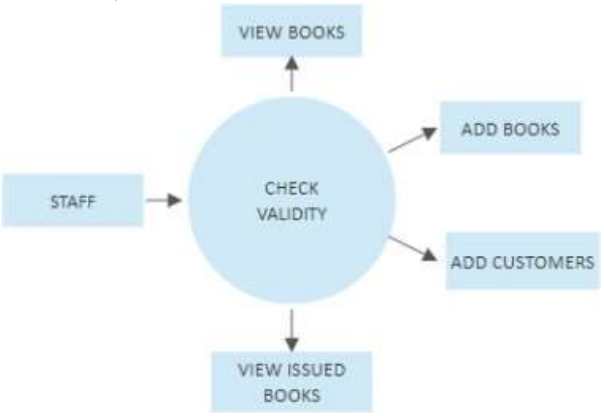

Fig. 3. The architecture of the Staff module

Customer Module:
The customer module enrolls the activity of Customer access in the library by this ALMS application. When the Staff has registered the customer, they can view the details of available books, return date, and view branches of the library.

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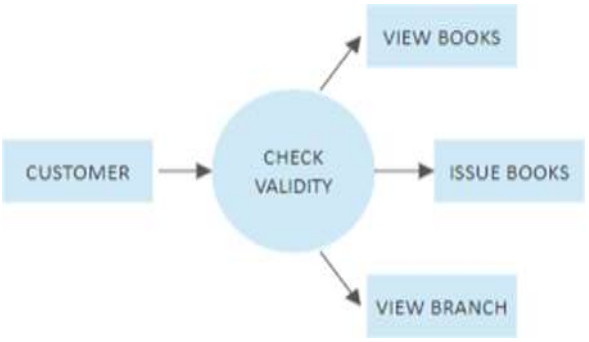
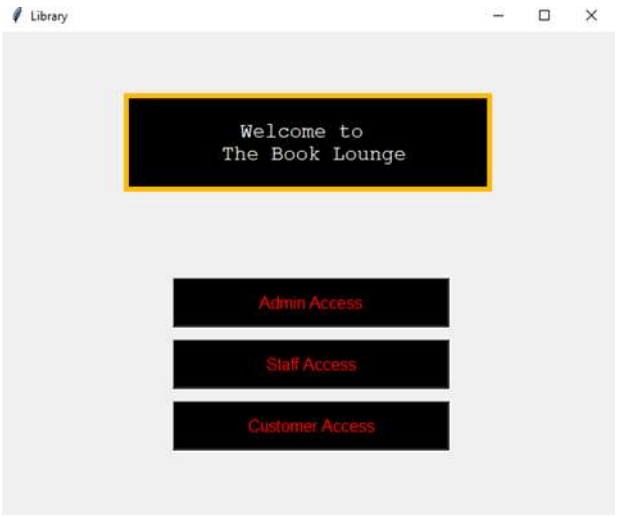


Fig. 4. The architecture of the Customer module

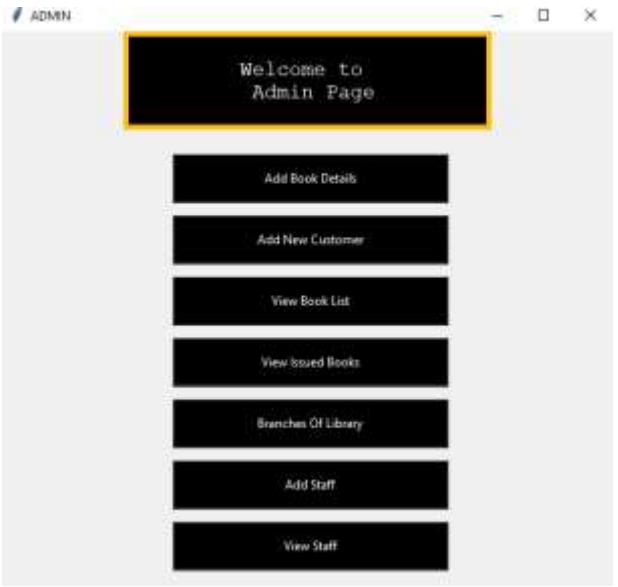
Results and Discussion

Result 1: Home page



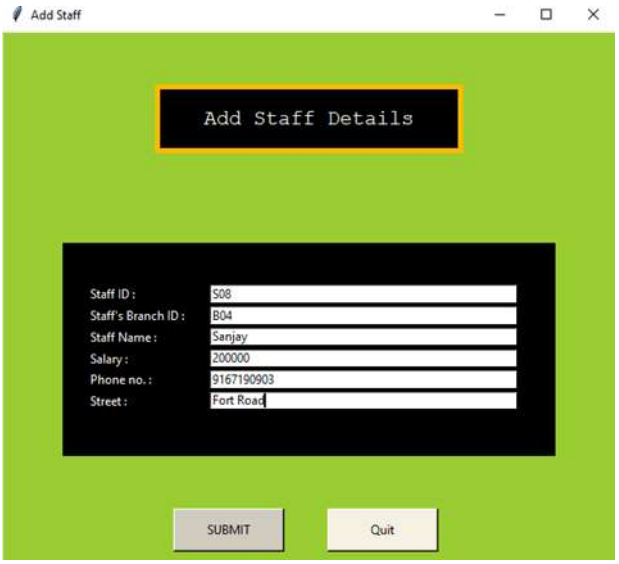
This Page would be the entry point for the Admin, Staff, and the Customer. From here they can go to their respective pages for doing the respective transactions.

Result 2: Admin Section



These are the following tasks that the admin can do such as Add Books, Add Customer, View Books, VIew IssuedBooks, Branches of Library, Add Staff, View Staff Details.

Result 3: Admin Add Staff Details



Admin has the access to add staff details and also view them. By inserting the following details in the Database following details can also be viewed.

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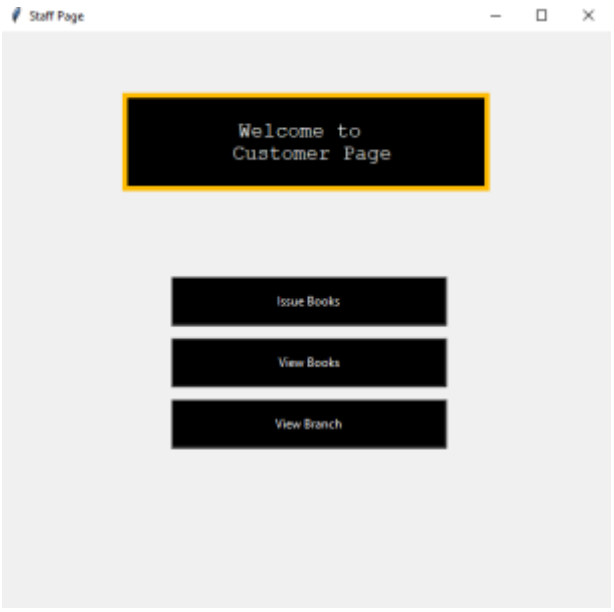
Result 4: Staff Section

In the Staff Section, it has access to View Books, Add Books, Add Customer, View Issued Books. This is an independent which provides all the transactions that the Staff can do.

Result 5: Customer Section



The Customer has access to Issue Books, View Books, and View Branch.

Conclusion

In this paper, we have introduced our task subtleties of a library application which is named AUTOMATED LIBRARY MANAGEMENT SYSTEM. It is the
windows application that is created utilizing the Microsoft Visual Studio IDE instrument and the Oracle Database to foster this venture. The frontend was built with Python 3.8 and the Tkinter Module. The primary goal of our work is to enable people to successfully access their library accounts in order to evaluate the availability of books in the library as well as to learn about the library's borrowing and return policies. It assists with beating the issue of tediousness, lessens information misfortune, and quick admittance to libraries.

Acknowledgment

We are very grateful and indebted to our mentor, Department Head for encouraging us and for her continued support in this project. We'd want to thank her for her constant constructive criticism and helpful recommendations, which have been quite helpful to us as we've worked on the project. "AUTOMATED LIBRARY MANAGEMENT SYSTEM USING PYTHON AND TKINTER".

We would like to emphasize the efforts of our companions who assisted in completing our project successfully.

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