

Greysense: Library Book Availability and Location Finder Application

Geeta S. Navale¹, Aditya Nandkhile², Dinesh Kalaskar³, Shubham Vadilkar⁴, Vaishnavi Karale⁵

Department of Computer Engineering^{1,2,3,4,5}

Sinhgad Institute of Technology & Science, Pune, India

Savitribai Phule Pune University, Pune, India

Abstract: *Library is a place where all kinds of books are available. This system manages and store books information electronically according to student needs. 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 libraries 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.*

Keywords: Book Location, Paperless, Notification, Fine Payment.

I. INTRODUCTION

A library is an area with many books and resources that can be made available to the users. It works as the heart of the organization. Most of the students strengthened the spread of knowledge and religious belief. A large collection of books and research works with articles attract researchers to improve their knowledge in every aspect. It encourages publications who sell their ideas in different ways. This knowledge enables users to benefit from higher learning outcomes in addition to personal development. The improvisation of this time makes a way to beautify the library into a digital library.

Many cumbersome procedures degrade library performance. For example, doing the move in a regular library often requires the help of a library person. So due to the slow development of the team, users often find it annoying. The library can handle mess with stats. All statistics are provided by the system. If any user is authorized, it will show username, personal statement, manual file and penalty file. They don't want to put on paper as a reference. By adjusting the stats of, they can change the parameters in. Although working as a guide, the Librarian can know the location through system itself. Librarian can save archives and user information for results and queries. It mainly monitors the number of books in the library and publishes book information. We have created the system with python.

II. RELEVANCE

The Smart Library System makes it easy for administrators to fulfill all responsibilities of the library. It also enables librarians and users to save time and increase the efficiency of complex tasks. Using this smart library, school administrations will be able to follow the teaching and extension of different library skills. They also had the opportunity to see how well the records of books and manuscripts were kept. Librarians and administrators can access various publications to keep up with the latest developments.

III. MOTIVATION

Daily operations of the library service area, user registration, bookkeeping, payment and withdrawal of library materials, lending service, updated information service, etc. Library work is often tedious, monotonous and time consuming, which can affect staff satisfaction and thus reduce their productivity. For example, computers are used as excellent research aids; can help users find products that might not find on the shelves. In an automated library environment, library software can

provide greater access to library users, and users can access annotations, summaries, etc. Allows you to search for information in the library for As the record, the keyword.

IV. LITERATURE SURVEY

Yuchen Zhang, et al., [1] put forward the idea of Smart Campus to provide educational services to enhance the effectiveness and accuracy. To provide the smart services "Smart Campus" are built in which Smart Library is one of the important and major aspect. Smart library is supported by IoT, with the attribute of knowledge sharing, ease of use and service efficiency.

Smart libraries are the integration of both hardware and the software with a wide range of opportunities for readers. The space of the library will be an inside lab, where the researchers, students and staff can developed the smart technologies and also collect data more efficiently organized, resource- friendly, flexible, sustainable, green, and socially inclusive [2][9].

Wang Zhigang [3] presented a system that aims at providing an RFID (Radio Frequency Identification) Library Management System which comprises of smart gates equipped with sensors, smart kiosks for querying books and RFID checkouts. The procedure for borrowing and returning include the user query- ing for the desired material using smart kiosk. The latter must then show the book to RFID readers for inserting and updating records. RFID is used to locate the position of books to shelves, and to store information of shelves books and book carts.

Heru Supriyono, et al., [11] suggested to make use of QR tags for locating the position of a book and integrate a small GLCD screen which display the results and the path to the items. It aims to solve the problem of disordered books on the shelves. It focuses mainly on locating the book on the shelves. As such, the user should already retrieve the rack location of the book which he will enter in a handheld device equipped with a screen and keypads. The device will read the user location and locate the QR tag corresponding to the location of the rack and show the shortest path.

An open source automated library system with book

recommendation by using a combined method applied for library systems. This approach employs the machine learning of support-vector machines consisting of multiple features such as title similarity, category and bibliographic information of books based on loan record as learning data. The bibliographic data are collected in the library database center. This recommended method is based on the title similarity and bibliographic information of books such as author, category, number of views and year of publication [5][7].

The information retrieval process involves the multiple links such as determining goals, selecting the retrieval systems, and also formulating strategies. Based on this, the construction of the smart library system based on the book information retrieval [2]. With the improvement of people's search requirements, search engines are constantly adapting to users requirements. In addition to some simple specialized search and classified navigation, there are also more professional search engines. To improve the search accuracy and construct the efficient system, this paper proposes the intelligent information retrieval model and designed the smart library system [4].

Manuel Garcia [6] proposed a system where self service is defined as the priority of users, they will not require the librarian for every small query it can be done through direct user interaction with the system. Thus aims to fine-tune the conventional librarianship and hopefully introduce the next generation of library systems by integrating concepts of self-service solutions and human computer interaction.

Oussama Tounekti, et al., [8] referred to an assumption that most of the users prefer online payment methods over traditional cash payment. A user friendly system for cashless transaction that helps to comply all Payments for book charges, the library subscription fees on yearly and monthly basis, over due amount will be done through online payment. Cashless transactions can be done by using credit cards, debit cards, UPI transaction or net banking. Mohit Gupta, Sridevi Jetty [10] recommended that smart applications provide all the relevant services of the library and can help the libraries to receive feedback, comments and provide notification services to users. Such as library mobile apps offer remarkable flexibility to reap the advantages of library services through the mobile phones. User can access E-content as well as multimedia information by the Library app hosted by a particular library either online or offline with the content broadcasted for the application and stored in database. Besides ease, mobile technologies present new opportunities for libraries to promote access, to reach the unreached, observe and receive feedback and provide seamless connectivity of

its resource. These applications provide a global access to the user as they can connect with the library from any place at any time to save the time of user. The ease in usage increases the interest of user and also enhances the reading habits

Summary of Literature Review

The above survey of various researchers of Library system 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. There are many papers published and researches done in this area and we have learned the idea for a library system. An automated library management system proved to be helpful in the basic housekeeping functions of the library to the staff members from Literature survey, it is concluded that the time spent by students and librarian on manual activities is more so automated system will reduce it, thus students can be greatly benefited.

V. SYSTEM ARCHITECTURE

The Fig. 1 illustrates the System Architecture of the GreySense Application.

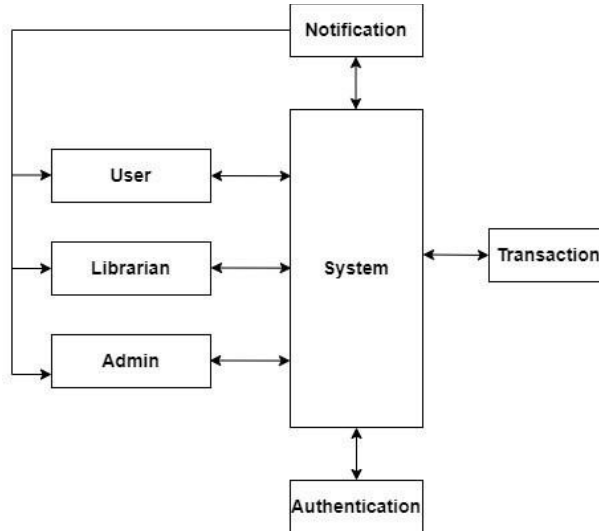


Fig. 1. Block Diagram for GreySense

- User: User is the reader who can perform following operations : Register, Login/Logout, Get Catalog, Search book availability, Reserve/Renew book .
- Librarian: Update database of a particular user through system and manage all operations like issue, add , update, remove books.
- System: Manages all operations in the front-end and back-end of the application.
- Notification: The system sends an email to the user on successful registration to let him/her know about their user id and confirmation.
- Transaction: Payment for book charges, library subscription, late fine, due amount will be done using online payment methods to have cashless transaction.
- Authentication: Only registered and authenticated users will be eligible to access system.

VI. RESULT

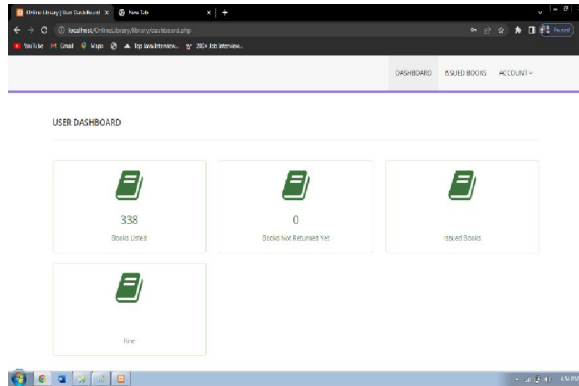


Fig 6.1 : User dashboard

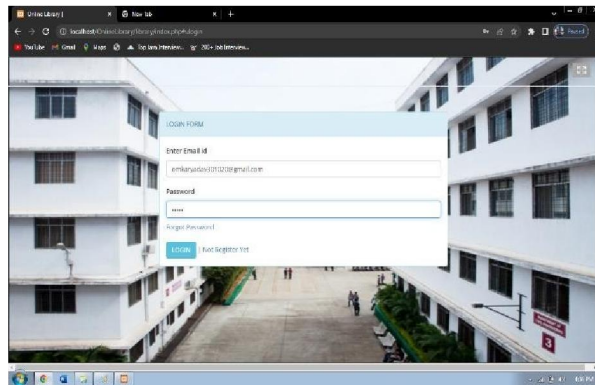


Fig 6.2 : Existing user login by using mail id and password

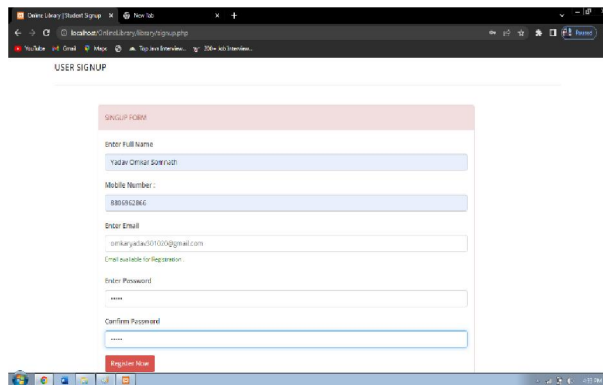


Fig 6.3: New user sign up form

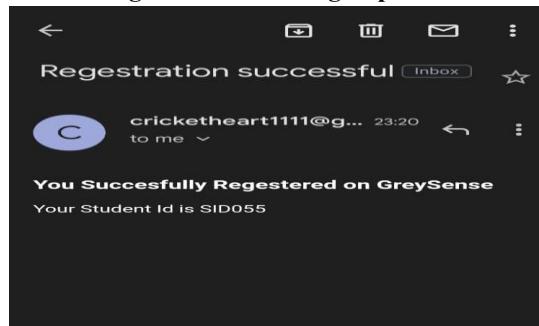


Fig 6.4 : Mail specifying user id sent to user on successful registration

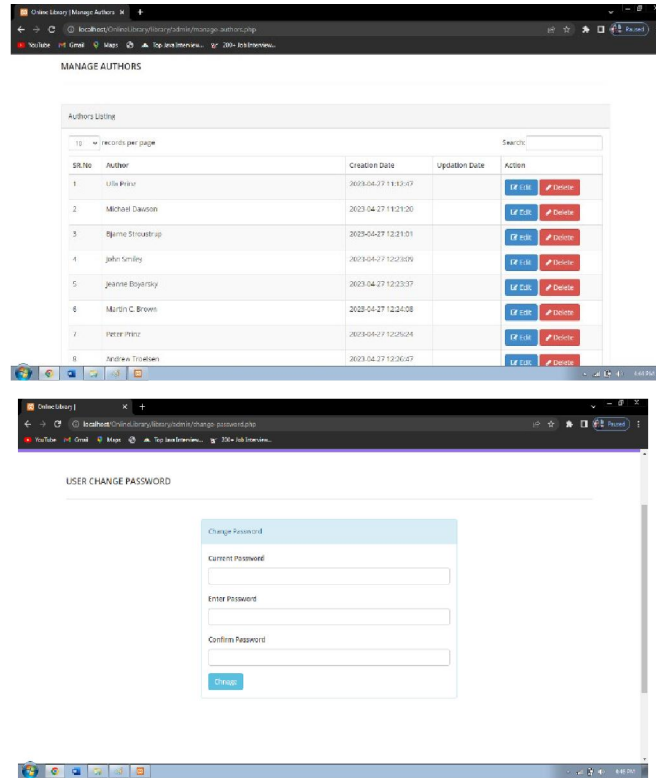


Fig 6.5: Change password

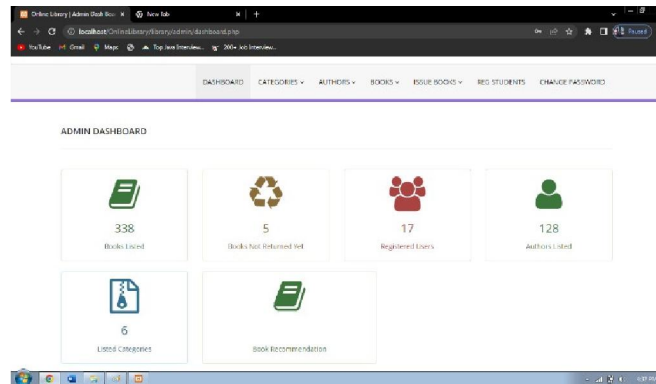


Fig 6.6 : Admin Dashboard

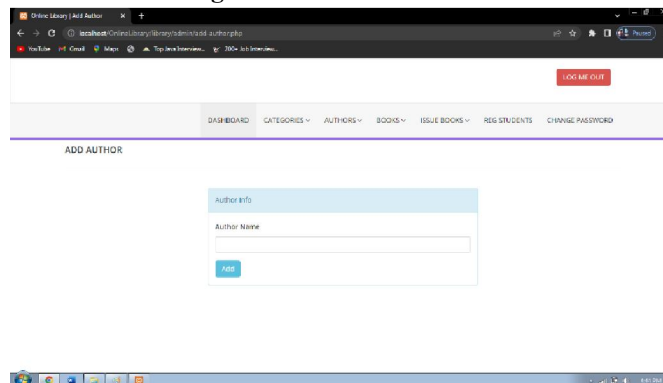


Fig 6.7: Add Author

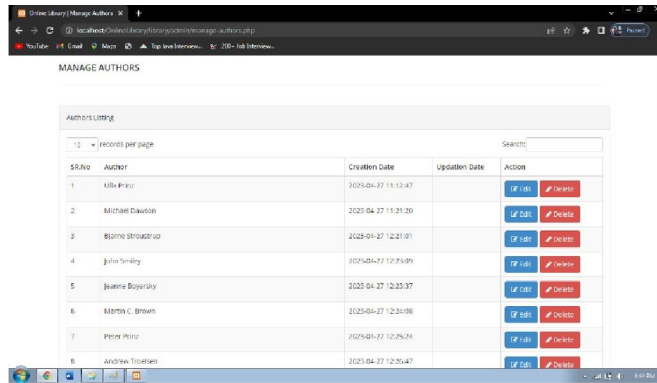


Fig 6.7 : Manage Authors

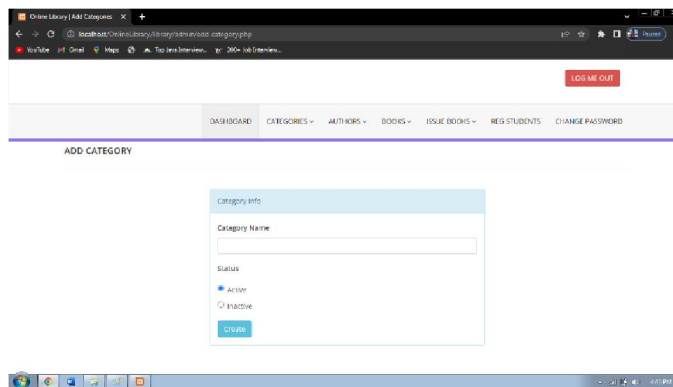


Fig 6.8 : Add category

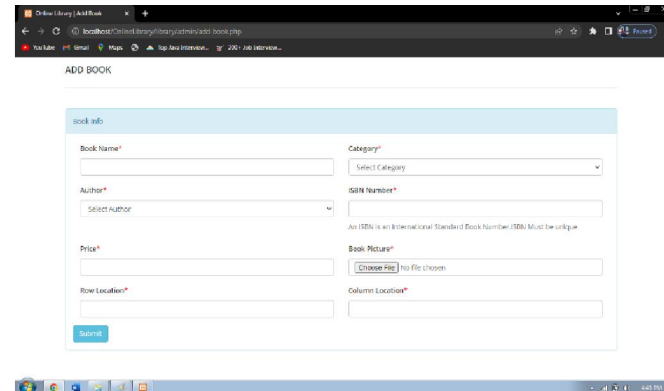


Fig 6.9: Add new book

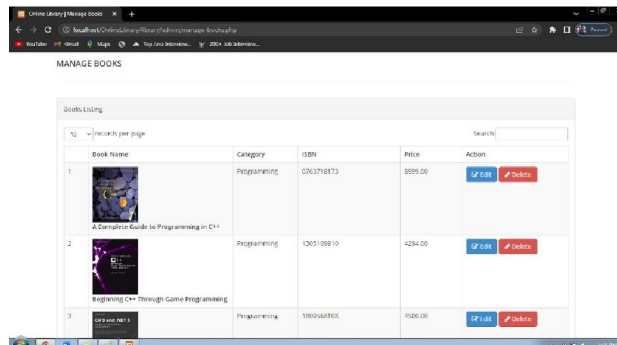


Fig 6.10: Manage books

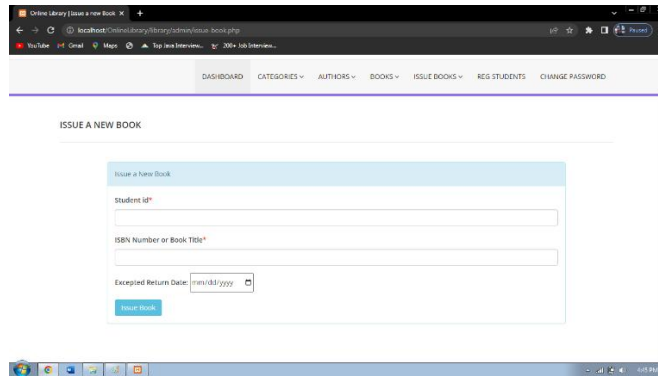


Fig 6.11 : Issue new book

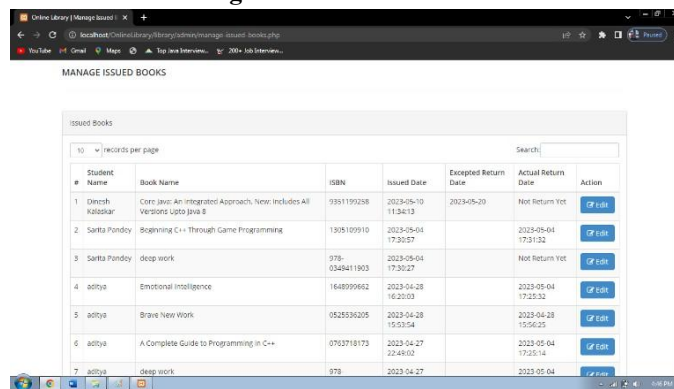


Fig 6.12 : Issued books

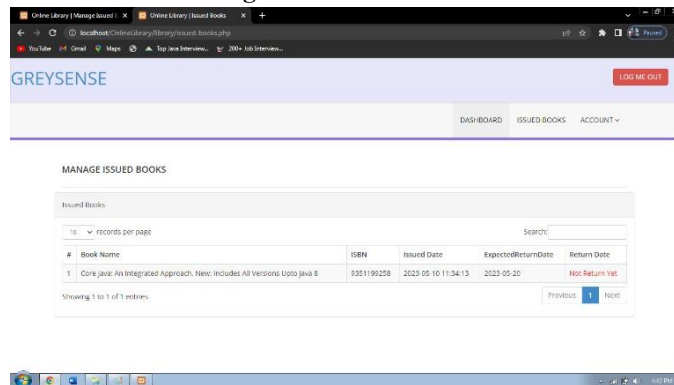


Fig 6.13: Manage issued books

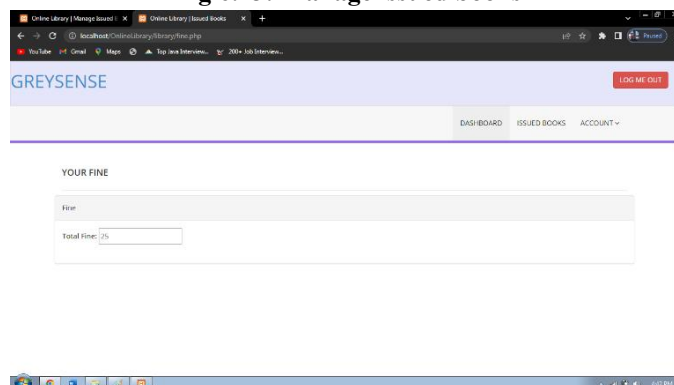
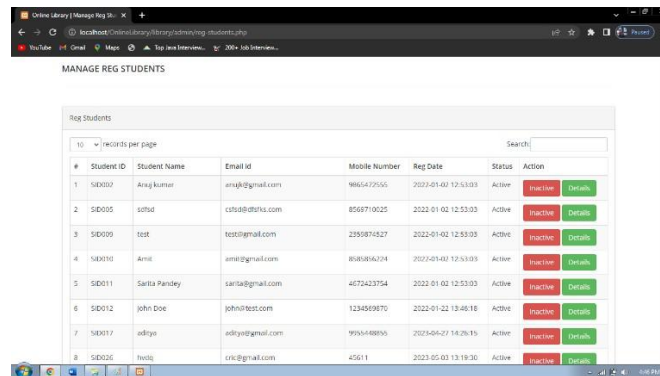


Fig 6.14: Fine Calculation



#	Student ID	Student Name	Email id	Mobile Number	Reg Date	Status	Action
1	SID002	Araj Kumar	arajk@gmail.com	986542555	2022-01-02 12:53:03	Active	Deactive Details
2	SID005	sdhd	sdhd@sdhks.com	8569710025	2022-01-02 12:53:03	Active	Deactive Details
3	SID009	test	test@gmail.com	2350874827	2022-01-02 12:53:03	Active	Deactive Details
4	SID010	Amit	amit@gmail.com	8508364204	2022-01-02 12:53:03	Active	Deactive Details
5	SID011	Santa Pandey	santa@gmail.com	4672433754	2022-01-02 12:53:03	Active	Deactive Details
6	SID012	John Doe	john@test.com	1234569870	2022-01-22 13:46:18	Active	Deactive Details
7	SID017	aditya	aditya@gmail.com	993648895	2023-04-27 14:26:15	Active	Deactive Details
8	SID036	hooq	hooq@gmail.com	45611	2023-05-03 13:19:30	Active	Deactive Details

Fig 6.15 : Manage registered students

VII. FUTURE SCOPE

The book availability and location finder application holds immense potential for future development and expansion. Continuous improvement and adaptation to user needs are essential for the application's long-term success.

- **Enhanced Recommendation Engine:** The recommendation system can be further improved by implementing advanced algorithms, such as machine learning and collaborative filtering techniques. By analyzing user preferences, reading patterns, and social interactions, the application can provide more accurate and personalized book recommendations.
- **User Reviews and Ratings:** Incorporating a user review and rating system can allow users to share their experiences and opinions about books they have read. This feature can help other users make informed decisions and discover popular or highly rated books.
- **Social Features:** Adding social networking elements to the application can enable users to connect with fellow readers, join book clubs, share book recommendations, and participate in discussions. This fosters a sense of community and enhances the overall reading experience.
- **Expansion to E-Books and Digital Libraries:** The application can be extended to support digital libraries and e-books. Integration with popular e-book platforms can allow users to access and borrow e-books directly through the application. This feature would broaden the scope of available books and cater to the growing demand for digital reading.
- **Accessibility Features:** Including accessibility features, such as text-to-speech functionality or support for screen readers, ensures that the application is accessible to users with visual impairments or reading difficulties. This promotes inclusivity and widens the user base.

VIII. CONCLUSION

GreySense is an essential application to make library services effortless. The existing system does not provide features of Online Transaction, Convey Notification, User Interaction and Book reservation which our system will overcome. As there is vast development of Internet and user friendly applications, it will ease the student and reader's effort. This system reduces human effort with effective management of library. The system is designed to control and manage library applications like shelving, sorting, sending notifications, recommending books, online payment and database management. It can be used in various places as schools, colleges, universities, companies, hospitals, private and public library. This system will be user friendly easy to access and manage that will provide a range of useful features which would be better than traditional library system.

REFERENCES

- [1] Yuchen Zhang, Christine Yip, Erwan Lu, And Zhao Yang Dong. "A Systematic Review on Technologies and Applications in Smart Campus: A Human-Centered Case Study", Feb 2022
- [2] Yongjie Zhang. "Construction of Smart Library System Based on Book Information Retrieval", Feb 2021

- [3] Wang Zhigang."Research on the framework on Library management system based on IOT",Jan 2021
- [4] Kitti Puritat,Kannikar Intawong."Development of an Open Source Automated Library System with Book Recommendation System for Small Libraries",Dec 2020
- [5] Eleni Giannopoulou, Nikolas Mitrou."An AI- Based Methodology for the Automatic Classification of a Multiclass Ebook Collection Using Information From the Tables of Contents",Dec. 2020.
- [6] Manuel B. Garcia."Human-Library Interaction: A Self-Service Library Management System Using Sequential Multimodal Interface",Nov 2020
- [7] Naeem Iqbal, Faisal Jamil, Shabir Ahmad."Toward Effective Planning and Management Using Predictive Analytics Based on Rental Book Data of Academic Libraries",April 2020
- [8] Oussama Tounekti,Antonio Ruiz-Martinez, Antonio F. Skarmeta Gomez."Users Supporting Multiple (Mobile) Electronic Payment Systems in Online Purchases: An Empirical Study of Their Payment Transaction Preferences",Jan 2020
- [9] Azhar Ozeer, Yash Sungkur, Soulakshmee D. Nagowah "Turning a Traditional Library into a Smart Library",2019
- [10] Mohit Gupta, Sridevi Jetty"Library in Every- one's Pocket",2018
- [11] Heru Supriyono, Muhammad Ramadhan Fitriyan, Muamaroh."Developing a QR Code- based Library Management System with Case Study of Private School in Surakarta City Indonesia",2018