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Library Automation

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Abstract—**The traditional methods applied in libraries and information centers for storing and disseminating of information have been changed into the modern techniques. The library management system is a project which aims at developing a computerized system to maintain all the daily work of the library. This project has many features which are generally not available in normal library management systems like facility of user login and a facility of teacher login. Through admin login, admin can monitor the whole system. In student login, after logging into their accounts they can see a list of books issued and its issue date and return date and also the students can reserve the books. This paper briefly discusses about automating the Library Management System, and application of Barcode technology in the library of the department of Electronics and Communication, Vidyavardhaka College of Engineering. Overall, this project of ours is being developed to help the students as well as staff of the library to maintain the library in the best way possible and also reduce the humanitarian efforts.**

Keywords—Library Management System, Admin, Users, Barcode, Database

I. INTRODUCTION

The library plays a critical role in our society. It is an important component of any educational institution, which is the hub of the teaching, and learning activities where students, researchers and teachers can explore the vast resources of information. The biggest characteristics of the department library are a highly professional book collection that provides a convenient conditions for teachers and students to access information. But with largely increasing number of the library's books, the traditional manual operation management is very low efficiency. Therefore, it is necessary for teachers and students of the university to use the modern library management technique. In most of the libraries, working is still done manually. It is inherited the problems associated with Books issue, reissue, return all this activity are done by librarian and it also increases the labor cost. . So instead of doing this manually, we are creating the system named as Library Automation System. The advancement and proliferation of computer and communication technologies and cost reduction coupled with the affordable relational database management systems (RDBMS) for data management, have resulted in the development of library management systems (LMS) more appropriately.

In our project we are going to design a computerized system to maintain the everyday work of the library. In this system user can get all information on the books, they can check the availability, reserve and renew the books through the internet. They will also get to know return date of the book through Email alerts.

II. LIBRARY MANAGEMENT SYSTEM USE CASE

The most important part of the analysis phase is the establishment of the use case diagram, which includes two entities, Librarian and users. This describes the role of each entity.
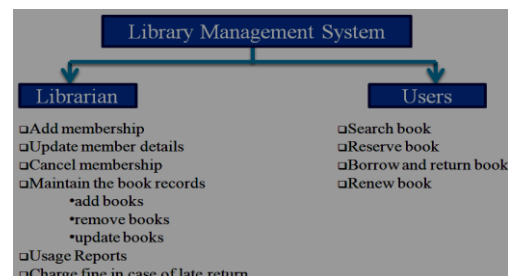

Fig. 1. Library Management System Use Case

According to the above analysis, figure1 shows the system overall use case diagram. The system administrator can manage the information of books and users, generate reports and can Charge fine in case of late return. As well as, the users can inquiry, reserve, borrow and return the books.

III. SYSTEM ANALYSIS

The Library Management System is a computerized system which helps users to manage the library daily activity in electronic format. It reduces the risk of paperwork such as file list, file damaged and time consuming. It can help the user to manage the transaction or record more effectively and time-saving.

A. Problem Statement

The problem occurred before having computerized system includes:

- File lost: When computerized system is not implemented file is always lost because of the human environment. Sometimes due to some human error, there may be a loss of records.

- File damage: When a computerized system is not there file is always lost due to some accident like the spilling of water by some member to file accidentally. Besides some natural disaster like floods or fires may also damage the files.

- Difficult to search record: When there is no computerized system, there is always a difficulty in searching of records if the records are large in number.

- Space consuming: After the number of records becomes large the space for physical storage of file and records also increases if no computerized system is implemented.

- Cost consuming: As there is no computerized system, to add each record paper will be needed which will increase the cost of the management of the library.

B. System Objectives

Improvement in control and performance: The system is developed to cope up with the current issues and problems of the library. The system can add user, validate user and is also bug free.

- Save cost: After computerized system is implemented less human force will be required to maintain the library thus reducing the overall cost.

- Save time: Librarian is able to search record by using few clicks of the mouse and few search keywords, thus saving his valuable time.

- Usage of Barcode technology for borrowing and returning of books

- Inventory management

- Report generation

C. Software and Hardware Requirements

1) Software Requirements
- Operating system: Windows 8 is used as the operating system as it is stable and supports more features and is more user friendly .

- Database: MS-SQL 2017 Database Server Community Ed is used as database as it easy to maintain and retrieve records by simple queries which are in English language which are easy to understand and easy to write.

- Development tools and Programming language: Visual Studio 2017 Community Edition used at the back end where c# is used to write the whole code and develop web pages.

- MS Internet Information Service for hosting website

2) Hardware Requirements

- Barcode reader

- Barcode printer

- PC running Windows XP or above OS

D. Existing vs Proposed System

TABLE I.   TABLE1: COMPARISON OF EXISTING AND PROPOSED SYSTEM

EXISTING SYSTEM	PROPOSED SYSTEM
Does not have any facility of teachers login or student login	Has a facility of student login as well as teacher's login
Does not have a facility of online reservation of books	Has a facility of online reservation of books
Does not have any facility to generate student reports as well book issue reports	Provides librarian with a tool to generate reports
Separate ledgers had to be maintained to store the details of books and users	Database holds the details of all books and users
Does not have any facility to send Email alerts to the users	Has a facility to send automatic Email alerts to the users
The students and staff borrow books by searching the required title in every rack from a library, which is a laborious and time consuming process.	In the proposed system, the students and staff can browse, reserve and borrow the books using e-system.
Does not have any track of lost/ missing books	Have a track of lost/ missing books
separate Library cards are required	Separate Library cards are not required

E. Usage of Barcode Technology in Library Automation

Barcode technology works in the same way as a keyboard. As pressing a key sends a signal containing a character code to the computer, reading a barcode results in the same kind of signals being sent to the processor. Barcode scanner is a device used to extract information optically from the barcode

F. Advantages of Using Barcode Technology

Application of bar code technology is made in the libraries with a view to automate the data entry process of the circulatory system. The use of barcode technology increases efficiency and eliminates human errors as in case of manual data entry. It Increases the speed of operation.

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Fig. 2.   Typical Barcode and Handheld Reader

- Increased accuracy of data input.
- It Improves efficiency of the staff and quality of services
- Real time data collection
- Highest degree of reliability
- Saves the time of borrower
- Perfect entry and retrieval of data
- Labor savings by avoiding manual system
- Improves information availability and data integrity.

G. Database

Fig. 3.   Database Management System

A database is an organized collection of data. It is the collection of schemas, tables, queries, reports, views, and other objects. The data are organized to model aspects of reality in a way that supports processes requiring information DBMS is computer software application that interacts with end-users, other applications and database itself to capture and analyze the data.

IV. SYSTEM DESIGN
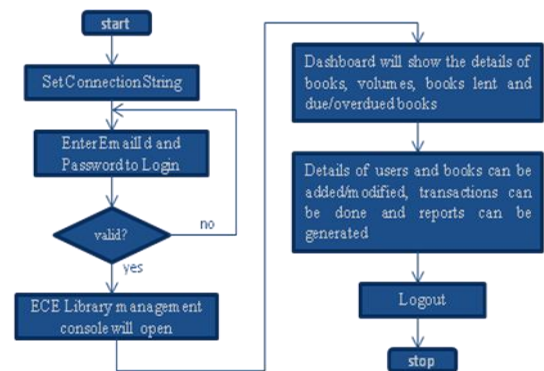
A. Admin Module

Fig. 4.   Flow chart for Admin Module

Admin is the default user. By setting up the connection string and entering the email id and password, Library management console will open with the dashboard which shows the details of books, volumes, books lent and due/overdue books. He/she is given with various functionalities like to add/modify the details of users and books, transactions and reports can be generated.
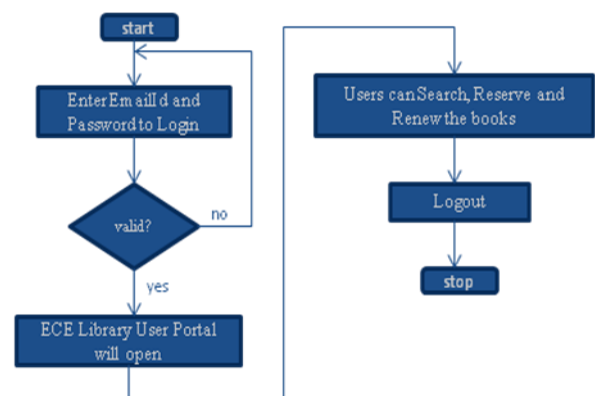
B. User Module

Fig. 5.   Flow chart for User module

User will get into the Library User Portal by entering the username and password, where they can Search, Reserve and Renew the books.
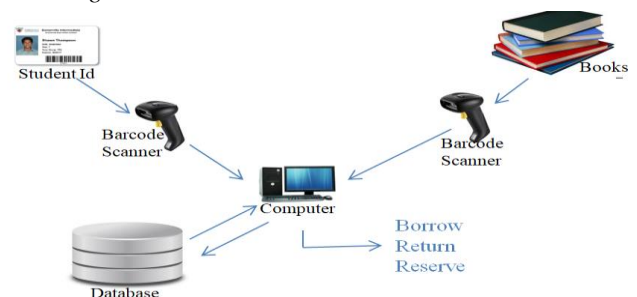
C. Working

Fig. 6.   Working of Automated Library System

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When a library member wants to issue any book from library, all that is required by a member is to scan the ID cards having barcode. Once this card is scanned with the help of barcode scanners, the circulation counter assistant will come to know about credentials of the borrower. Having satisfied with the identity of borrower, barcode pasted on the document will be scanned in order to complete the issue process. It is also worthy pointing out here that at the time of return, all that needed is to submit the issued document at the circulation counter. Once the barcode label pasted on the document is scanned, all the information about the borrower, issue date, due date etc. will be highlighted on the screen of computer. In this way, barcode technology has played an important role in elimination of long queues in libraries at the circulation counter.

V.   IMPLEMENTATION AND RESULTS
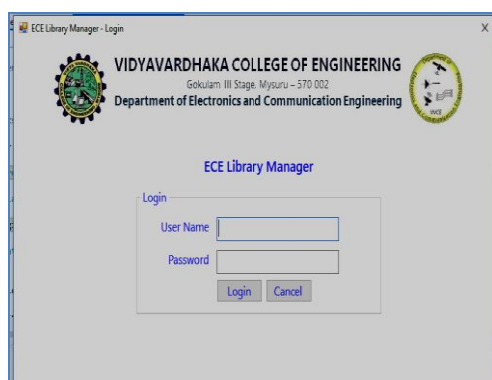
A. Login Process

Fig. 7.   Admin Login Unit

The librarian has the special privilege of having a unique master password for controlling the LMS system. The login dialogue box appears where he enters username and the corresponding password and enables the system for further usage.
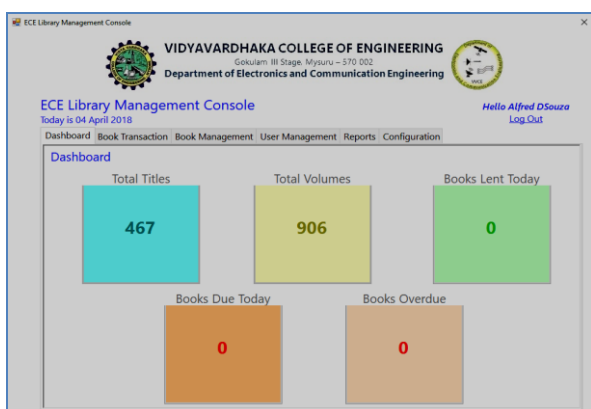
B. Librarian Interface
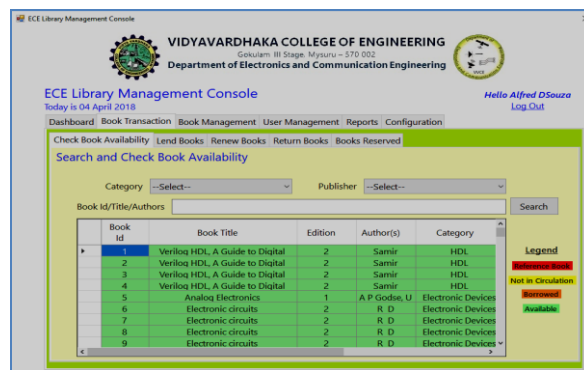

Fig. 8.   Dashboard

Fig. 9.   Book Transaction Unit

The database control is given to the librarian so that he/she can access it. Even then, we have created an option of viewing the transactions that have taken place. The search is made easy by giving him/her to search history according to the userid or bookid. Hence manual errors are removed and transactions have been more automated than before. Various actions of the UI like add, delete, issue re-issue and search by name, email-id have been displayed.
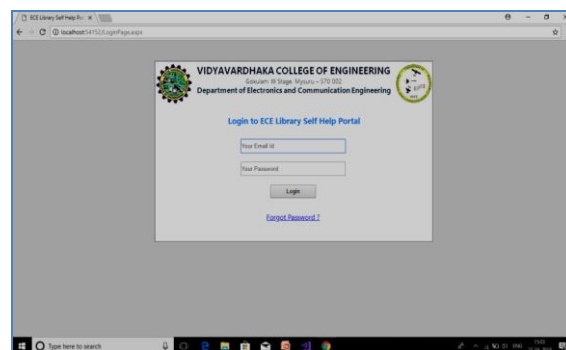
C. User Interface
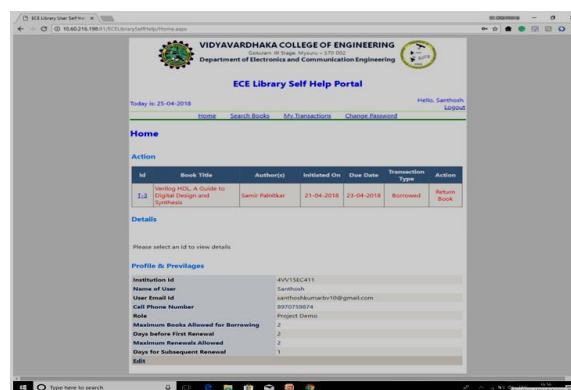

Fig. 10. User Login Unit

Fig. 11. Library User Self Help Portal

The library website is developed, where each member of the library can access his/her account. They can view personal transaction details, the book availability; they can also reserve and renew it. This reduces time taken for transactions and standing in long queue as data is automatically uploaded. As

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internet is widely available, this can be reached to a large amount of users, irrespective of variation in devices.

VI. CONCLUSION

Now a day Library Automation has become the buzz word in the library profession and has become a bare necessity for any libraries. An automated library can provide a computerized version of library management system which will benefit the students as well as the staff, which a manual library can't do and saves the time and reduces labor resource. Barcode Technology used here to improve accuracy and eliminates the typing errors. The record keeping activities and various report generation become very easy with an automated library system. But the success of any library automation program depends upon its proper planning and execution. Hence library professionals need to take right initiatives in the right direction.

VII. FUTURE SCOPE

- Shelf Management: An automation library shelf management system to assist the librarians for more efficient shelf management to find any misplaced books in the library shelf. The purpose of this is to check either the book was at the right location or not.

- Self Check IN-Check out: Self Check-in / Check-out primarily for self issue and return of books in Library without the assistance of library staff.

- Advanced fine payment system can be added.

- Theft Detection

REFERENCES

[1] Debasis Das, Parnab Chatterjee , "Library Automation", International Journal of Research in Library Science, Vol 1, 2015.

[2] Neelakandan.B, Duraisekar,"Implementation of Automated Library Management System", International Journal of Applied Engineering Research, vol 1, 2012.

[3] Dr.Annaraman1, P. Thamarai, Dr. T.V.U. Kiran Kumar, "Smart Library Management System", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, April 2015

[4] Singh.G and Sharma.M, "Barcode technology and its application in Libraries and Information centre". Vol.1 No.1, 2010.

[5] Akshatha.M, Alankrutha.K.P, Javitha Armet.G, "Student Authentication and verification system using barcode scanner", 2017.

[6] Shahwar Fatima, Mehtab Alam Ansari, "Barcode Technology and its Impact on Seminar Library", 2017.

[7] Yujun Li , Hao Zheng, "Design and Implementation of a Library Management System Based on the Web Service", 2012.

[8] Bansode, Sadanand Y A , "Survey of library automation", 2008.

[9] M.Pandya and Maheshbhai Darbar. "Users perception on library automation", 2014.

[10] Dr. Hilal Ahmad "LIBRARY AUTOMATION IN INDIA: A Survey Of Information Retrieval System Of Central Libraries Of Iit Delhi, Iit Kanpur And Kashmir University", 2014.

[11] Seema Vasishta and Maninder Kaur Dhanda, "Transforming a Traditional Library to Modern Library", DESIDOC Journal of Library & Information Technology, Vol. 30, No. 1, January 2010.

[12] Falup, Mariana, "Achievements and Perspectives in Library Automation and Modernization", Philobiblon, Vol. 12 , 2007.