A Project Report on

Novel Framework Smart Library

Submitted in partial fulfillment of the requirements for the award
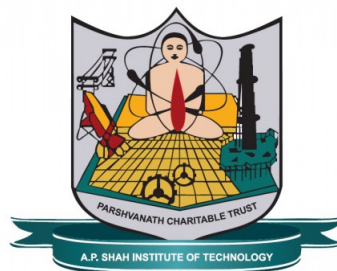of the degree of

Bachelor of Engineering

in

Information Technology

by

Pravin Jaiwal (16104058)
Mohit jain (16204033
Sanjog Mhasde (15204006)

Under the Guidance of
Prof. Kaushiki Upadhyaya

Department of Information Technology
A.P. Shah Institute of Technology
G.B.Road,Kasarvadavli, Thane(W), Mumbai-400615
UNIVERSITY OF MUMBAI

Academic Year 2019-2020

Approval Sheet

This Project Report entitled **"Novel Framework Smart Library"** Submitted by **"Pravin Jaiswal"(16104058),"Mohit Jain(16204033)","Sanjog Mhasde(15204006)"** is approved for the partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering** in **Information Technology** from **University of Mumbai**.

(Prof. Kaushiki Upadhyaya)
Guide

Prof. Kiran Deshpande

Place:A.P.Shah Institute of Technology, Thane
Date:

CERTIFICATE

This is to certify that the project entitled *"Novel Framework Smart Library"* submitted by *"Sanjog Mhasde" (15204006)* for the partial fulfillment of the requirement for award of a degree *Bachelor of Engineering* in *Information Technology*,to the University of Mumbai,is a bonafide work carried out during academic year 2019-2020.

(Prof. Kaushiki Upadhyaya)
Guide

Prof. Kiran Deshpande   Dr. Uttam D.Kolekar
Head Department of Information Technology   Principal

External Examiner(s)

1.

2.

Place:A.P.Shah Institute of Technology, Thane
Date:

Declaration

I declare that this written submission represents our ideas in our own words and where others' ideas or words have been included. I have adequately cited and referenced the original sources. I also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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(Signature)

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(Sanjog Mhasde,15204006)

Date:

Abstract

Libraries are ever growing entities.In academic institutions, libraries play a dual role of supporting the College's curricula ,syllabi for students and research by the faculty .A College library has to fulfill educational and research objectives.It facilitates the students in accessing learning material as prescribed in the syllabus that are needed for class work and the faculty for their study,teaching and research. Smart Library is a project which aims in developing a computerized system to maintain all the daily work of library.This project has many features which are generally not available in normal library management systems like facility of user login and teacher's login.It also has a facility of admin login through which the admin can monitor the whole system.It has also a facility where student after logging in their accounts can see list of books issued and its issue date and return date and also the students can request the librarian to add new books by filling the book request form.Our system also notifies the student when he/she logins into his/her profile if he/she has not returned a particular book.The system also charges a student certain charges if they have not returned their books.We have a unique identification for each book which would reduce the queue in the library .This will be implemented with the help of Barcode .The librarian after logging into his account i.e admin account can generate various reports such as student report,issue report,teacher report and book report. Overall this project of ours is being developed to help the students as well as staff of library to maintain the library in the best way possible and also reduce the human efforts. A Simple and flexible library portal through which e-books/ and hard-copy books,journals of all possible genre can be stored and made available for library users. It's a responsive web application for libraries of all sizes that want to modernize their services and improve staff productivity. This software can be used both web-based or local host based.

Introduction

Smart Library is the systematic method of managing the whole library through an interactive interface. Using Smart Library, the librarian can handle basic functions of a library such as storing all the library item details like author name, edition, price,books,details of students,record of borrowed and issued books,fines,generate QR Code,etc. of all the books in a library database. It helps to provide information on any book present in the library to the user as well as a faculty.

Library keeps a track on all the books that are issued, returned and added to the library. Overseeing fee collection and fine issued to late return on the book are other important functions of Smart Library. Overall, having a Smart Library is important for an efficient, user-friendly, fast and secure library management - be it a small size college library having limited users and books or a large size public library.

Smart Library comes in various shape and sizes (e.g. small library software, cloud based library management software etc.), platform-specific (e.g. Windows-only, Linux-only, MAC-only) or supports multiple platforms (covering MAC, Linux, UNIX etc.), publisher-specific (e.g. Microsoft) or multi-vendor, static (i.e. fixed, updated manually by administrator) or dynamic (automatically updated by the SAM solution vendor), simple recognition (e.g. using just exe data) or complex recognition (e.g. tying together multiple footprints such as executable meta, registry entries, package manager details or product-specific details gathered by running scripts).

The smart library is very helpful to standalone libraries as well as libraries in schools, colleges, educational as well as other institutes and sometimes also in places of worship. They can take advantage of basic aspects of providing information about the materials and their content. Our Smart Library have a QR code function with the help of which we can save significant costs on paper, printing, manual labor, etc.

Smart Library is helpful in better decision making about what sort of materials need to be stocked or improved. Maintenance is not time-consuming. The library staff gets great help from the software data. Work of the library staff gets smoother and even the work of tracking different modules in the software can be divided among the staff for better control.

Objective

project aims and objectives that will be achieved after completion of this project. The aims and objectives are as follows:

- Online book issue.

- Request column for librarian for providing new books

- Student login page where student can find books issued by him/her and date of return.

- A search column to search availability of books

- Online notice board about new books, magazine.

- Borrowing and returning books function.

- Dynamic settings (Number of allowed books to borrow, Penalty, and Allowable days).

- Using QR Scanner to borrowing books.

- Scan QR code of members using QR Scanner.

- Search report using date from and date to.

- Member's record management.

Literature Review

- National University Library System:A Mobile and Web Application Framework for National University Learning Resource Center.Amber Jade A. Baetiong Joyce A. Balinquit Jeremiah T. Malicdem Kate S. Pangan National University – Philippines National University – Philippines National University – Philippines National University – Philippines College of Computing and College of Computing and College of Computing and College of Computing and Information Technology Information Technology Information Technology Information Technology Manila City, Philippines Manila City, Philippines Manila City, Philippines Manila City, Philippines baetiong.aj@gmail.com joycebalinquit@gmail.com jmalicdem45@gmail.com kpangan33@gmail.com ©2018 IEEE.

– The technology continues to progress as it paves way for the creation of a better and meaning life for humanity. The internet has become more popular today than those decades ago. The efficiency of various internet applications overshadows the importance of the library in the community. Nowadays, students prefer to search for information through the web than to go to the library. Librarians are settled with library systems that are bound only with the use of computers and laptops. However, the use of personal computers delimits the capacity of the librarian to work efficiently as he or she is constrained with its use as it is now allowed to move freely. Libraries would be more efficient and timely when the web and mobile application collaborates. The proposed NU Library System will integrate the library process such as circulation, inventory, acquisition, and cataloging into a one web application. The mobile app will help the users to uncover books for a particular topic, borrow books and receive notification regarding due date or penalty.

- Learning is the main reason people enroll in schools. As the civilization continues to develop and be innovative, mobile technologies begun to merge with the traditional process of gaining knowledge and creates learning opportunities for the students to build their interests and explore more about their subjects and goals. The use of technologies becomes a significant part of our daily lives since it begun to help people in collecting data and storing information.

- **A Desktop Application of QR Code for Data Security and Authentication**
Partiksha Mittra Department of Computer Science and Engineering Amity University Uttar Pradesh Noida, India pratikshamittra@gmail.com Nitin Rakesh Department of Computer Science and Engineering Amity University Uttar Pradesh Noida, India nitin.rakesh@gmail.com

"QR" is abbreviated as "quick response," is a reference to the speed at which the huge amount of information it contains, can be decoded with scanners. QR Code shown in figure 1 is a two-dimensional or matrix bar code developed in Japan by Denso Wave. They are sometimes referred to as 2D codes, 2D barcodes, or mobile codes. These are machine readable codes and comprise of black modules on white modules. It holds thousands of alphanumeric characters while the barcode comprises of only 20 characters. This two-dimensional symbol was invented for tracking of automotive parts, but these codes are increasingly found in other fields as well like linking to websites, product labels, advertising campaigns, SMS, contact details, email messages and much more. The information stored in codes varies from tracking information of the products produced in various industries to information of the business on a business card that redirects to the specific website. These small sized codes can also be hidden inside the image.

This document examines the QR codes and realizes the significance of data, information and distributes it in such an obscured or non–obscured way so that authorized people should be able to view it. At the same time, the data should remain publicly accessible but it should either be accessible to the authorized personnel or the ones who have the appropriate tools to view it. In order to improve the security of the information stored in QR code, a 2-D code encryption and decryption method based on cryptic data is proposed in this paper .An interesting use of QR code is to exchange information. Information exchanged can be private information exchange or public information exchange. The public information exchange using QR codes can take place with the help of existing tools and application, wherein no encryption is required. A far as the private information exchange is concerned encryption is required for the secured transactions.

This paper is further divided into five sections. Section first we have introduced QR code and its applications. Second section shows recent application area of QR codes. In third section we have proposed the application of QR code which is a developed application that helps in secure transfer of question papers via websites and interfaced among various universities.

- **Development of an Intelligent Web Interface to Online Library Catalog Databases Danny C.C. PO0 Teck Kang TOH Glenn HONG School of Computing National University of Singapore Lower Kent Ridge Road, Singapore 119260 Christopher S.G. KHOO Centre for Advanced Information Systems School of Applied Science Nanyang Technological University dpoo@comp.nus .e. sg Singapore 639798 . tohteckk@comp.nus .edu.sg assgkhoo @ ntu.edu.sg**

Library catalog databases are different from other kinds of textual databases, such as full-text databases and abstracts databases. It has the following characteristics:

The database records are very terse. Only information needed to identify the document uniquely is stored in the database - mostly title, author and publication information, although information from content pages is increasingly recorded. The records contain manually assigned index terms (usually taken from the Library of Congress Subject Headings) and a classification code (as part of the location number). Most of the records are of books and journal titles. They tend to cover a broader subject area than, say, journal articles and technical reports. They may also comprise several sub-documents which may not be described in the catalog record. For example, books contain several chapters and journals contain many articles.

Retrieval approaches that work well for full-text databases may not work well with library catalog databases. A digital library has to handle different types of records and documents, and probably has to use different retrieval approaches for each type. We believe that online library catalogues will be part of digital libraries for a long time to come, and that it is important to develop interfaces to help users search them effectively. It is well-known that users have difficulty using present-day online catalogs, most of which still require queries to be specified using Boolean expressions. Several researchers have investigated the problems users encounter, as well as the search strategies that experienced librarians use. For example, users have difficulty matching their search terms with those indexed in the online catalog. They have difficulty coming up with synonyms as well as broader and narrower terms related to their topic. Cousins found that many subject queries were not expressed at the level of specificity that was appropriate or suitable for searching the online catalog.

- **Library in Everyone's Pocket With reference to Bundelkhand University App Mohit Gupta MLISc, Student DLIS, Bundelkhand University, Jhansi – India mohitg1407@gmail.com Sridevi Jetty Deputy Librarian Central Library Bundelkhand University Jhansi – India sridevi.jhs@gmail.com**

Library mobile applications can be considered as pocket library or in hand library. The 'search term' is the initial approach which leads the user towards the use of Mobile apps such as: web browsers, encyclopedia applications and the RSS feeds. Currently many users are absolutely dependent upon the mobile apps. In this revolutionary era of digitization [1], it is the duty and responsibility of a library manager or knowledge expert to be excelled with these ICT developments.

The mobile application of Bundelkhand University was developed and launched by the authors on 25th April 2017 for Bundelkhand University is a complete package of knowledge and services. The App does not only have a normal OPAC but also provides a number of sections and their facilities like access to E-resources that are subscribed by the library. The App also provides access to various E-resources, audiovisual lectures of faculties on various subjects etc. Also the user can search for the desired document and its availability, issue status of the book, feedback, appointment booking with the faculties of the university and can also know about daily records updating. A user can also enroll for membership of library and reap all the facilities of student management system with their login credentials. The app also provides dictionary services. The application is beneficial to the library managers/knowledge experts and the users. A librarian can transform a non-user to user with the help of a library App with its variety of services provided. These Apps are a big rescue on part of the library patrons to search web OPAC for any kind of document and information details.

A library mobile App is an additional and essential application of mobile technologies to convert library services into an easier and better mode of access by providing assistance in various ways with e-services and connecting. The Beta results of Bundelkhand University mobile App through android smartphones has shown that the nature and access have become more affordable, easier and reliable without any bug. There is a rapid increase in the number of users who uses internet on mobile App and web apps like: Facebook, Whatsapp etc. These apps and web apps are most popular among youths.

- **Developing a QR Code-based Library Management System with Case Study of Private School in Surakarta City Indonesia Heru Supriyono Department of Electrical Engineering, Universitas Muhammadiyah Surakarta Surakarta, Indonesia Heru.Supriyono@ums.ac.id Muhammad Ramadhan Fitriyan Department of Informatics, Universitas Muhammadiyah Surakarta Surakarta, Indonesia ramright06@gmail.com Muamaroh Department of English Education, Universitas Muhammadiyah Surakarta Surakarta, Indonesia Muamaroh@ums.ac.id**

Manual library management system used in some private schools in Surakarta city has some drawbacks such as it needs longer time for borrowing process, member and collection checking, as well as report preparation. A QR code based computer information system was proposed to solve these problems. This paper discusses the development process of the system and then followed by the tests conducted and discussion. The objective of the work is to record the borrowing, extension, and returning processes as well as their report preparation using QR code based library management system. The information system was built in web-based environment using Bootstrap framework and the data was managed by using MySQL database management system. A camera connected to the computer was used to read the QR code. The test results showed that the optimum distance between QR code tagged book and camera was between 15 and 30 centimetres. The blackbox testing results showed that all functions of information systems working well as expected. The user acceptance test results showed that the system significant acceptance from the respondents so that the information system could be characterized as easy to use, functions and features provided meet the requirement, and able to increase service to the student. Finally, respondents suggested that they would like to implement the system at their school libraries.

It could be drawn from the development process, testing, and discussion are involving: (1) QR code has been successfully implemented to store library collection data in the form of tag which can be attached in the library collection, (2) developed information system able to read the data stored in the QR code using camera and using it in the transaction process with optimum distance between 15 and 30 centimetres, (3) blackbox testing results showed that all menus and features of the systems were working well as expected, (4) user acceptance test results showed that the system has high acceptance on its easiness to use, functions and features provided has met the equirement, and able to increase quality of service to the student. All in all, respondents have positive attitutde towards the system and they would like to implement the system at their school libraries. This work could be extended for example using mobile based technology.

Problem Definition

Educational institutes have library which traditionally rely on pen paper method to manually get data analyze and generates records of the students.Some institutes may use computer to done work which take less time as compared to manual.There is no smart library for students each institute may consider different parameters. If you don't have library card,you cant get book.First,you make library card and then issue the book form library. Then you will fill the details given by librarian and librarian also fill the book details for their record get to know on which date which book is given to whom. After that we have returned the book as per the expected dates.if you delayed to return the book you will be pay the fine as per the amount set by the college Dean.

having an official record review process can actually hinder timely feedback the rest of the year if the process is carried out without proper planning lack of documentation create problems became problem itself.This means the problem is not submitted to the librarian so it creates problem and possibly have chances to lost the books it cost a lot both in terms of time spent and money invested in book
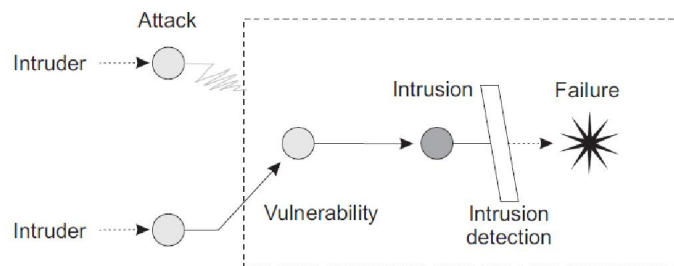

Figure 1: Intrusion Detection System

Proposed System Architecture/Working

The existing system of The College Library is run manually by entering data in books and keeping track of all the data in the books. The different processes involved are:

- To maintain book issued details of Students and Faculty manually.

- To maintain book return details.

- To maintain details of the current books stock.

- Calculating Penalty for Books CD's.

- To maintain the inventory details.

Drawbacks of the existing system

- The existing system has lot of problems such as

- The entire database is maintained manually which is rather tedious and error prone.

- Time delay is more because the librarian has to go through many records for entering the transactions of different batches and generating reports etc.

- Inventory Management of the Library becomes difficult as the number of books grow.

Proposed System
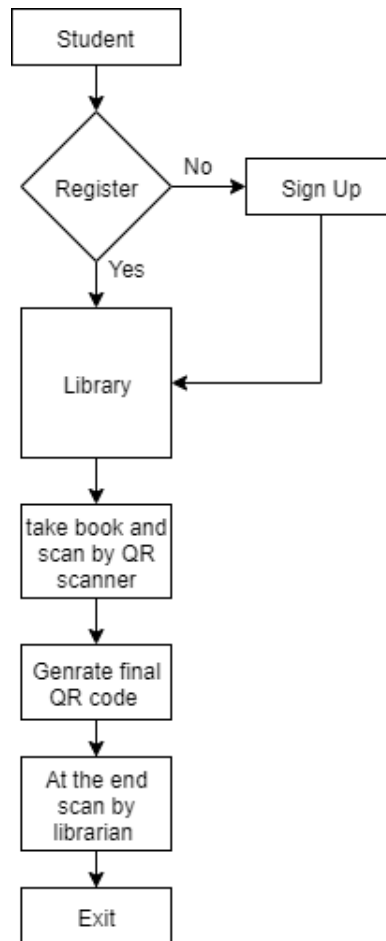
The proposed system tries to solve the problems mentioned above. The main objective of the proposed system is to provide information instantly as and when it is required. The main objective is to make the Library information details more efficient. This system should maintain different data files, so that the data can be retrieved easily and in an efficient manner. The system is very interactive. It should ensure process integration to the desired extent, various reports should be generated as the need be. This system should also ensure that there is no redundancy in the recorded data.

Advantage of proposed system
Issue and returns of books, CD's etc. can be done quickly and efficiently, so that it provides better services to users.

- The proposed system provides efficient management of inventory in the library.

- Redundancy is reduced; loss of data due to physical damages can be overcome by taking the backup and recovery from the proposed system.
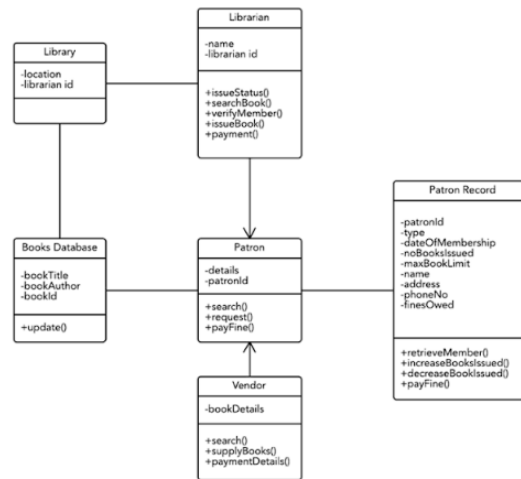
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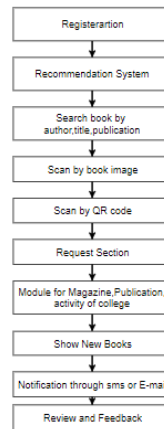
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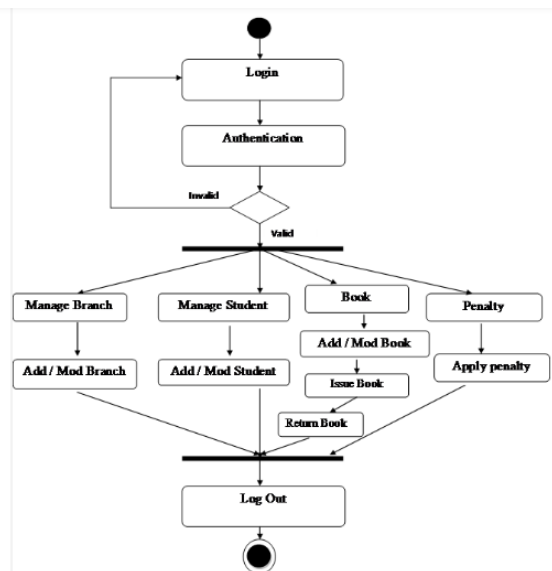
Class Diagram

Summary

This website provides a computerized version of library management system which will benefit the students as well as the staff of the library. It makes entire process online where student can search books; staff can generate reports and do book transactions. It also has a facility for student login where student can login and can see status of books issued as well request for book or give some suggestions. It has a facility of teacher's login where teachers can add lectures notes and also give necessary suggestion to library and also add info about workshops or events happening in our college or nearby college in the online notice board. 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. Our project is only a humble venture to satisfy the needs in a library. Several user friendly coding have also adopted. This package shall prove to be a powerful package in satisfying all the requirements of the organization.

Design and Implementation

This NFSL project having different module are as follows

Login : registered member can login to this system

Dashboard : Dashboard having summary of no of members, number of Admin, number of student and teachers, number of Borrowed books and number of returned books. So, user will get summarize itself.

Members : Admin can register member. So, only registered member only access this system so, member will be admin, student and teacher. So, we can import data through excel sheet also, and we can print member QR code and print member list for reference.

Books : In this module we can add , edit, delete and update book list and generate QR code for each book. So, in this book list will show all the book details like publication, number of copies, ISBN etc. In this also, we added new tab for old books, new books, lost books and damaged books, subject for replacement of books and hardbound books, So, user can categories each books for simplifying library process which is tedious task.

Admin: We can add new admin and update admin members from this module. It having search bar for searching desired admin member.

Member Attendance: We can take attendance of member in this system. When user can login to system then system can take attendance automatically for future reference. We can check attendance from and to date using date filters(Srearch by date login).

Conclusion

My proposed system will be a progressive web-app and mobile-app which will make the process fully online and hassle free it helps to reduce manual task in libraries. —

References

- Partiksha Mittra Department of Computer Science and Engineering Amity University Uttar Pradesh Noida, India pratikshamittra@gmail.com

- Nitin Rakesh Department of Computer Science and Engineering Amity University Uttar Pradesh Noida, India nitin.rakesh@gmail.com

- Danny C.C. PO0 Teck Kang TOH Glenn HONG School of Computing National University of Singapore Lower Kent Ridge Road, Singapore 119260

- Christopher S.G. KHOO Centre for Advanced Information Systems School of Applied Science Nanyang Technological University dpoo@comp.nus .e. sg Singapore 639798 . tohteckk@comp.nus .edu.sg

- Heru Supriyono Department of Electrical Engineering, Universitas Muhammadiyah Surakarta Surakarta, Indonesia Heru.Supriyono@ums.ac.id

- Muhammad Ramadhan Fitriyan Department of Informatics, Universitas Muhammadiyah Surakarta Surakarta, Indonesia ramright06@gmail.com

- Muamaroh Department of English Education, Universitas Muhammadiyah Surakarta Surakarta, Indonesia Muamaroh@ums.ac.id

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Student Name1:
Student ID1:

Student Name2:
Student ID2:

Student Name3:
Student ID3: