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Android based Mobile Library System

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***Abstract*—** The paper title "Android based Mobile Library System" is library management android application for monitoring and controlling the transactions in Information Technology department library. Generally, library staff handle a tedious task involve sorting, lending, returning, tagging, eyeing of books. In addition, library users encounter problems for finding, borrowing, localising, renewing the borrowing, queuing, and so forth. To overcome these obstacles, this paper proposes a smart library management system based on Android technology. The web server that will be used is an extremely low power draw, small form factor, no noise, solid state storage, small and lightweight server using raspberry pi. It will be used to store the data related to faculty and books, which will reduce the overall power consumption and cost of the server significantly. There is a uniqu facility is added to reserve books online in urgency and collecting later. Mobile library services are an integration of traditional library service and mobile communication technology, from which readers can enjoy library services anywhere and anytime. Through Mobile Library App System, the teaching and non-teaching staff of ou department would be able to easily check the book status, fasten th searching process to find their desired books or to use relevant services. Also, a notification system that push messages to mobile users about current updates by "Google Cloud Messaging" service.

Keywords- Android, Information and Communication Technology, raspberry pi, Google Cloud Messaging.

I. INTRODUCTION

Traditionally, library systems are implemented manually which is very costly, time consuming and tedious. Academic libraries in engineering institutions are prominent information organisations and play a crucial role in fulfilling the needs of the pedagogy. A college strengthens its educational level through the advancement of its library. Teachers, laboratories and libraries are important components in imparting effective engineering education to them. The aim of an engineering college library is to facilitate the engineering professionals in enhancing and updating their knowledge and skills, and to provide them information regarding new innovations, views, theories, engineering education, and research. This will in turn enhance the quality of teaching and upgradation of student's results. The primary role of engineering college library is to collect and organize recorded information in engineering and allied subjects to meet the needs of users. Information and Communication Technologies are increasingly used to collect, store, retrieve and promulgate a great amount of information to help engineering professionals. Information Technology has a profound impact on library operations, Information resources, services, staff skills development requirements and users' expectations. Information technology has virtually unlimited potentials for variety of useful applications in libraries as it significantly contributes to the improved quality, increased productivity, more efficient operations, better resource sharing and more effective services to the users. The purpose is to ease the transactions in the library, i.e., lending of books, storing of books, search engine for books, manage members of the library and secure the library system. Today the success of modern library is increasingly dependent on the most effective utilization and strategic management of new technologies in libraries.

It is analysed the awareness of the faculty and students in engineering colleges regarding the availability of IT components and their level of satisfaction on the basis of our survey.

Questionnaire-I (For Faculty):

1: General Information about the users.

2: Opinion of the users on library services.

3: Opinion of the users on E-Journals and Audio-visual materials.

4: Opinion of the users on Information Technology based services.

Majority of the faculty conceive that IT based services are better than manual services as they are having accuracy and consistency. It is very crucial to create library awareness among engineering college teaching and non-teaching staff

about the benefits of the library services that can be extracted online which was not there in the manual process. Greater approval was experienced by the users because Information technology tools are convenient , takes less time to search , users will get latest information on the subject and moreover they are accurate. Regarding E-Journals majority of the users opined that they are very much benefited because it is easy and convenient to search desired information on E-Journals and also it provides links to other related articles on the same subject. The Library makes an important contribution to the faculty's work, with a sizable percentage reporting that it makes a significant or major contribution to being a more productive researcher, keeping current in their field, finding information in new or related fields , and enriching student learning. Recent Developments.

- Shrinking Budget and Increasing prices of books and periodicals.
- Changes in Course Design.
- Changes in Teaching and Learning Methods.
- Decrease in Personal Book Purchasing.
- Obsolescence of information.

II. SURVEY

We took a survey of our faculty of IT Department of YCCE college. The aim of the study was to investigate the effectiveness of the computerized library system in order to support the continuous learning in various pedagogical settings. Primary goal is to compare the traditional and the computerized way such that the pros and cons are identified. The survey asked the faculty

- How frequently they visit the Libraries.
- The importance of various types of resources and finding aids for their teaching and research.

- The importance of specific information literacy skills to student success in their programs and about their assessment of student performance in these areas.
- The importance of a variety of library services to their teaching and research and their satisfaction with these same services.
- How useful four proposed services would be to their work.
- The contributions the Libraries make to various aspects of their work and their overall satisfaction with services, collections, and facilities.

Faculty were questioned about the importance of five skills related to finding, evaluating, and using information to undergraduate success. They also were asked about student performance in these same five skills. Large gaps exist between rated importance and rated student performance.

Faculty were questioned about the importance of these same five skills to graduate student success. Faculty also were asked about graduate student performance in these five skills. Faculty regard these skills as more important for graduate students than for undergraduates, and assess graduate student performance in these skills more highly than that of undergraduates.

The majority of the faculty responded to the survey report that they consider the digital Libraries to make significant or major contributions to their work in terms of their abilities to keep current in their fields, to find information in related fields or new areas, to be a more productive researcher, to be a more effective instructor, and to make more efficient use of their time.

The majority of the respondents indicate that the Departmental Library App will make a significant or major contribution to enriching student learning experiences.

The results of this survey indicate areas in which the Libraries can improve their support of faculty teaching and research. These areas include strengthening online collections, working with students to develop their information literacy skills, enhancing digital access to books, providing online tutorials for research tools, assisting with the integration of library materials and services into course management sites, assisting with open access issues, and renovating the Science &

Engineering Library engineers require not only adequate technological ability and problem solving skills, but also skills like cooperation, communication, and presentation skills, business ethics and interpersonal relationship.

III. RASPBERRY PI

The Raspberry Pi is a series of credit card–sized single-board computers developed in England, United Kingdom by the Raspberry Pi Foundation with the intent to promote the teaching of basic computer science in schools and developing countries. An extremely low power draw, small form factor, no noise, solid state storage, and other features make it an attractive solution for a small and lightweight server. The Pi draws about five to seven watts of electricity. This is about one tenth of what a comparable full-size box can use. The Pi uses an SD card for storage, which is fast and has no moving parts. There are numerous devices available for the Pi, all at very affordable prices. Everything from an I/O board (GPIO) to a camera and thus great expansion capabilities. Having the storage on an SD card makes it easy to swap with other SD cards running other GNU/Linux distributions to quickly and easily change the functionality of the Pi.

IV. ALERT METHODOLOGY

Google Cloud Messaging (commonly referred to as GCM) is a mobile service developed by Google that enables developers to send notification data or information from developer-run servers to applications that target the Google Android Operating System, as well as applications or extensions developed for the Google Chrome internet browser. It is available to developers free of charge. The GCM Service was first announced in August 2013 as a successor to Google's now-defunct Android Cloud to Device Messaging (C2DM) service, citing improvements to authentication and delivery, new API endpoints and messaging parameters, and the removal of limitations on API send-rates and message sizes.

V. IDENTIFICATION OF REQUIREMENTS

a. Functional requirements:

i. Librarian- Librarian can login and access the required information.

ii. Security- No normal user should be able to login except the librarian.

iii. Update member information- Updates of no. of books issued, any change in personal details

iv. Update book details- Librarian can add new book details, change the status of book(whether available or not available).

v. Book issue/return- This module enables to keep track of issued books and returned books details with date and time.

b. Non-functional requirements:

i. Security Requirements- Normal users can just read info, cannot modify anything except their details. System will have different types of users and every user has access constraints.

ii. Performance- Should be fast and accurate. System shall handle expected and unexpected errors in ways that prevent info loss and long downtime period. System should be able to handle large amount of data.

iii. User-friendly- the system shall be very interactive.

iv. Maintainability- Backups for database must be available.

VI. USE CASE

There are two actors, namely, user and admin. User can be teaching and non-teaching staff of the department.

User can search, reserve book, check the availability list and search for ebooks, whereas Admin can upload ebooks, slides, video lectures on different topics and subjects of the department.

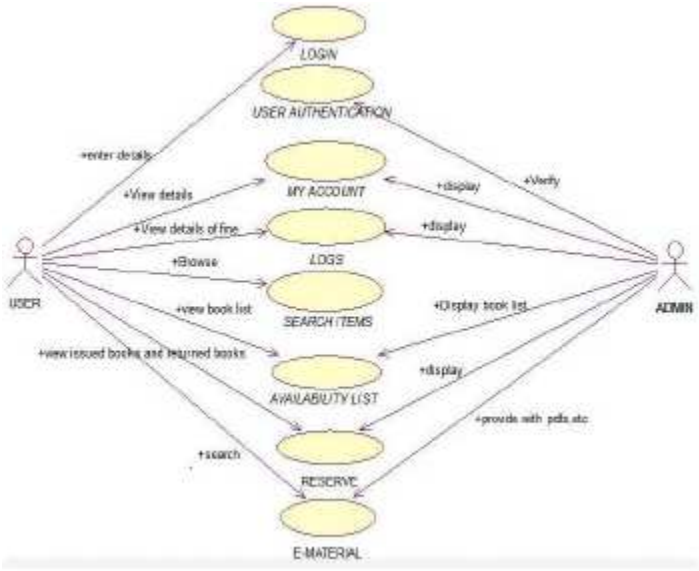
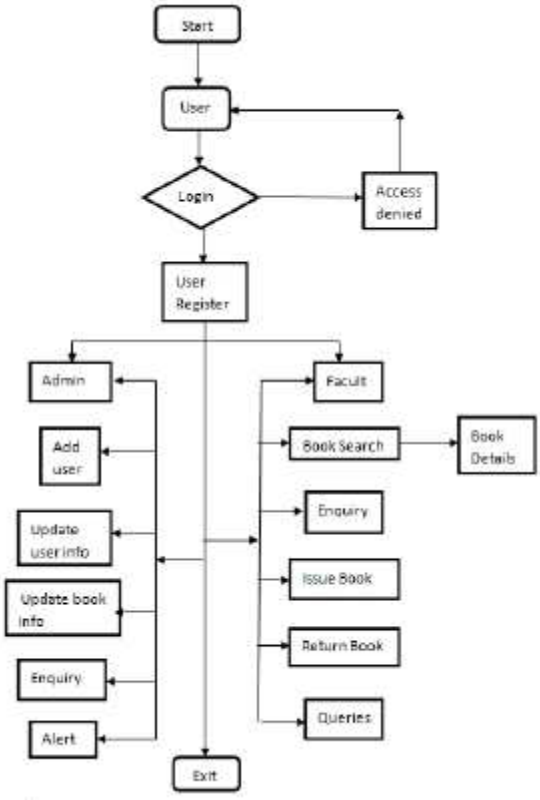


Fig- Use case diagram of Android based Mobile Library System

VII. FLOWCHART OF THE SYSTEM



VIII. CHALLENGES AND OPPORTUNITIES

From the survey results, the Library has identified areas to improve support of faculty teaching and research. These areas include:

- Providing abundant online collections
- Increasing collaboration with faculty to offer students more information literacy instruction.
- Enhancing digital access to books.
- Providing online tutorials for research tools.
- Improving integration of library resources with course management software

IX. SCREENSHOTS OF PRELIMINARY APP

IX. CONCLUSION

Library & Information Centre together would be able to provide uncompromising information and intellectual requirements to its users with a user-friendly approach through this android app. It will offer a fully integrated and dynamic environment for conducting academic study. Multiple copies will ensure that resources are easily available in Reference Section. Besides this, it will also provide the facility of reservation of books..

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