
LIBRARY SOLUTIONS USING QR CODE ENCRYPTION TECHNOLOGY

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1.ABSTRACT

Manual process of keeping student records, book records, account details, managing employee is very difficult. There are various problems which are also faced by the student in library such as finding any particular book, information whether book is available or not, for what time this book will be available, searching of books using ISBN number etc. To eliminate this manual system, library solutions using barcode encryption technology has been developed. This technology will handle all the current issues faced by the students and by its admin personnel.

The currently used software which is an open-source. They have to wait until they are not provided with their library card and token. For receiving book they have to show their library card and wait in line for their turns.

In the proposed system the transactions like login, add, search, delete, issue are provided.

The details of books like book name, book number, subject to which it belongs, author, edition, year of publication, the total number of books that are present in the library etc., are also stored. Only valid users will be able to access this software. The software is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain span of time. It also provides readily calculated reports such as the students will automatically receive an email before the last day of returning the book.

While issuing a book to a student the barcode of the book is scanned and checked whether the student can take the book or not, does he exceeds the limit of receiving the book and all. If all the conditions are satisfied then the student is issued with the book. This further doesn't require any library card of the student for issuing purpose as everything is pre-calculated and stored in the database.

2. INTRODUCTION

In modern world of technology, education and anything related to it has been shifted to computerized through an internet. The main aim of library solutions using qrcode encryption technology is to keep the book in the proper way with its complete details including writer and the student who is issuing this book. Everything is managed from the database. The database should be maintained in an efficient way so that the availability of the book and all the details are stored properly. The student doesn't require any card for issuing purpose. The system is automated in such a way that it can't allow each person to take more than three books. If the books which were took earlier are returned then only he/she can take another book. A reminder mail will be sent to the person who took the book a day before the return date. A new concept of book reservation is also been introduced in this system. A librarian has to manage all the library books details and keep a track on all the books that are issued. QR code is used to encrypt the details of the book.

3. Proposed work

In the proposed system the transactions like login, add, search, delete and issue are provided and only valid users will be able to access the software. The

software is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain span of time. It also provides readily calculated reports such as the students will automatically receive an email before the last day of returning the book. While issuing a book to a student the QRcode of the book is scanned and checked whether the student can take the book or not, does he exceeds the limit of receiving the book and all. If all the conditions are satisfied then the student is issued with the book. This further doesn't require any library card of the student for issuing purpose as everything is pre-calculated and stored in the database.

4. System architecture



Fig System Architecture

The librarian and admin can use the software. The operations are done on daily bases and are stored in the database which can be retrieved anytime.

5. Algorithm

QRcode (abbreviated from **Quick Response Code**) is the trademark for a type of matrix barcode (or two-dimensional barcode) first designed for the automotive industry in Japan. A barcode is a machine-readable optical label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data; extensions may also be used.

The QR code system became popular outside the automotive industry due to its fast readability and greater storage capacity compared to standard UPC barcodes. Applications include product tracking, item identification, time tracking, document management, and general marketing.

A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera, and processed using Reed–Solomon error correction until the image can be appropriately interpreted. The required data is then extracted from patterns that are present in both horizontal and vertical components of the image.



The amount of data that can be stored in the QR code symbol depends on the datatype (*mode*, or input character set), version (1, ..., 40, indicating the overall dimensions of the symbol), and error correction level. The maximum storage capacities occur for 40-L symbols (version 40, error correction level L)

The format information records two things: the error correction level and the mask pattern used for the symbol. Masking is used to break up patterns in the data area that might confuse a scanner, such as large blank areas or misleading features that look like the locator marks. The mask patterns are defined on a grid that is repeated as necessary to cover the whole symbol. Modules corresponding to the dark areas of the mask are inverted. The format information is protected from errors with a BCH code, and two complete copies are included in each QR symbol.

The message dataset is placed from right to left in a zigzag pattern, as shown below. In

larger symbols, this is complicated by the presence of the alignment patterns and the use of multiple interleaved error-correction blocks.

6. Result analysis

The role of librarian is 35% as he stores the data, issues the books and deletes the data in database upon successfully receiving the book from them.

The role of admin is 65%.the entire system is monitored by the admin. The mails are sent by the admin.

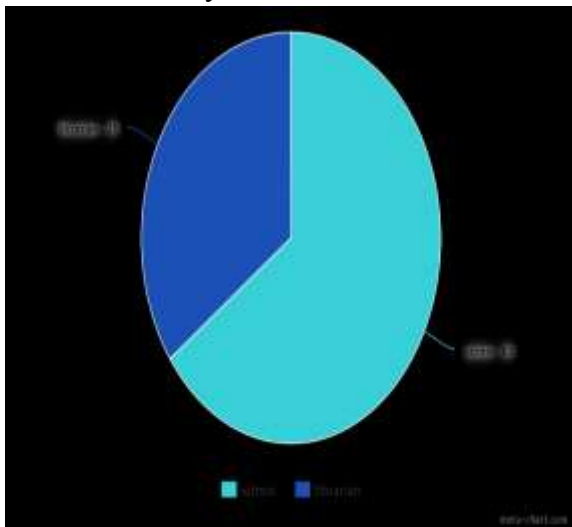


Fig: Result Analysis

7. Conclusion

In this paper we study that the library solutions using QR code encryption technology allows the user to store the book details and the student/faculty details. This software package allows storing the details of all the data related to library. The system is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over

a certain span of time. The implementation of the system in the organization will considerably reduce data entry, time and also provide readily calculated reports. The process of sending mails automatically to the people regarding books helps the returning process easier.

8. Future Enhancement

As for now the application is designed to send mails to the people for returning the book as well as reservation of books. In future it can be enhanced by using SMS services.

References

1. Adamson, Veronica, et al. (2008). "JI SC& SCONUL Library Management SystemsStudy" (PDF). (1 MB). Sheffield, UK: Sero Consulting. p. 51. Retrieved on 21 January 2009. "...a Library Management System (LMS or ILS 'Integrated Library System' in US parlance)." Some useful library automation software are: KOHA, Grenstone .LIBSis, and granthlaya.
2. **Jump up**^ Tennant, Roy (16 April 2008). "Picking When to Jump, Part 2". Library Journal. Reed Business Information. Retrieved 20

- January 2009. Across the pond they use the term library management systems (LMS) for what we call the integrated library system (ILS).
3. ^ Jump up to:^{a b} Wallace, Patricia M. (1991). Gary M. Pitkin, ed. Library Systems Migration: An Introduction. Westport, CT: Meckler. pp. 1–7 [3]. ISBN 0-88736-738-0.
 4. ^ Jump up to:^{a b c} Wallace, Patricia M. (1991). Gary M. Pitkin, ed. Library Systems Migration: An Introduction. Westport, CT: Meckler. pp. 1–7 [4]. ISBN 0-88736-738-0.
 5. ^ Jump up to:^{a b} Kochtanek, Thomas R. (2002). "1 - The Evolution of LIS and Enabling Technologies". Library Information Systems: From Library Automation to Distributed Information Access Solutions. Westport, CT: Libraries Unlimited. p. 4. ISBN 1-59158-018-8
 6. "SCVNGR Unveils QR Code Payment System".
 7. "FAQ - Bitcoin". Retrieved 10 September 2015.
 8. "Blockchain.info - Bitcoin Wallet - Features". Retrieved 10 September 2015.
 9. "Google testing login authentication via QR codes".
 10. Michael Keferl (20 March 2008). "QR code graves give a "Memorial Window"". Japan Trends. Archived from the original on 2 May 2012.
 11. "Quiring Monuments adds smartphone codes to gravestones". Puget Sound Business Journal. 26 April 2011. Retrieved 10 September 2015.