

Integration of AIDC Technology in Mobile via QR Code for Enhancing the Library Services: A Case Study of Don Bosco College Central Library, Arunachal Pradesh

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(Received 15 March 2019; Revised 2 April 2019; Accepted 15 April 2019; Available online 20 April 2019)

Abstract - In this digital era, QR Code is becoming one of the most popular tools and it great help to website towards strengthening the relationship and promoting enhanced to existing library website. Q R Code is a state of art AIDC technology that is gaining popularity with Library fraternity in India. It is one such technology which can offer to the user demand of providing access to e-resources through mobile. These advanced technologies offer access very convenient, instantaneous information, across boundaries of subject and particular area. Don Bosco College Central Library is set an example in experimenting with adopting new technology developments; where it is computerization and automation or adopting other ICT to improve facilities their services. The rapid developments in ICT have given a solid foundation for revolutionary changes in the information handling capabilities of information dissemination. Don Bosco College Central Library may well reach out to the remote users who were considered unlikely to connect because of absence of a medium. Users are becoming increasingly web savvy reliant on advance technologies for sharing, accessing and determining their information. Keeping in mind, researcher integrated AIDC in Mobile via QR Code Technology in Don Bosco College Central Library Website for enhancing library services.

Keywords: QR Code, AIDC, RFID, Bar Code, OCR, Digital Library

I. INTRODUCTION

AIDC technology can be used in different day to day library activities like self-check in, check out, self-rectification, making library card, self-management, anti-theft detection, CAS, SDI, and stock verification etc. Automatic identification offers quickly, accurate and easy for data collection approaches. Once data is captured it can be stored or analyzed by a computer or other device. AIDC techniques in usual do not require human involvement in order to capture data, these methods comprise technologies namely biometrics, QR Code, barcodes, OCR, OMR and RFID etc. This information can be used for control functions relevant to the specific items as well as for automatically identification item's conditions and decision making if it's needed.

Don Bosco College, Itanagar (Jollang) is an educational institution of the Catholic Church, belonging to and managed by the Salesians of Don Bosco Educational Society (registered under the Societies Registration Act of

1890: No.50 SR/ITA/4034). The College is named after St. John Bosco (1815 – 1888) popularly known as Don Bosco – Father and Friend of Youth. He was a Catholic priest and a prominent educationist engaged in the welfare of youngsters. (Source: <https://dbcitnagar.com/>)

II. AUTOMATIC IDENTIFICATION AND DATA CAPTURE (AIDC)

“Automatic Identification and Data Capture (AIDC) refers to the methods of automatically identifying objects, collecting data about them, and entering that data directly into computer systems (i.e., without human involvement)”. (Source: https://en.wikipedia.org/wiki/Automatic_identification_and_data_capture)

A. Advantages of AIDC Technology in Library

AIDC makes it easy to identify and find out the exact books search by user and helps to stock verification and self-rectification.

1. AIDC enables real-time monitoring of the number of books issued out & returned transaction in a day.
2. It eliminates errors associated with identification and data collected by AIDC harvests information about the location of Books Shelves as well as open space available for storage.
3. It reduces data entry costs and save valuable time of reader to find out the book as per their requirement books.

B. AIDC Technologies

There are several types of AIDC technology using in library.

1. *Bar Code Technology:* Barcode technology is an appropriate technique in library to minimize the time taken at the circulation counter in library. Barcodes used for issue/return of books libraries and have to resort to stock verification, at intervals. If the delivery for multiple barcodes or multidimensional barcoding is integrated to handle call number information also,

wrong shelving of library books can be auto detected which would support the staff to rectify the same.

2. *Biometric Identification – Fingerprint, Retinal Scan or Voice:* Biometrics technology in libraries regularly comprises of fingerprint identification software and hardware. A fingerprint-based door locks & hand geometry verification system. Biometric system can be used successfully such as circulation section, gate checking, internet searching, stack entry record, using digital library, employee time and staff attendance etc. With the help of Biometrics technology, it can easily be introduced in the library full proof security cum automated library and user authentication system in library successfully. It can acts as a helpful management tool for the library professionals if it is use in library patron records very quickly, accurately and systematically in scientific way.
3. *Magnetic Strips & MICRs:* MICR stands for Magnetic Ink Character Recognition. These applications used in mainly in banking sector but very limited application in libraries. MICR is frequently used in user ID cards. It helps the security systems at the entrance to allow only the authorized users in and get the material issued to them.
4. *Optical Character Recognition (OCR):* Optical character recognition or optical character reader, often abbreviated as OCR. OCR used to convert the existing resources in documentary form (printed) to digital form such as PDF. The books, magazines and periodicals etc. are scanned using some optical reader and saved in digital format either in computer itself or onto some secondary storage device like floppy or CD. OCR is very useful technology to digitize documents and books in digital libraries.
5. *Radio Frequency Identification (RFID):* RFID stands for Radio Frequency Identification. It is used in libraries for book identification, for self-in/self-checkout, anti-theft control, inventory control, and sorting and conveying of library books and AV materials.
6. *Real Time Locating Systems. (RTLS):* RTLSs used automatically recognize, track, and visualize objects that are usually within indoor or confined environments mainly using RF identification (RFID).
7. *QR code Technology:* QR code stands for Quick response code. It is a matrix barcode readable by smart phones and android phones with cameras. It is sometimes mentioned to as 2d barcodes, 2d codes, or mobile codes. It allows four different content types, text, a URL, SMS or phone number and a choice of four sizes— large, or extra-large, medium and small. Generating a code is as simple as choosing a content type, adding URL or other data, and clicking the

“generate” button. It is instantly generated and can be saved, copied or embedded.

III. DON BOSCO COLLEGE CENTRAL LIBRARY WEBSITE

Don Bosco College Central Library provide a unique platform for promoting various library services like new arrival journal, new arrival books, download corner, feedback corner, faculty corner, student career corner, virtual learning corner, civil service preparation, free online plagiarism checker, free online citation and many more at one place. Students are the future of our nation and researcher believes that this website will help and bring them to reach their goal of their life with distinction and maintain the integrity of the career by accomplishment of their knowledge though this virtual forum.

IV. SCOPE AND COVERAGE OF THE STUDY

The scope of the present study is limited to the Don Bosco College Central Library website QR codes which are used for dissemination of information to their users.

V. OBJECTIVES OF THE STUDY

The objectives of present study are:

1. To create awareness about the QR code.
2. To recognize the installation process of QR code.
3. To know the process of QR codes generation.
4. To analyze the services given by Don Bosco College through QR code.

VI. METHODOLOGY

Researcher adopted qualitative research methods for the purpose of case study. The present study examine applies, issues and implementation of the same technologies in a particular website. The present paper discussed with an introduction, area coverage, objectives, its advantages and disadvantages and generating Q R Code, promoting services in website and library.

VII. LITERATURE REVIEW

Mishra (2017) discussed & examined that a library user can easily get information regarding library collection, e-resource, library web site, Web-OPAC in a user-friendly environment. Number of libraries adopted this technological code to spread information worldwide. Library's information professional using this technology without any dependency. Many QR code generator also available to generate QR Code for library collection, architecture design of library building, e-books, visiting cards, bookmarks, user manual or blog.

Pathak (2017) revealed that QR codes in providing Current Awareness Service/Ready Reference Service like library website, Web OPAC, list of Ph.D. theses, e-Resources,

book requisition / library membership form, digital payment for library book overdue, list of CD-ROMs, library guide, library manual, institutional digital repository (IDR), open access resources, union catalogue of e-resources, new arrivals, list of print magazines, discovery tool service & List of News Papers etc. used in central library, IISER Bhopal.

Rahaman (2016) observed that Central Library, NIT, Rourkela started using QR code for many purposes like, in the banners of the workshop, training, seminar, conference, induction programmes; advertisement; notices; websites; URLs etc. not only in the webs but also in the printed forms too.

VIII. QR CODE

QR code is used in a variety of ways by different organizations for their personal purposes like promoting and marketing the products. Library uses it as a medium to communicate the users to their documents/information that they want. The 21st century libraries are fully automated and they know the users' demands. They always try to provide world class services to their users beyond physical boundaries. There are many libraries abroad that have implemented QR code. With the advent of ICT and awareness of technology among people, QR codes are being used everywhere. So QR codes can be used in library books, journals, CD-ROMs, ticketing, entertainment and transport ticketing, VCard information, commercial tracking, product/loyalty marketing and in-store product labeling. So we can say that QR code can be used in a variety of ways as per need. (Parabhoi & Dhar 2017).



Fig. 1 Different QR codes used in Don Bosco Collage Library

A. Advantage of QR Code

1. It is always available free of cost in web;
2. It can hold much more information than a regular barcode and can be used anywhere at any time;
3. QR Code is user friendly technology and users do not need specific expertise for using this technology, only required smart phones like Android phone, iPhone, etc. with QR code scanner;

4. It increase the users satisfaction and useful to achieve the fulfill library goals of Ranganathan fourth law i.e. save the time of reader;
5. Anybody can generate the QR code using free software;
6. It is used in promoting the library services like DDS, SDI and quick reference services etc.
7. It helps human errorless when a person particularly search the web.

B. Disadvantage of QR Code

1. It requires an internet connection along with smart phone, android phone, Desktop (with camera) and QR code scanning software;
2. Still users are not fully awareness. Awareness among users toward QR code technology is also very essential to fulfill effective website & library services;
3. Human errors occur sometimes at the time of coding;
4. Q R Codes are not working properly sometimes due to the compatibility of the decoder.

C. Requirements for Scanning QR Code

1. Internet connection (either through the phone's data plan or over a site generated wireless network);
2. Smart phone, Android, Desktop (with Camera) with QR Code reader/scanner ;
3. Handy scanner/handy terminals/fixed scanner;
4. Printer;

D. Process of Generating QR Codes

It is very simple process of generating QR Codes. There are a number of free QR code generators easily available on the web. There are two types of QR Code (One is static and second is dynamic). Static QR codes cannot be edited at any time after generating the code which is one type job but dynamic QR codes which is editable even after printing as per our need.

First step, one need to select QR code generator website (ex.: <http://www.qr-code-generator.com>)

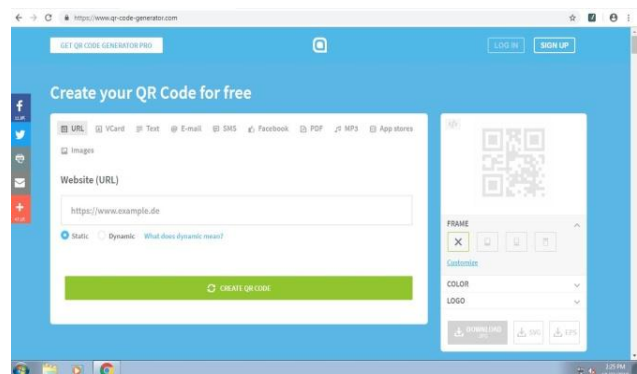


Fig. 2 Selection of QR code generator website

Second step, need to select one of the desire & require navigation tools (like URL, VCard, Text, Email, SMS, Facebook, PDF, MP3, App stores & images). Here,

researcher choose own URL of Library Science Professionals website for demonstration purpose.

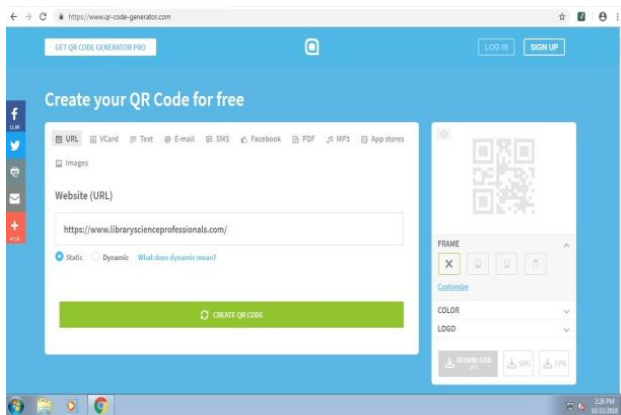


Fig. 3 Select of desire & require navigation tools

Third step, uploading the desired document (ex. URL) and click at next or if require additional feature require then can do color frame. Otherwise, normally do black and white color or click at done/create QR code.

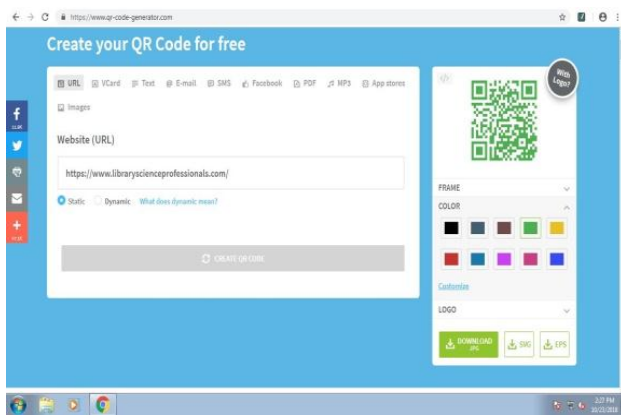


Fig. 4 uploading the desired document

Fourth step, if require any additional feature then can do color logo. Otherwise, normally do black and white color or click at done/create QR code.

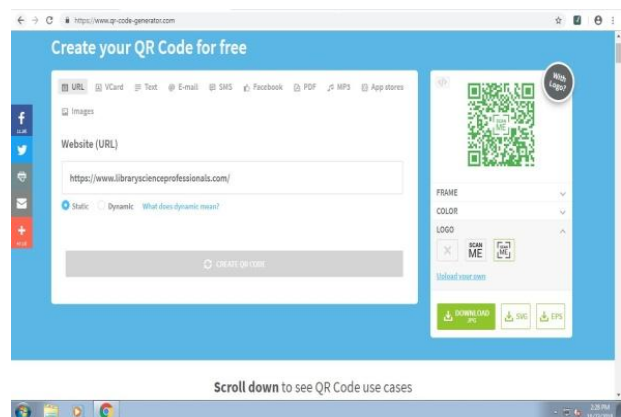


Fig. 5 Steps to add additional features

Fifth step, now file is ready to download and save.

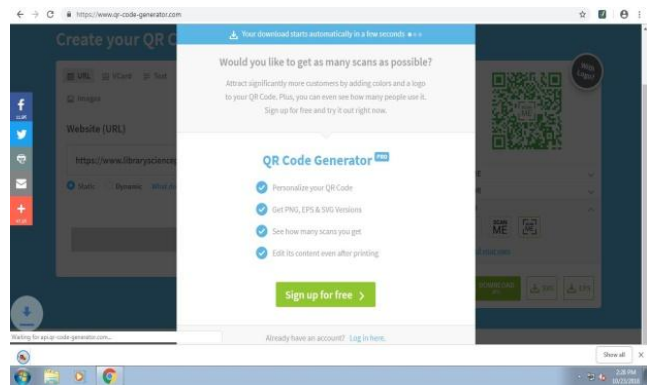


Fig. 6 Final Step to generate QR code

E. Manual of Using QR Code in Don Bosco College Library Website

1. First step, go to mobile android (Google Play Store).

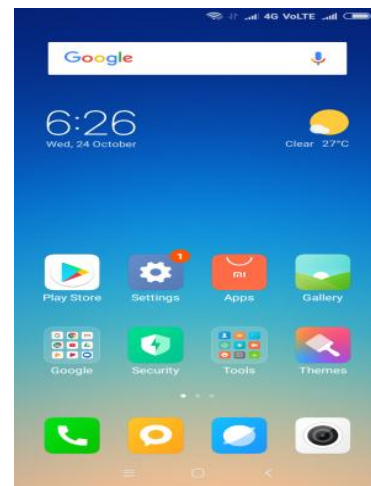


Fig.7 Step-1

2. Second step, search & download (free Q R scanner app).

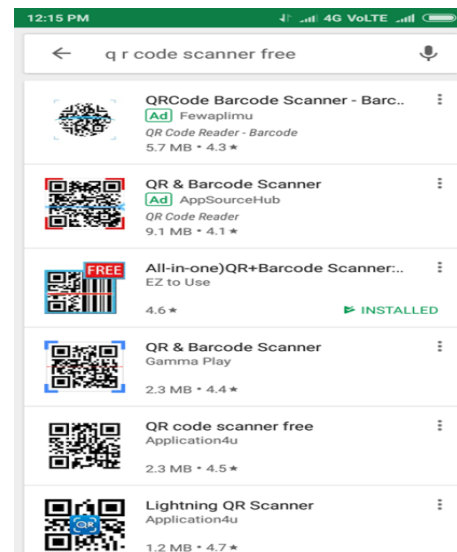


Fig.8 Step-2

- Third step, after completing the download (install the Q R Code Scanner App) successfully.

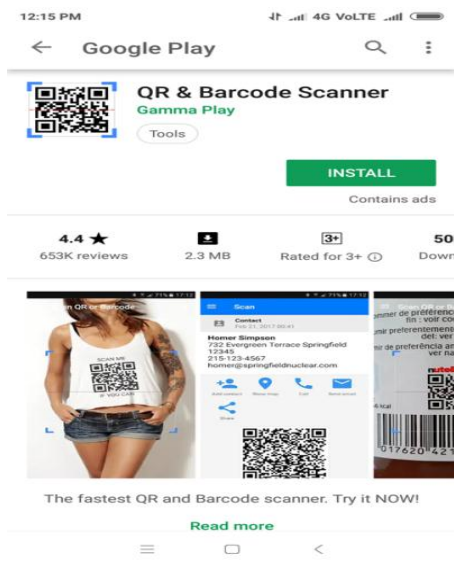


Fig.9 Step-3

- Forth step, scan the following Quick Response Code (QR Code) & open this website in your smart phones. (Ex. <https://www.librarydbc.com/>)



Fig.10 Step-4

IX. CONCLUSION

In the present digital era, use of internet through mobile phones, smart phones, and tablet PCs have been increased extremely among younger generation all over the world. QR codes & their effective use in library services can enable the popularity the libraries, bridging the digital divide. Use and integration of QR Code in existing Don Bosco College Central Website is the need of the present era. Interaction with the professionals can be achieved and fulfill due to advancement technology. The challenge of Don Bosco College Central Library website is to create and convincing information services and to make digital content obtainable

in such way that users will find not only satisfactory, but tailored to their needs. The Q R Code revolution compromise both challenges and prospects for researcher. Researcher efforts will support and attempt to entice new users, expand the usage of existing users, and highlight specific library products also.

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