

Quick Response (QR) Codes Connecting Library Patrons to Information Resources Anytime Anywhere

Ravi N. Bellary

Deputy Librarian, NMIMS (Deemed to be University), Vile Parle (W), Mumbai, Maharashtra, India
E-Mail: rnbellary@gmail.com

Abstract - Change management in the library and information centre is very much essential. According to forth law of Dr. S. R. Ranganathan's library science, save the time of the reader and it is necessary for library and information science professionals to adopt new technologies in the library and information centre to provide effective services to its user and save their precious time. In this study, efforts have been made to know the application of Quick Response (QR) codes in the library and information centre and how it works to disseminate information to its user's community.

Keywords: Academic library, QR Codes, Quick response, Change management, Barcodes, Technologies

I. INTRODUCTION

Today the applications of Information and Communication Technologies in the library and information centre have made a lot of impact on quality of services, functions and resource management. The main functions of an academic library like selection and collection of library resources, process, storage, retrieval and dissemination of information have been continuously changing. The Information and Communication Technologies also made revaluation in the publishing industry. Nowadays information is available in the various format. It is very difficult for the library and information science professionals and users to identify the right information resources in a faster way. The library and information science professionals should select prime gadgets for the academic library to disseminate the exact information to the needy users in time and reducing the gaps between information and its users.

The digital information resources play a prominent role in facilitating access to the required information to the users in an easy and expeditious manner (Anjaiah, 2013). Through QR Codes we can provide access to electronic information resources. The Quick Response Codes are popularly known

as QR Codes which are very useful to disseminate information anywhere anytime to the users through URLs. The QR Codes is an improvised version of Barcode and it can be read through the smartphones and tablet possessing a camera with reader software.

II. QUICK RESPONSE CODES

QR Codes are widely used in all fields to deliver the information to the end users. QR Codes was designed by Denso Wave Incorporated, a Japanese Company which is a member of Toyota group in the year 1994 to store product information (Furht, 2011). But, nowadays it is used to store almost anything, including URLs, GPS coordinates, addresses, contact information, phone numbers, greetings, and simple text messages. QR Codes provide an easy way to store and transfer information. According to Research and markets offers report (2011) QR codes are square, 2D barcodes containing alphanumeric text, that can be decoded, or read by a smartphone with the use of a reader software with a camera (See Fig.1) and the required information can be accessed immediately on-the-spot. Each QR code is structured by dark (logical "1") and light (logical "0") modules. The modules are evenly distributed in a square net of fields, where the size of a field is the size of a single module. By the standard ISO/IEC18004 one module should be sized 4×4 pixels with the print resolution of 300 dpi (dots per inch) (Tarjan et. al., 2014). It act as an alternative way to read information into the phone so the user doesn't have to manually type any information, it is effectively bridging the gap between the real and the digital world. Users can keep digital archives of needed information on their smartphone and go back at any time to access previous information.

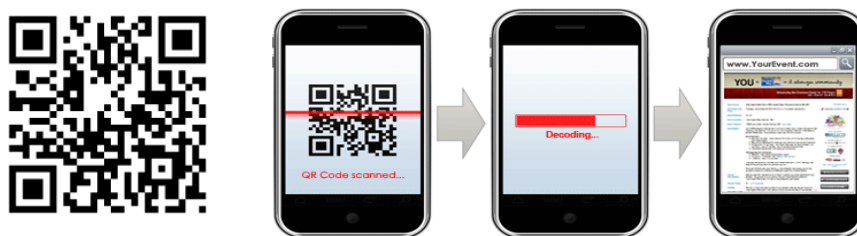


Fig.1 QR Code and it is ready by smartphones with help of software

Source: <https://www.runningguru.com/RaceDirector/QRCodeInfo.asp> (retrieved on June, 20 2018)

QR Codes carry information on both side i.e. vertical and horizontal so it is called as two dimensional. Today the QR Code technology is widely used by many academic libraries for providing quick access to their resources to the users in smartphones or tablets.

III. QR CODES VS BARCODES

There is a huge difference in QR Codes and Barcodes such as QR Codes are two-dimensional codes whereas Barcodes are one-dimensional codes. The QR Codes provide information on vertical as well as horizontal, but barcode carries only horizontal. The QR Codes carry information in a smaller space compared to a barcode. The QR Codes used to get information on a particular entity like music, books, image, text, etc., and the barcode is a security code of a product like information of an entity or a user. The QR Codes scanned by smartphones, whereas barcode required a barcode reader. The Internet connection is essential to get information from the QR Codes. The QR Codes are presented in a square dots on a square grid (See Fig.1), the barcode is vertically arranged lines.

IV. ADVANTAGES OF QR CODES

QR Code is one of the important tools to disseminate information in digital format. The main advantages of QR Codes are as follows.

1. Various types of entities information can be accessed like music, image, text, message, etc.
2. It can be used anywhere, anytime and on anything.
3. It is very economical.
4. It can hold more and different data.
5. Instant information on everything with error free.
6. Easy to replay of damaged labels.
7. Anyone can generate the QR Codes and use on required source or product.

V. HOW QR CODES WORKS

To generate QR Codes we need high-quality software which is freely available on the Internet. After selecting software we need to find out what kind of information has to be disclosed to the users. After selecting required information to enter data in the form that appears after that download a dynamic QR codes. If required customise the QR codes after testing to make sure it is scanning and providing proper information to the end users. Walsh (2009) recommended some of the QR code readers/generators in the study - BeeTagg - www.beetagg.com, I-nigma - www.i-nigma.com, Kaywa - www.kaywa.com, Neoreader - www.neoreader.com, Nokia Barcode Reader - <http://mobilecodes.nokia.com/>, QuickMark - www.quickmark.cn/, Upcode - www.upc.fi/en/upcode/, Zxing - <http://code.google.com/p/zxing/wiki/GetTheReader> and QR code.com.

VI. TYPES OF QR CODES

Based on the purpose and holding capacity of QR codes, the Denso Wave Incorporated has identified five types of QR

Codes in their website QR Code.com i.e. 1. QR code Model 1 & Model 2, 2. Micro QR code, 3. iQR Code, 4. SQRC and 5. Frame QR code.

1. *QR Code Model 1 & Model 2*: The Model 1 is the original version. It is largest i.e. 14 (73 X 73 modules), which is capable of holding up to 1167 numbers. The Model 2 is an upgrade version of Model 1 with the largest version 40 (177 X 177 modules) which is capable of holding up to 7089 numbers.

2. *Micro QR Code*: It is smaller version size, this code is M4 (17 X 17 modules) which can store up to 35 numerals and only one orientation detecting pattern is required to read this code.

3. *iQR Code*: The iQR Code generated in the square or rectangular model and it can hold less space. This code is 61 (422 X 422 modules) which can hold about 40000 numbers.

4. *SQRC*: This type of Codes has a restricting reading function and there is no difference between QR Code and SQRC but it consists of a public part and private part. It is widely used to store private information and organisations internal information.

5. *Frame QR Code*: The Frame QR code is available with a canvas area it can be flexibly used. In Canvas area we can use images and letters. This is used to promote business and attract the customer's eyes without losing the illustration, photos etc.

VII. THE IMPLICATION OF QR CODES IN THE ACADEMIC LIBRARY

The QR Codes are introduced in many academic library's sources and services such as library WEB-OPAC, access to online databases, information of print/non print periodicals, promotion/marketing of library products and services, library orientation, new arrivals, link to video/audio files, well known personality lecture series, films, library guide etc. The below paragraphs shows the various Indian academic libraries introduced QR Codes in their library to provide instant information to their patrons.

1. *Anjuman-I-Islam's Kalsekar Technical Campus, New Panvel*: Institute was established in the year 2011. The library has introduced the QR code to provide access to Wi-Fi network, library WEB-OPAC, new arrivals, question papers, periodicals and online resources like journals and books.

2. *Indian Institute of Science Education and Research, Bhopal*: The Indian Institute of Science Education and Research established in the year 2008. The Library has the rich collection of various resources. The library has introduced QR codes to access library OPAC, library website, Ph.D. Theses, e-resources etc.

3. *Narsee Monjee Institute of Management Studies (Deemed to be University), Mumbai*: The SVKM'S Narsee Monjee

Institute of Management Studies was established in the year 1981. The central library is known as Prof. Y. K. Bhushan Information & Knowledge Resource Centre, it has the very good collection of print and online resources to cater the needs of library users. The centre is introduced QR Codes to access library OPAC and subscribed online research databases.

4. *National Institute of Technology Karnataka, Surathkal*: It was established in the year 1960. The library has an excellent collection of books, periodicals and other reading materials. The QR Codes introduced to access library WEB-OPAC, ask your librarian, access to e-resources, new arrivals, and for e-books.

5. *National Institute of Technology, Rourkela*: It was established in the year 1961. The central library is known as Biju Patnaik Central Library. The library has introduced QR Codes to provide access to OPAC, 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 also.

6. *Pune University, MBA Department Library, Pune*: The department was established in the year 1971. The library has various resources to cater the needs of MBA faculty members and students. The library has introduced QR codes in 2013 to provide access to print journals, books and university song.

VIII. CONCLUSION

In order to make the library more relevant to use, library professionals should think about new technologies which are more convenient to adopt and user-centric. The QR codes are very much essential in the academic library to fast communication of information. These codes carry messages, text, image, songs, URL links, etc. We can also

use it to link print periodicals to their online access also. With help of QR codes, faculty members can access the resources materials from the publisher's websites. The library and information science professionals can use these codes to access trade catalogue and library resources selection tools.

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