

Use of QR codes in Library and Information Science teaching and research

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Abstract:

This paper reports an attempt made in the Dr. Ranganathan Institute of Library and Information Science (DRILIS), Bundelkhand University (BU), Jhansi towards use of QR codes as part of offocused, methodical, and evaluative approach to emerging technologies in LIS teaching and research. Details about QR codes, its generation and the areas where QR codes are implemented in DRILIS are discussed. The paper ends with discussing some of the lessons learnt during the implementation of this initiative.

Introduction

Mobile devices are ubiquitous and are very popular among the young generation. Among the mobile devices, smart phones are the most popular devices as per recent market studies. Library and Information Science(LIS) students are neither exception to this, in fact in the present class of LIS students 30% have smart phones. This is inline with a 2009 ECAR study of undergraduate students and information technology of United States, found that 51.2 percent of respondents owned an Internet-capable handheld device, and another 11.8 percent planned to purchase one within the next 12 months(Smith, Salaway, & Caruso, 2009). On the other hand, most students have only option of reading e-resources on mobile devices, as most of the LIS students do not have other electronic devices like laptop or PC. Analogously, shift towards Mobile site creation by academic institutions, easy social network access, and the growing number of popular mobile apps, points to the likelihood that more students will opt for the convenient and useful data available to them via handheld devices(Ashford, 2010).

This paper reports an attempt made in the Dr. Ranganathan Institute of Library and Information Science (DRILIS), Bundelkhand University (BU), Jhansi towards use of QR codes. DRILIS, BU, Jhansi is a prestigious library school in middle India. The institute offers BLibISc, M.Lib.I.Sc., MPhil(LIS) and PhD in library and Information Science courses. The institute has established itself as lead provider of competent, qualified and quality trained professionals. The products of the institute are working in national and state level libraries all over India at various capacities. This pilot project is part of focused, methodical and evaluative approach to application of emerging technologies in teaching and research activities of the institute.

About QR codes

Quick Response(QR) codes, a type of barcode, are beginning to make inroads in India. They are still unknown, but early adopters such as marketing campaigns and advertisements are creating some impact and generating awareness about QR codes. QR code is more embraced by higher educational institutions than barcode(Ashford, 2010; Hoy, 2011; Lombardo, Morrow, & Le Ber, 2012). It is important to understand the uses and benefits of QR codes in teaching and research.

QR codes were developed in Japan in 1994 by a Japanese corporation Denso Wave, a subsidiary of Toyota. These were developed as an improvement to the existing barcodes for application in inventory management. Denso Wave freely shared the idea for the codes with others. QR code technology is in the

public domain; Denso Wave released QR codes freely instead of licensing the technology(Wave, 2015).

QR (for "quick response") codes are a type of two-dimensional barcode or data matrix, where data are coded based on the position and combination of black spots within a white matrix. The QR code is a matrix barcode readable by smartphones and mobile phones with camera. Unlike barcode, there is no requirement for buying a separate barcode reader device. They are referred to as *QR* because they allow the contents to be decoded at high speed. QR codes can hold much more information than a regular barcode. QR codes can be encoded to transmit many types of information and some QR code creation sites can handle more types of content than others. A few standard examples of the types of information that can be shared using QR codes include:

- Any text: Include a message up to 250 characters long.
- URLs: Link to mobile optimized web pages, or shortened URLs.
- A phone number,
- an short message service (SMS) messages,
- a V-card: a format for visiting card information.
- an email message with pre-written Subject: and To: fields.

Generating QR codes:

As QR code is a public technology, several free QR code generators are available. The QR codes can be generated using QR code generators. An easy-to-use Google Chrome QR code extension allows one to create a QR code while visiting any URL in one easy click.

In DRILIS, i-nigma QR code generator was used("i-nigma create barcodes QR DataMatrix," 2013). The web page of QR code generator allows four different content types, a URL, text, phone number, or SMS and a choice of four sizes small, medium, large, or extra-large. Code generation is very easy, first the content type has to be selected, then the data is added after wards clicking the "generate" button will generate QR code. The created QR code can be copied, saved, printed or embedded in a webpage. The QR codes were then printed on papers and pasted at appropriate places in the DRILIS.



Figure 1: QR code- encoded with author's email-id

Application areas in LIS teaching and research

In all over the world, academic institutions, research centers, universities, liberal art institutions are experimenting and discovering useful ways to implement QR codes(Walsh, 2011). In India also, although QR codes are a relatively new technology, several institutions are using them. The QR codes provide simple connections between print and virtual resources(Kane &Schneidewind, 2011).Wells (2012) used QR codes to link students to music collections. QR codes could be used to provide information and access to the electronic resourceseither subscribed through the library or available elsewhere.

Following applications of QR code is done in DRILIS, BU, Jhansi.

- Printing QR codes on printed reading lists, scanning the QR codes students were able to connect directly, as accurate hyperlinks were available to click unlike typing them in the address bar.
- Job placements, direct links to job vacancies, or notifications were encoded in QR code format and were printed on paper and were displayed on the “Placement Notice Board” this helped students to get important updates for job placement notifications.
- Displaying QR codes for class schedules, by scanning QR codes the students were able to import the time-table or class schedules in calendar application of their devices and further able to receive notifications or set reminders.
- QR codes were placed at appropriate pages on the copies of DDC, UDC, and CC available in the DRILIS, these copies are used at the time of teaching classification and practicing classification by the students. These QR codes were encoded with URLs of webpages having detailed explanation with appropriate examples. For example, use of tables in DDC and auxiliaries in UDC.
- Similarly, QR codes were placed at appropriate pages on the copies of AACR2R and Classified Catalogue Code(CCC), these copies are issued to the students while teaching cataloguing practice. These QR codes were encoded with the URLs of webpages having detailed explanation with appropriate examples. For example, choice of headings, access points, rendering.
- For teaching information sources and reference sources paper, the URLs of the webpages of the resources were encoded with QR code. These QR codes were printed on papers and distributed at the time of teaching. This practice helped the students to get updated information about the reference source and were helpful in proper evaluation of reference sources.
- For teaching IT applications papers, the URLs of famous library OPACs are encoded and printed on paper and distributed to students. Similarly, the demo websites of library specific software such as, DSpace and KOHA were encoded in QR codes and were distributed to the students. This helped the students to try software and do customizations as required off the class timings.
- All the faculty members hosted their classroom presentations on websites like Dropbox or Google drives and then generated the QR codes of the public URLs. These QR codes were then pasted on the notice board. This helped students to download the PPTs to their devices rather than asking in their flash drives from each faculty member.
- Placing QR codes on printed posters and that link toonline video tutorials and training videos.
- A recommendation list containing the books and other resources with call numbers available in

the departmental library or in the central library of the university were prepared. This list was uploaded on Dropbox and the public link was encoded in QR code format. This practice helped the students in choosing appropriate resources from the library.

- The research students of the department have access to the Xerox machine of the institute, a QR code mounted on this machine linking to the online tutorial of the Xerox machine. Similarly, this is done for printers and other equipment available in the department.
- The contact details with the profile pages of, faculty members, supporting staff, and other important numbers of the university officials were encoded in QR code and pasted on the doors of the respective faculty member and notice boards. This helped students in saving the contacts without the requirement of typing the contact details. Also the new students were able to know about the details of the faculty member and could directly contact the faculty members. This practice eventually reduced the gap between faculty members and students.
- QR codes were generated for the “feedback page” of the university website to collect feedback from the students about the DRILIS or the university.
- Another area where QR codes were implemented was to put QR codes on general departmental notices. Such as, availability of online examination forms, university functions and activities, etc.
- The institute is under the process of getting Wi-Fi connectivity, the institute has planned to generate the QR code containing the details of the network for students to scan. This will help the students in simplification of connection process, as the requirement of user to input lengthy network name and passwords would not be needed.

Issues

Although QR codes are easy to implement, involve less cost, and easy to use, there are several issues that prevent the wide adoption of this emerging technology in classrooms.

Still, the number of students having smartphones is very low. Most of the students in DRILIS are first time college goers with low income group families it is hard for them to buy a smartphone.

Another issue is of data plan prices as offered by the telecom service providers. Paying for data plan price is felt as an extra burden for many students, so apart from having a smartphone many of them do not use them to access Internet. Text-based QR codes and automated calling and texting codes will still work for these users, but anything requiring access to the Internet will not work (Hoy, 2011). But, with the dropping data plan prices in last few months the situation seems to be changing. Also, after the proposed Wi-Fi connectivity is available in the institute this issue would be automatically resolved.

Another issue observed in the project was that, some smartphones were not capable of running QR code software. Currently, most smartphones do not come with code-scanning software preinstalled, so users must download and install an application and learn to use it before they can begin scanning QR codes. As new smartphones are released with pre-installed QR code software, this issue would also be resolved.

The low awareness about QR codes among the students was another challenge. To overcome this challenge, the students were made aware about the benefits of QR codes and their use during the class lectures. Also the materials being provided by the QR code are made to be compelling enough to raise the curiosity among the students.

Similarly, another issue was the non-availability of mobile friendly sites of referred resources. As the mobile phone has limitations such as, smaller screens, with uncomfortable input mechanisms, and difficult to navigate. Linking the students to a website designed for just access on a desktop would lead to displeasure when accessed through a mobile phone. This issue was resolved in two ways, first, by encoding URLs of mobile friendly page of the referred website if available. Second, by avoiding one

page for all information but separate QR codes for separate information so that less information is available at every scan with least required navigation.

Conclusion

The project proves that academic departments are benefitted with the application of QR codes in teaching and research. For maximum effectiveness of QR codes, awareness about the usefulness and benefits of QR codes to the enrolled students needs to be done. Also, as far as possible links to mobile friendly websites should be encoded.

Further studies need to be done to know how useful the specific linked resources were to the students, or even if they were used for research purposes or simply scanned out of curiosity (Kane & Schneidewind, 2011). These user experience studies would be helpful to refine practices and maximize utility.

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