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Author autobiographical note

Andrew Walsh is a Senior Assistant Librarian at the University of Huddersfield. He is currently chair of an information skills group within the university library, seeking to improve the teaching and assessment of information literacy within the institution. Andrew is particularly interested in information literacy, the use of active learning within library sessions, the encouragement of evidence based librarianship, and the appropriate use of Web 2.0 technologies to make his life easier. Andrew is also studying part-time for an information literacy related PhD at the University of Huddersfield.

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Abstract

QR codes and Libraries

Purpose

This article explains the nature of QR (Quick response) codes and their possible applications in libraries.

Design/methodology/approach

Existing uses; applications and functionality of QR codes are looked, before turning to the limited existing use of QR codes in libraries. The Author then suggests many different ways QR codes could be used in our libraries.

Findings

Most of our users are likely to be able to use QR codes if they install a free reader onto their camera 'phones or other mobile device. An already high and further increasing number of people own suitable devices. There are many ways QR codes can be used, with the most exciting applications relying on the use of the internet from mobile devices. The main restrictions on their take up is likely to be increasing awareness of QR codes and carefully marketing services based on QR codes to our users.

Originality/value

Outside Japan few libraries have implemented services based on QR codes. This article is the first of it's kind aimed at libraries and it shows how we can use them to take advantage of the mobile devices in many of our users' pockets.

Keywords:

QR codes, mobile learning, communication technologies

Article

QR codes and Libraries

What are QR codes?

QR (or Quick Response) codes are a type of two dimensional barcode. Normal barcodes only hold information in one dimension (horizontally) and are seriously limited in the amount of data they can contain. Denso Wave developed QR codes as a way of holding information in two dimensions (they go horizontally and vertically) and are strictly described as a matrix code than a barcode. Denso Wave saw them as a way of improving inventory control and tracking in manufacturing units, but instead of licensing the concept out to others, released it freely in 1994 (Denso Wave, 2003). As suits something developed for a demanding, fast moving environment, they included generous error correction capabilities and QR codes can be set up to still work even if 30% of the symbol is damaged or obscured.

The QR codes follow an international standard (ISO/IEC18004), although this does not cover all the data types used for mobile 'phones. This has allowed a proliferation of QR code generators and readers to be produced which should be largely compatible with each other, but with a risk that they may vary slightly in operation on mobile 'phones.

These codes are very popular in Japan, and most mobile phones sold there have QR reader software already installed. They are less well known for most of the world. If you want to use QR codes on your mobile device, you'll need to install the software yourself. In Europe, Nokia have their own barcode reader (which includes QR codes) which was developed in house by Nokia Labs and came pre-installed on many of its most popular phones in 2008. In Australia, Telstra, the biggest Australian mobile phone carrier, have been trialling it's use with some of their 'phones from 2007. Other mobile devices that come with cameras installed, such as most netbooks, are equally able to install QR readers.

There are plenty of QR code readers available for free on the internet, including those listed at the end of this article. Normally the best option is to put your mobile phone model together with "QR reader" into a web search engine. For popular models you are likely to find a compatible reader on the first page of results. QR codes can be used to encode various sorts of data when used for mobiles, most typically text; URLs; phone numbers (prompting your phone to call the number); text message & number (prompting your phone to text the number); and contact details (vcard). The QR readers most reliably work with the text and URL options, particularly as some of the providers of the software also provide hosting services. In hosted solutions, QR codes generated through their software link to a re-direction link on their site, providing data on traffic from a particular code to their customers.

Applications

Several applications for QR Codes are in place in Japan, from providing voucher codes for money in supermarkets to linking to further information on all sorts of products via the web. QR Codes

are particularly prevalent on advertising material. Elsewhere in the world they are slowly becoming more common. Some great examples of QR codes can be found on the photo sharing site, Flickr at <http://www.flickr.com/groups/qrcodes>, *on sign posts in tourist hotspots (to an encyclopaedia entry on the location); on posters (linking to further promotional material); and around universities (including a competition to win chocolate).*

So, what can they be used for in libraries?

Text:

The QR codes can encode text, which is great for people who may not have a mobile 'phone subscription that includes data, so is more accessible than codes that link to URLs. Libraries could use codes containing text to give location specific help and tips to people without text-heavy posters and displays. They could be a way of extending signs around the library; for example, there could be a QR code next to various subjects containing location specific instructions (e.g. The code to the right contains the text: "Go up one floor; though the door; turn left and walk 20 feet, the books will be on your left"). This gives a level of detail that would be impossible to provide in normal text on any sign.

QR Codes could provide tips and extended information on any sign or piece of library equipment. They can provide useful summaries of information from library web pages to save users having to write down notes from the screen. For instance, the University of Bath automatically generates codes on its library OPAC (<http://www.bath.ac.uk/library/catalogue>) that gives brief details of the entries for each item.

SMS:

A QR code containing a phone number and the start of a text (SMS) message can be used to link to a "text a librarian" service. There are increasing numbers of functions that can be carried out by SMS, but depending on the systems involved, they could be used to send texts to automatically renew books; get lists of books checked out; push feedback to a central location or display it on a text wall within the library. The codes can also be used to send texts to a number used for discussion or feedback in a teaching situation. The code to the right contains a link to the Text a Librarian service at the University of Huddersfield, including the keyword "LIBRARY" that is required for the web based portal to direct queries to the correct account.

Phone number:

Contact phone numbers can be displayed in appropriate locations via QR codes. The phone number for student IT help could be by the printers; or subject librarian numbers could be in specific subject areas of the library. Students could then call these numbers when and where they need to or store them in their phone's contact lists for a later time. The example to the right is for the "ask a librarian" service at the University of Huddersfield library.

URLs:

Possibly the most useful way of using QR codes is for encoding URLs. It does however automatically exclude anyone without WIFI access on their mobile device from using them. This method of using QR Codes links to information on the Internet, so as long as the URL contains information viewable on a mobile phone, the applications are limited only by our imagination.

A few examples:

- Location specific videos or podcasts (so, for instance, users could listen or watch material on finding law reports in the law section, or using the photocopier through a code displayed on the copier lid).
- Links to real-time holdings of journals through QR codes stuck onto journal boxes, or the front of journals themselves.
- Access to supplementary information from QR codes printed in handouts in the form of web pages or videos.
- Links to quizzes (sites such as <http://www.mobilestudy.org> allows one to create mobile friendly quizzes) as a way of getting learners to check their knowledge on handouts given out after information literacy sessions.
- Short cuts to live, mobile friendly, web pages from existing webpages (see example below, a link to a book from a code generated automatically on the University of Huddersfield library OPAC, <http://webcat.hud.ac.uk>).

These URLs have added advantages over other uses of QR codes as they can include tracking information (possibly by automatically redirecting from an intermediate site) so the library will know how many people are using the QR codes that are displaying and whether they are useful to library users. They also let us change and update the content (by changing the website they link to), without changing the QR code. This can be important if they are printed or used in long-term signage.

Practical concerns

The first is simply the ability to view them. Luckily, this isn't too serious a problem, with a recent survey at the University of Bath (Ramsden &, Jordan, 2009) finding that 93% of their students owned a mobile phone (the basic requirement for viewing QR codes) and that for the majority of the top 10 phones identified, there was a QR code reader available. This figure is quite likely to increase in the future as the market penetration of camera phones continues to increase.

Although large numbers of individuals own the necessary hardware, a much lower proportion have the software installed. Currently, it comes installed in only a small number of phones outside of Japan. Cellphone owners have to become aware of QR codes and how to obtain QR code readers if they are to make use of them. QR readers are available free over the Internet.

Very few people outside of Japan are aware of QR codes, so for libraries to make effective use of them requires marketing and promotion efforts as to what they are; why they can be useful for them. The survey at the University of Bath found that only 12.6% of respondents knew what a QR code was. This is in an environment where we might expect the average person to be more aware

and an earlier adopter of such technologies. QR Code services themselves must also be carefully selected to meet the needs of users, so it is worth their time and effort to use this new and unfamiliar tool.

The third and final important practical issue is that of data charges. Few users have data bundled as part of their mobile phone packages. Increasingly, smart phones come with WIFI access that can take advantage of any wireless internet connection provided through the library. If all QR codes link to URLs, there are some incredibly useful things that are possible, but in the current mobile environment, the bulk of potential users are excluded. It makes sense to make certain number of the QR codes used do not require mobile internet access, perhaps flagging these up by printing them in a different color so as not to alienate potential users. The use of smart phones will certainly grow which will allow libraries to make greater use for URLs.

QR Code Readers / Generators

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>

Further Reading, References and Useful Links

Denso Wave (2003) *QR code.com available at:* <http://www.denso-wave.com/qrcode/index-e.html>
Accessed 26/05/09.

Ramsden, A., Jordan, L. (2009) Are students ready for QR codes? Findings from a student survey at the University of Bath. Working Paper. University of Bath. Available at: <http://opus.bath.ac.uk/12782/> Accessed 26/05/09.

Mobile Study (mobile friendly quizzes) www.mobilestudy.org

QR Codes at Bath blog - <http://blogs.bath.ac.uk/qrcode/>

QR Codes in the wild - www.flickr.com/groups/qrcodes

University of Bath Library catalogue - www.bath.ac.uk/library/catalogue

University of Huddersfield Library catalogue - <http://webcat.hud.ac.uk>

Youtube video demonstrating QR codes - http://www.youtube.com/watch?v=uf_DNHPBV-s