LBSC 622 – DR. MEGA SUBRAMANIAM

QR Codes in Libraries

Expanding Access for Diverse Populations

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QR codes are currently trending in academic, public, and school libraries in the US. Leveraging QR codes for self-paced reference services, wayfinding, and collection enhancement both bridges and connects virtual and physical access in a ways that heuristically match the changing 21st-Century information environment. Although little research exists to definitively point to QR codes as effective means in library settings, creative applications of QR codes are changing the way that libraries think about information findability and portability, crosswalks between content, and user-directed library services. Nevertheless, current and proposed QR code implementations show promising potential for offering diverse populations of patrons and learners choices in information access.

Overview

QR, or Quick Response, codes are two-dimensional barcodes that hold more information than traditional UPC barcodes. Developed in 1994 by Toyota subsidiary Denso-Wave to scan automobile parts, QR codes began to be implemented by businesses for marketing purposes and are becoming ubiquitous in the UK, Asia, and North America(Al-Khalifa, 2008; Ashford, 2010; Baker, 2010; Fletcher, 2010; Hicks & Sinkinson, 2011; Porter, 2011; Walsh, 2009). QR codes can store up to 4,296 alphanumeric characters (Fletcher, 2010) and allow digital information to be decoded at high speeds. QR codes can hold links to websites, contact information such as email, maps, audio, video, and free text. The information embedded in QR codes is accessed by smart phones and other Internet-enabled mobile devices using free or low-cost QR scanning apps. The device's onboard camera snaps a picture of the black-and-white geometric image, and the app decodes the information and points the device's browser towards the information source. Through QR codes, users can now quickly access websites, coupons, contact information, chat, video, audio, and documents through their smart phone. In this way QR codes engage users by bridging physical and virtual worlds, providing simple augmented reality that heuristically match the 21st-Century information environment, and exploiting the portability of mobile technologies to potentially reach users anywhere (Baker, 2010; Hicks & Sinkinson, 2011; Walsh, 2010). QR codes are simple to create using free code generator apps, easy to implement by adding them as images to documents and producing them with standard printers, and easy to use for patrons with Internet-enabled mobile devices (Ashford, 2011).

QR codes are trending in libraries: they made ACRL's 2010 top ten trends in academic libraries (Ashford, 2010), were recognized as one of four ALA top cutting-edge public library services (Roberts, 2012), and two popular QR code generators made AASL's 2011 top 25 best

websites for teaching and learning (Habley, 2011). There is little formal research on the effectiveness of using QR codes in libraries, but two studies in academic libraries have shown success. In the Abilene Christian University (ACU) Library Study, displays created with books and library resources paired with QR codes revealed that 95% of the selected books circulated and page views of selected websites and journals increase by 33-48% (Baker, 2010). At Huddersfield University, an initial survey found that 8% of users recognized QR codes, yet after 1 semester of their integration into the library that number rose to 22% (Walsh, 2009).

QR codes can provide just-in-time services for wayfinding, navigation, and reference (Ashford, 2010; Baker, 2010; Fletcher, 2010; Hicks & Sinkinson, 2011; Massis, 2011; Porter, 2011; Roberts, 2012; Walsh; 2010). By embedding QR codes into OPAC catalogs, users can snap bibliographic information and walk directly to the stacks. QR codes placed at stack endcaps can offer information about what is contained in the section, link to subject guides, or provide booklists. QR codes with links to maps can help users orient themselves physically in the library, lead them to services like printers or check-out, deliver an audio tour, or access the library's mobile site. Links to FAQs, contact information, hours of operation, transportation schedules, YouTube playlists of library tutorial videos, online instruction manuals, or the reference librarians via chat or SMS allows users direct access to virtual embedded library services. Linking QR codes to forms can allow users to take documents with them on their mobile devices or point patrons directly to sign-up for meeting rooms, programs and volunteering.

QR codes can enhance intellectual access to and user engagement with the collection (Ashford, 2010; Baker, 2010; Roberts, 2012; Walsh, 2010). QR codes on physical items such as book, bookmarks, posters, DVD and CD cases, and audiobooks can link to movie and book trailers, author interviews, read-alike lists, or works by the same author or composer. Likewise

an exhibit within the library could make use of QR codes to link to corresponding materials in the library's collection or free downloadables like videos and music online. QR codes can link a book to its audiobook or e-book versions, and physically promote digital content such as databases and journals, e-collections, streaming video and music, online subject guides, periodicals, and other digitally curated content (DCC). QR codes can of course promote the library itself by linking to social media profiles, offering platforms for partnership with local organizations, and reaching the community beyond the library building by inviting users into the library's virtual space when library QR codes are positioned throughout a neighborhood (Ashford 2010; Baker, 2010; Hicks & Sinkinson, 2011).

QR Codes as Assistive Technologies

The portability and increasingly intuitive interfaces of mobile devices such as smart phones with touchscreens provide access to users with motor and dexterity challenges (Harpold, 2012). The ability to access maps, contact information, directions, schedules, websites and bibliographic information can provide alternative that would otherwise require note-taking with a pencil and paper are inclusively helpful to both patrons and library budgets, but are particularly useful to users with a variety of challenges including literacy and other print disabilities, orthopedic, cognitive, and vision disabilities ("QR Codes: Uses and Accessibility for Persons with Disabilities," 2011). The ability to have direct access to information related to services and collections or to engaging content in formats other than print provides options to patrons to acquire and carry content with potential benefit to those on the Autism spectrum, with learning disabilities (LD), ADD/ADHD, or memory disorders. QR codes could also provide links to images that correspond with text for universal labeling that could benefit users with print or cognitive disabilities, and low or no English proficiency as well as appeal to young children. For

non-native speakers, QR codes could link to foreign language collections of English language learning systems. A proposed system equipping smart phones with QR code readers and Nuance TALKS could allow blind and low-vision users to use QR codes to have content read aloud which could easily be used in libraries: the system would emit an audio signal alerting the user that a QR code is present, assist with alignment, and prompt to snap a picture (Al-Khalifa, 2008). QR codes could speed up access to closed-captioned content, reference chat, or could even stream live video of a remote ASL interpreter for deaf users.

In school libraries, QR codes facilitate differentiated instruction and can scaffold Universal Design for Learning (UDL). QR codes are self-pacing and student-centered when activated by the user, and the ability to instantaneously access summarized class materials, simplified text, pictoral representations, and audio or video instructions hold great potential for students with a variety of cognitive and print disabilities including LD, Autism/PDD, Asperger's Syndrome, vision or hearing disabilities, dyslexia and low print literacy. QR codes can link physical flashcards to digital content that create inclusive access for learners with print or cognitive disabilities, and can make flash cards and other study tools "talk" with linked audio for students with vision disabilities (Harpold, 2012). Placing QR codes on physical objects in the collection using methods employed at public libraries can enhance access to the collection for learners with and without disabilities. For ELL/ESOL learners, QR codes generate opportunities for improved communication and self-actualization of learning and participation by providing common-ground visuals and audio cues in native languages either through direct instruction or simple augmented reality (Coetail, 2011; Jones, 2011). While students, like other disadvantaged populations, are less likely to own smart phones with data plans, all libraries can move to include devices for lend with wireless access to navigate collections and services via QR codes.

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Appendix: QR Code Resources

QR Code Applications

- Azon Media ($199/month mass tracking services)
- BeeTagger (can forward/share content via email or SMS, save content to “favorites”)
- Delivr
- Google QR Code extension
- icandy (generate, scan, and track)
- i-nigma (AASL winner, works with more than 400 devices)
- Kaywa
- Linkee
- Microsoft Tag (AASL winner, free text up to 1000 characters, does color QR codes)
- Mobile Tag
- Neoreader
- Nokia Barcode Reader
- QR Droid
- QR Reader (free; premium version with no ads for $0.99)
- QR Voice (allows text-to-voice up to 100 characters)
- Qrafter
- QuickMark
- ScanLife
- SnapMaze
- Upcode
- Zxing

QR Codes Exploration

- How to Create a QR Code in 3 Easy Steps (Jones, 2011 Oct. 13)
- QR Code Quest: a Library Scavenger Hunt (Jones, 2011 Mar. 29)
- Contra Costa County Library: "Snap & Go"(ALA winner)
- QR Codes at Bath (igniting quantitative study of QR codes in academic libraries)

- Books2Barcodes (12 encoded classics for mobile reading)

Readings for Further Discussion

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Presentation Links

http://bit.ly/y0fyHG