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Memo Cordova
Boise State University

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The Quick Response (QR) Code: Graphic Potential for Libraries

by Memo Cordova

The convergences of Web-ready mobile tools and applications have changed how we interact with our physical and virtual environments. Web-ready mobile devices (particularly smartphones, but tablets and Wi-Fi ready MP3 players are also on the increase) have supplanted the traditional desktop computer. According to *IDC Worldwide Quarterly Mobile Phone Tracker*, a February 7, 2011, press release noted that "Smartphone manufacturers shipped 100.9 million devices in the fourth quarter of 2010...PC manufacturers shipped 92.1 million units" (IDC). For the first time ever, smartphones have outsold traditional desktop computers. This is telling on several levels, the most salient being that our mode of interaction with information in any form (play, work, school, homework, etc.) has shifted from a static environment (wired computer) to a highly mobile one. We are moving (literally!) to on-the-go computing and manage a great deal of our everyday affairs via mobile handheld devices.

Part of this growing dependence on mobile computing is based on the huge market of applications (or "apps") available for these devices; not only do these apps make computing easier, they also provide a richer audiovisual online experience. An app is simply a bit of stand-alone software that performs a specific function or calculation. The adage, "There's an app for that," is not a gag—as more devices come equipped with speedier processors, stunning visual displays, and photo and video capabilities, apps are developing alongside them to enhance their functionality. Meanwhile, there is also a burgeoning wave of technology and software that expands our experience of the physical world by adding online resources through what is called Augmented Reality, or AR. "The basic idea of augmented reality is to superimpose graphics, audio and other sensory enhancements over a real-world environment in real time" (Bonsor). Applications like Google Goggles (**http://www.google.com/mobile/goggles/**) and mobile browsers like Layar (**http://www.layar.com**/) have expanded the functionality of a device's camera to visually interact with our physical environment. Google's app "uses image recognition technology to recognize objects and return relevant search results. Identifies products, famous landmarks, storefronts, artwork, and popular images found online" (Android Market).

QR codes (short for "Quick Response" codes) are a facet of this new breed of AR technology. A QR code is a graphical interface (think of it as a linked image) that augments print and Web material via encoded information. You need a scanner app like Google Goggles (or any one of dozens of similar scanner apps) to decode the QR code using your device's camera. A QR code, as opposed to its cousin the barcode, is pixellated in such a way because it can encode "information in both the vertical and horizontal directions, whereas a bar code contains data in one direction only. A QR Code holds a considerably greater volume of information than a bar code" ("About 2D Code," 2010).

Multiple bar code layout   2D Code with stacked bar codes (stacked bar code type)   2D Code (matrix type)

Figure 1. 2D Progression from the stacked bar code method to the more information rich matrix method, aka QR Code.

The QR code was developed by the Japanese company Denso Wave in the early 1990s, and was primarily used in the manufacturing sector to scan items in production lines. Soon after QR codes started showing up in Japanese retail and entertainment venues, and were adopted by a tech-savvy Japanese society.

QR codes did not make a big impact in the United States until recently, thanks in part to the development of smartphones and other Web-ready devices and their accompanying corpus of applications. The private and commercial sectors have started using QR codes to promote, enhance, and engage this growing mobile demographic. Companies like Best Buy, Target, Nike and other retail businesses put QR codes in their advertisements to entice consumers to visit mobile-friendly product pages. For these types of businesses, QR codes are a low-cost, high-yield tool that can enhance a marketing campaign, and target tech-savvy consumer to visit mobile-friendly pages to showcase products or services. Because a QR code is a simple black and white image, one can print, paste, or embed a QR code just about anywhere. It's a simple way to bridge the transmission of data from one point of access directly to the user's mobile device via a scanner app and a camera.

Figure 2. Best Buy makes weekly circular more interactive with mobile marketing.

Create Your Own QR Code

The process for making QR codes is fairly straightforward, and a good list of generators can be found at this web site: **http://2d-code.co.uk/qr-code-generators/**. So what makes QR codes generators different? It depends what you want out of the code and what you want the end-user to experience. Some generators have basic differences: some are paid and some are free; some generators do not provide analytics (which measure visits to your website) or provide limited tracking data; some generators redirect scanned codes to a landing page not of your design (which is bad form from an end-user experience); some generators are the fly-by-night operation type, or their reliability is suspect; and some offer limited encoding abilities, meaning that only some types of codes can be generated.

For QR codes to be an effective tool to optimize the online experience of your mobile user, here are some tips to take into consideration:

1. QR codes are read by camera-ready devices in conjunction with a scanner or reader app. Provide a link somewhere near the code where users can download a QR code reader/scanner.
2. QR codes should link to specific websites, contact information, or a section of a larger body of information. It should be a direct static-to-mobile transaction, taking the user directly to the link encoded in the QR code without re-directs.
3. Codes should be accompanied by contextual information—let the person scanning the code know where the

code will take them: a website, SMS, contact info, URL, YouTube link, etc.

4. The code must be easy to scan: the bigger the code, the easier it is for the scanner to decipher the code. The smallest code should measure at least 1"x1", but 2" x 2" is better.

5. Leave at least a 1/8" of white space around the code. This makes it easier for the scanner application to visually cue in to the code.

6. For encoding links, a website like **Bit.ly** or **TinyURL** should be used to shorten the URL. The shorter the link, the less crowded the code will look.

7. QR codes can be colorful and have embedded images, but simple black and white codes are easier for devices to scan and are less error-prone.

8. QR codes enable content to be accessed via a mobile device, so make the end destination a mobile-friendly page.

To learn more, visit my library guide about QR codes, where I suggest scanner applications for varying operating systems (OS) and best practices: "*What is a QR Code?*" **http://guides.boisestate.edu/qrcodes**.

QR Code Use at Albertsons Library

At Albertsons Library I use a couple of QR code generators, depending on what I want to encode, but my favorites so far are **Bit.ly** and a QR code generator website developed by an IT professional named Kerem Erkam, located at **http://keremerkan.net/qr-code-and-2d-code-generator/**.

Bit.ly

Known for their simple, full-featured link shortener, **Bit.ly** offers a robust package that can track links you shorten using their service, and it can also generate a QR code based on shortened links. Bit.ly is my preferred QR code creator for several reasons. First, it's free. Second, it provides a fairly robust dashboard for tracking links or finding out the number of times a QR code has been scanned. Third, I can customize shortened links to have names or titles instead of a random number-letter combination.

If you give Bit.ly a try, I recommend creating an account, especially if you are going to create more than one QR code. Once you're logged in, simply shorten a link and Bit.ly will automatically generate a QR code for you. You can then save the QR code image that Bit.ly generates and embed, save, or print the QR code and post it as needed. Bit.ly will keep track of the number of times a link has been clicked and a QR code has been scanned.

This screenshot below shows how Bit.ly's dashboard details tracking data and provides a QR code specifically for a link I created for the library's mobile website.

Figure 3. Bit.ly Dashboard.

Kerem Erkam's Website

I use Bit.ly mainly to link to our library's mobile site or other mobile-friendly links, so my use is focused on web-based, outbound URLs. However, when I need to create QR codes to encode other types of information, I use **Mr. Erkam's website**. His "QR Code and 2D Code Generator" site provides an extensive array of codes (including Data Matrix, Aztec, and Micro codes) and encoding options, like maps, web links, calendar events, free text, SMS, and more. You can also change the color scheme of the code and shorten a link using some of the more popular link shorteners. Once you finish your selection and coding options a sizeable QR code is generated for you; from there you can right-click on the code and save it to your computer.

Figure 4. Kerem Erkan's QR Code and 2D Code Generator**.**

QR Code Use in Libraries

A QR code is an image file that has information contained within. Because of its simple design and size, it can be printed on paper or displayed on a website. As long as the lines and squares of the code are sharp and well contrasted, they can be read by a scanner and its information disseminated effectively. QR codes can be placed pretty much anywhere and on anything, so deploying QR codes in your library is a question of preference. Libraries may wish to paste or display QR codes in any of these ways within their buildings:

1. At the entrance of a library, linked to the library's mobile website or a specific page on the mobile site (Hours, Circulation, reference phone number, etc.).
2. Near the stairs or elevator, linked to a map or specific section of the library (floor plan, etc.).
3. Near a new books display, linked to a collection of new books or takes the user to an RSS feed of newly purchased library materials.
4. Near the reference desk, linked to an email, text, or chat reference service.
5. On a librarian's door or window, linked to personal profile or subject guide.
6. At the Circulation desk, linked to checkout procedures, fine information, etc.
7. Near specific collection areas (children's, teens, career, reference, monthly book display, genealogy collection, etc.), linked to more information about the collection.
8. Outside study or meeting rooms, linked to room policies.

9. On library handouts, bookmarks, new database flyers, and promotional brochures and posters, linked to the library main mobile site.

Code Placement in Online Environments

1. On the main library website and subpages, linked to the library's mobile website or to a library's social media presence (Twitter, Facebook, Flickr, etc.).
2. Projected on digital frames and TV monitors in the library, linked to the library mobile site or relevant page.
3. In library subject guides, librarian profiles, or staff web pages, linked to contact information for the individual.
4. On subject-specific database pages, linked to librarian profiles or subject guides.

One of the best lists I found on the use of QR codes to market your print and online presence is from the *That's Great* blog, titled "**101 Uses For Quick Response (QR) Codes: Creating Audience Engagement With The Next Killer US App**." One can easily transfer the same conceptual promotional ideas to enhance the user experience with the many resources available at your library. Another is Robin Ashford's article in *College & Research Libraries News* titled, "**QR codes and academic libraries**."

QR codes are a simple tool to disseminate content to the hands of a growing mobile user demographic. A simple QR code strategy for your library is a low-cost and innovative way to interact with your users and provide them with easy access to library resources on their mobile device of choice.

Figure 5. QR code linking to my profile on various social media sites.

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