QR Codes and the Library: The Library Audio Tour

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Introduction

How do new college students learn about the library? What information do librarians provide to help connect them with the library, its resources and its importance to their academic success? How can we encourage student engagement with the library and all the information available to them, both print and online? All of these are questions to which college and university libraries struggle to find answers. Finding answers to these questions will increase usage of library space and resources, as well and improve the research abilities of the students. One method is through an introduction to or tour of the library.

Many college or university libraries require first year students to complete a tour or orientation of the library, as an introduction to the services provided therein. At Brigham Young University (BYU), the library audio tour at the Harold B. Lee Library (HBLL) has served this purpose for decades without much change in the way library information is presented. The script has changed (largely because of shifts and service relocations), as well as the delivery medium (from cassette tape to CD to MP3), but the mode of content delivery has continued to be a one-way interaction—information presented to the student via audio. This mode of delivery is not in itself ineffective for every student. However, many students learn better if they are able to interact with the information they are required to learn. Since individuals have various learning styles, library information, such as the tour, should be presented in a variety of ways to facilitate learning in these different styles.[1]

For those students who are more visual or kinesthetic learners, is there a way to encourage students to interact with library resources while taking a tour? One potential method is to use QR (quick response) codes. QR codes (http://en.wikipedia.org/wiki/QR_Code) were invented in Japan by Denso-Wave, who owns the patent for the code but has not exercised their rights, for inventory management and are more popular in the world of inventory management, where scanners are heavily used for that purpose. These codes are two-dimensional codes similar to bar codes, which transmit information to a cell phone by taking a picture of the matrix. This matrix is then interpreted by software on the phone that saves the textual information to the phone. Since between 80 and 90 percent of college and university students own a cell phone,[2] many of which have built-in cameras, using the hardware already owned by students provides a great opportunity to integrate learning with technology.

The following is a report of a study conducted using QR codes as the delivery mode of the library audio tour at the HBLL at BYU.

Literature Review

Many of the publications reporting the use of QR codes in libraries come from three institutions: the University of Huddersfield and the University of Bath, both in the UK, and The Rector Gabriel Ferraté Li-

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brary at the Technical University of Catalonia. Other articles can be found showing the use of QR codes used in industries other than libraries.

The University of Huddersfield is using QR codes for "links to electronic resources, instructional videos, useful websites for further information, directly containing contact details, and as a way of storing information for future reference,"[3] as well as for "finding appropriate help", "providing an electronic alternative to physical books" and other purposes.[4] In each of these cases, the QR code represents textual information that either points to resources (URLs) or stores information in the phone for later use (call numbers).

The University of Bath has been awarded a grant, managed by Andy Ramsden, to investigate uses of QR codes throughout the university. Reports of many of these are available on the University of Bath *Opus* Online Publication Store (http://opus.bath.ac.uk/). QR codes are being used at Bath "to join up library services with the technology and equipment students use."[5] The studies are developed to discover if QR codes is a technology that students will use. These uses include a project similar to the one presented here. Scanning a QR code "with a compatible mobile phone, [one] can download an MP3 audio tour of the third floor" of the library to a phone. In addition, QR codes are being used to transfer "the class number, author and title" of items from their catalog. The QR codes for the catalog are created dynamically using a program written by the systems librarian.[6]

In the Rector Gabriel Ferraté Library at the Technical University of Catalonia QR codes are being used on "posters to promote new web services" and to point to "registration forms to use the computer facilities in the library." These uses help to "avoid manual introduction of data in the user's cell phone", thus facilitating the information transfer which students perform on their cell phones. The idea is to make it easier and more accurate for the user so "s/he doesn't have to remember data or collect pieces of paper."[7]

Kentucky State University
While researching other libraries that use QR codes I realized that there really are not a lot of libraries using QR codes for user services or current uses have not been reported. As smart phones become more popular, and as students learn to use them, QR codes will become more familiar to the users. As QR codes are used in more mainstream services,

such as airlines and popular advertising (see http://www.flickr.com/photos/digitcom-digital-marketing/sets/72157623708574110/ for examples), students will create uses for QR codes. The key is to find how students will use the codes.

Method
After obtaining approval from the BYU Institutional Review Board (IRB) we performed two trials of the QR code audio tour. The first (alpha test) was intended to discover immediate problems with the process and the technology. After correcting some of the issues discovered in the first trial, the second trial (beta test) furthered the discovery process.

For the alpha testing, done toward the end of summer term (August 2010), we invited library student employees who own smart phones to participate in a focus group. The smart phone was required because the lower two floors of the library, where many audio tour stops are located, do not have a cell phone signal, but *are* covered by WiFi. Thus, we relied on phones that not only have a camera, but also have WiFi access to the Internet. This did limit the number of students able to participate. This phase started with a short introduction to the process to ensure that appropriate software was installed on the phone, and if not help get one installed. After the brief introduction, the students completed the tour using the QR codes. When finished, they returned to the meeting room and we discussed the technical details of the tour. We tried to keep the focus of the trial on the technology and use of QR codes, rather than on the audio content of the tour.

Phase two, or the beta test, took place throughout fall semester (September–December 2010). All available modes of taking the library tour (MP3 player, QR codes, and the virtual tour) were presented to First Year Writing (FYW) students through their Blackboard courses (all students enrolled in FYW are assigned to a Library course in Blackboard.) In addition, students in five sections were asked specifically to take the tour using the QR codes, if they owned a device capable of using QR codes. In two of those sections the instructor offered extra credit to the students for a one page write-up on the experience of taking the tour, whichever way was chosen. Not only did this give some good feedback regarding the QR code mode of taking the tour, but other feedback was received about the other tour modes. This other feedback was given

to the library instruction section for their information. During this phase statistics were also kept about QR code use. This was done by creating an individual html page, with code for Omniture (a web analytics software—http://www.omniture.com/), which redirected to the audio file. A Qualtrics survey was also developed to capture additional feedback. Feedback received will be presented in the Discussion section.

FIGURE 1
Tour Stop QR Code Example

Library Audio Tour Stop

What's this?
http://lib.byu.edu/sites/qrcodes/

Discussion
Alpha Test
The tour for the alpha test consisted of 16 stops (16 codes), matching the 16 tracks from the original tour audio. Each code was placed in an area where the audio track began. The student was asked to follow the tracks in much the same order as the MP3 audio tour. The purpose of doing it this way was to tease out any bugs in the technology before the beta test.

The alpha test focus group met for a brief introduction to QR codes and to ensure that a QR code reader was installed on their phone. Only five student employees participated in the focus group (less than hoped for but about what was expected). This is largely due to the low number of library student employees with smart phones. After the brief introduction the students were asked to complete the tour and return to the meeting room, where lunch was waiting. The participants discussed their experience to get their feelings about taking the library tour using QR codes.

The participants in the focus group responded well to the tour. Generally the comments were positive with some great suggestions. Most preferred the QR code way of taking the tour, over the MP3 mode, for the following reasons:

- "You don't look like a freshman." (This refers to the fact that all freshman walk around the library with the headphones and map, making them feel conspicuous.)
- You can take the tour at your own leisure, instead of having to return the MP3 player to the Media Center when finished with the tour.
- "I can use the tour stops later." (This refers to the ability to store a history of visited codes in the phone.)
- "I like not having to listen to the directional information." (The previous audio tour had information stating where to go next. Using QR codes makes that unnecessary.)
- This should become more popular as more people get smart phones.

There were some comments/suggestions that needed to be addressed:

- "WiFi dropped in the atrium." (If there are any connectivity issues during the tour, students will not want to wait for them to be resolved.)
- "[When I took the tour] as a freshman, nothing was useful."
- Too much information on the tour.
  - Could the number of stops be reduced to cater to specific campus colleges/departments?
  - Only put the most important information on the tour.
  - More points with less information at each point.
- Have the QR codes link to an information page instead of directly to the audio file
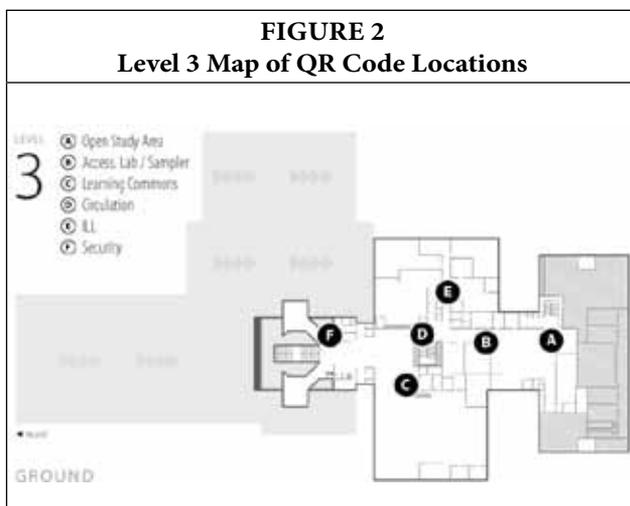
Beta Test
Because of comments received during the alpha test we made some changes to the way the tour was done for the beta test. Instead of using the original audio, as received from Library Instruction, the audio was edited to only have information about individual areas. Directional information (e.g. "Turn right", "Look left", etc.) was the only thing removed from the au-

dio. Directional information was replaced by using a map with the library QR code locations indicated. Editing the audio in this way increased the number of tour stops to 21, but the information provided in each track was not only shorter, but also more specific to the location where the code was placed.

Feedback from the two sections asked to complete the tour for extra credit was mixed. One individual took the tour twice; once with the QR codes and once with the MP3 player checked out from the Media Center. This student stated: "My honest opinion is that it [the QR code tour] is the worst option for taking the tour, especially if you are taking the tour as a group." On the other hand, another student stated, "The QR codes worked seamlessly with the iPod touch our group used to take the tour." But this student also stated that taking the tour alone would be better. The difference can be explained best by what another student stated, "Personally, I am a visual person and this version of the library [tour] fit me well." This speaks to the fact that there are different learning styles. This same student stated, "The fact that there are several different ways you can complete the library tour is also impressive."

One of the complaints, from those who disliked the QR code tour and those who liked it, was that "the maps we used we're [sic] okay, but occasionally they didn't help us find the next QR code very easily." This shows that the map needs work to make it more useful not only for navigating the library but for content as well. In addition, the signs need to be "labeled so that they were more noticeable." This implies that some codes were not easily found and not visually appealing.

FIGURE 2
Level 3 Map of QR Code Locations

Another other issue that surfaced both in the beta test and the alpha test was the wireless connectivity in the building. It appears that despite having "complete" coverage in the building there are some spots that have issues. As stated earlier, one student lost connectivity in the atrium. One beta tester also stated, "[W]ireless coverage in the library cut out at my second stop." Ensuring complete coverage where the codes are located is essential. If the technology does not work, regardless of the reason, the students will not have the patience to continue.

Statistics kept for the beta test via Omniture show that all of the QR codes were used, but not much. Usage ranged from 16 times down to none. This suggests that either the QR codes are not being used or that the pages with redirect code that were set up are not working properly. The code, however, was thoroughly tested which means that the codes were likely just not used. Statistics will continue to be kept so an accurate usage pattern can be discovered.

The Qualtrics survey was not used by the students. This could be due to lack of visibility of the link to the survey or for some other reason. As of the end of fall semester, the survey had been completed only once, with no useful feedback.

Lessons Learned/The Future

Finding the best way to introduce the QR code mode of taking the library tour was complex. Andrew Walsh reflected, "One of the major challenges we faced was increasing the awareness of QR codes within our population of library users."[8] This same challenge was faced by us as well. Since the purpose of the project described above was to introduce the QR codes to freshmen who are taking the FYW requirement, we tried to prevent this issue by approaching the FYW classes individually, speaking to the instructors and students. In addition, the URL for a FYW QR code page, created using LibGuides (http://guides.lib.byu.edu/qrcode), was displayed below each QR code. In coming semesters we intend to collaborate with the campus First Year Experience program, especially the mentors, who have contact with all freshmen. This will be a great opportunity to introduce not only the QR code library tour but also other library services and resources.

We discovered that LibGuides was not the best software for developing the QR code information page. It was decided that a page using the WordPress software would work better. For the future, a page will

be created using a different type of page for QR code information. This will also provide opportunity for including information about other implementations of QR codes in the library. In addition to developing the new QR code information page, each of the pages to which the codes refer students could be developed to contain more information. The tour is currently for hearing students, but the page could contain textual information for deaf users. There is great potential for the pages that the QR codes point to.

In addition to marketing the library tour and QR codes, the codes need to be more visible and attractive to the student. For the investigation described above, the display of the codes was a simple 3" x 3" black-on-white presentation. Colors and varying placard designs should be explored, as well as more visibility of where the codes are placed, since we received feedback about the difficulty in finding the codes. Another possibility to encourage QR code use is to provide some sort of incentive, beyond points the class assignment, perhaps by using other augmented reality tools such as SCVNGR, a challenge based mobile game.

Though using QR codes for the audio tour has not yet been as successful as hoped, maintaining the codes costs very little, so they will remain as another option for completing the library tour. Some of the recommendations given by the testers will be implemented this coming semester (winter 2011) to see if it makes a difference in the usage of the codes.

Another stumbling block for users of QR codes is the cost of the hardware that can use QR codes. Most cell phones with a camera can read QR codes, but cell phones that have the capability to read QR codes using WiFi and connect with the Internet are more rare and expensive. There are not many of this type of phone on our campus yet. However, the use of the new iPod Touch, which includes a camera and WiFi access, works very well. The iPod is not as expensive, and does not require a monthly data plan and, given the popularity, should increase the number of units that could be used to complete the tour using the QR codes.

As we investigate this and other uses of QR codes, "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."[9] Asking the users is always necessary to provide what they need or want, not what we think they want. To this end, we will be asking the students what QR code services they want implemented in our library.

Conclusion

Results of the first semester of QR code usage at our institution were similar to those at other institutions. Although use was not high after one year of QR codes at the University of Bath library, Kate Robinson suspects "as phones become fancier and more of them come with QR Readers as standard it might be time for another 'push.'"[10] As with other new technologies and services, implementation and adoption will come at the pace that the users feel comfortable. The "push" to which Robinson refers will be at that time when the users are ready and willing to learn and adopt the new technology. Continued education and marketing are necessary for exposure and use of these new technologies and services, which will increase the pace of adoption.

While it would be great to say that using QR codes for the BYU library tour was a resounding success, it was not. The experiment was not, however, a failure. On the contrary, much has been learned that can be used to improve the QR code tour and to implement and improve other mobile services. The future of QR codes at the Harold B. Lee library may not be in using them for the library tour, but using QR codes for other services still show promise.

Notes

1. Fleming, Neil. VARK —A Guide to Learning Styles. [cited January 10 2011]. Available from http://www.vark-learn.com/english/index.asp.

2. Pew Internet & American Life Project. Gadget Ownership. 2010 [cited January 10 2011]. Available from http://pewresearch.org/pubs/1763/americans-and-their-gadgets-technology-devices.

3. Walsh, Andrew. 2010. QR Codes—using mobile phones to deliver library instruction and help at the point of need. *Journal of Information Literacy* 4, no. 1:55.

4. Ibid.2010. *Blurring the boundaries between our physical and electronic libraries: Location aware technologies; QR codes and RFID tags.* http://eprints.hud.ac.uk/7760/2/revised_after_review_article_for_The_Electronic_Library_blurring_the_boundaries_minus_front_sheet.pdf ed. Vol. 2010.

5. Robinson, Kate. QR codes and their applications for libraries - a case study from the University of Bath Library - Opus. [cited 09/13 2010]. Available from http://opus.bath.ac.uk/19435/1/Mlibraries_conference_proceedings_KRobinson.pdf.

6. Ibid.Mobile Phones and Libraries: experimenting with the technology. [cited 09/13 2010]. Available from

http://opus.bath.ac.uk/19409/1/aliss_qr_codes_krobinson.pdf.

7. Walsh, Andrew. 2010. QR Codes—using mobile phones to deliver library instruction and help at the point of need. *Journal of Information Literacy* 4, no. 1:55.

8. Miquel, Codina V., Andrés Pérez Gálvez, and Clavero C. Javier. 2010. Mobile services in the Rector Gabriel Ferraté Library, Technical University of Catalonia. *Reference Services Review* 38, no. 2:321–334.

9. Walsh, Andrew. 2009. Quick response codes and libraries. *Library Hi Tech News* 26, no. 5/6:7.

10. Robinson, Kate. Mobile Phones and Libraries: experimenting with the technology. [cited 09/13 2010]. Available from http://opus.bath.ac.uk/19409/1/aliss_qr_codes_krobinson.pdf.