Bar Codes, URLs and Job Aids

Two 2D barcodes are pictured below. 2D barcodes are often called QR Codes (Quick Response Codes). Unlike a traditional bar code, which is a series of wide and narrow lines and spaces that represent a number, a 2D barcode is a square filled with dots, which sometimes connect to form patterns and can represent a full symbol set – as, for example, a URL string. Various devices, including smart phones and PDAs (Personal Digital Assistants, i.e. an iPad), can read 2D barcodes, using a 2D program in conjunction with the PDA's camera. These devices can interpret the codes as commands to access a URL site and to display the website information on the reader. Thus, for example, if I have the required application on my iPhone and use its camera to read (scan) either of the 2D matrices pictured below, I will find myself on the google.com website.

http://google.com encoded in a QR Code.

http://google.com encoded in a Datamatrix code.

At the moment, there are competing standards for 2D barcodes, but one or a few will eventually emerge and be supported by all smart phones and PDAs.

A few of the applications available for reading 2D Barcodes include the following. Those with an asterisk after them provide source code.

- **Kaywa Reader** is one of the most impressive commercial readers. Notably, it can recognize codes in a video stream from the phone's camera. The user never needs to press a button to take a picture.
- **Libdmtx*** is an open source (LGPL) library for decoding Datamatrix codes. It is designed to be highly portable, and it is written in C. It was recently made available again after a year-long break.
- **ZXing*** is an open source (Apache 2.0) application recently released by Google that aims to "support decoding of QR Codes, Data Matrix, and the UPC family of 1D barcodes."
- **Open Source QR Code Library*** - This is an open source decoding library from Japan.

One way or another, this innovation will soon be incorporated in lots of PDAs. And, application code, like the apps given above, will be incorporated into various software programs and perhaps into operating systems.

Nature of the Innovation

Let's assume I sell a piece of hardware - a medical device, for example - and want to provide a user manual that can be downloaded as needed. I can put the URL on the device, however, anyone who has looked at a URL from a large site will quickly realize that URLs are becoming longer and more complex. For example, here is the URL for an Article on 2D bar codes:

http://www.cs.columbia.edu/~hgs/research/projects/iPhone-barcode/report.html

You can try typing each character in the URL into your smartphone keyboard, but if you get one character wrong, you won't land on the correct site. Now, imagine that the device has a 2D barcode and all you need to do is point your smartphone camera at the barcode and the manual appears on your smartphone. It is a lot easier and considerably faster.

Value of This Innovation

In December of 2009, Jim Boots, then Senior BPM Advisor at Chevron, and I authored a short Article titled "From Process Analysis to Employee Job Aids." (Search on Jim Boots at www.bptrends.com.) In that Article, we discussed how Chevron had used Nimbus Control – a BPMS product – to create job aids that described the steps to be followed in responding to different kinds of emergencies. The various

response sequences were placed on the web so that Chevron people, anywhere in the world, could quickly access the appropriate response sequence.

Obviously, the limit to the approach that Jim and I discussed was the availability of computers. What happens if the emergency occurs somewhere where there are no computers? Now, imagine that, at various points in Chevron environments, there are red Safety Information placards with 2D barcodes. Anyone with a smartphone or PDA can quickly go to the placard, access the application and find the procedure to be followed.

As an aside, I learned about all this talking with Ian Gotts, the CEO of Nimbus, who has already set up a version of Nimbus Control to run on iPads and is exploring how to integrate this approach into the Nimbus Control package. I fully expect that lots of other BPMS vendors will soon be doing the same.

Separately, in a BPTrends Column by Carol Haig and Roger Addison titled "Performance Architecture: The Checklist – The Great Equalizer" there is a review of Dr. Atul Gawande's book, *The Checklist Manifesto*. This book is a great introduction to the use and value of checklists in hospital environments. The point Dr. Gawande makes is that human performance is often significantly improved when people follow checklists.

Let me make a prediction: The medium in which most checklists will soon be available is the PDA. One can create checklists on paper, but six checklists require six pages, and one page can easily be misplaced. If I were planning to create a number of checklists for a hospital environment, I would create them in digital form and assume people could access them via a PDA. In this way, any checklist would be available from any location, instantly, in whatever language the person using the PDA required.

Some Uses

To underline the point, one of the major users of 2D barcodes, to date, is the hospital equipment industry. One major use has been to put 2D barcodes on hospital equipment. If someone in the hospital needs information on a piece of equipment, they simply point their phone or PDA at the 2D barcode and access the information on line.

Ian Gott's Article on 2D barcodes, which is at the blog site listed below, includes a list of some possible uses which he found on Flyteblog.com. I've taken the liberty of including a few of the uses to give you some ideas. Ian's blog also contains some additional clever ideas.

1. **QR Codes on bus stops, train stations and**

subway stations: A quick scan would give you realtime information on when the next bus, train or subway would arrive.

2. **Posted next to paintings and sculptures at museums.** Great for visitors who want to learn more about the artist, the time period, and the reaction to the photo.
3. **On historical sites and on walking trails.** Sure, a plaque is fine for some, but I'd like to delve deeper, whether with a Wikipedia entry, or a video of a local historian explaining the significance of the site.
4. **On For Sale signs.** Whether residential or commercial, for sale signs could include codes that have all the information a sell sheet includes, plus video walkthroughs.
5. **Next to packaged food in groceries.** Give shoppers quick access to recipes that include the ingredients they see on the shelf.
6. **On bottles of wine.** It would be nice to be able to get info about the vineyard, and maybe buy a case of a wine recently enjoyed at a restaurant.
7. **At the bottom of all newspaper and magazine articles.** Then you could quickly get to the online version and see the comments that other readers had left.
8. **As a temporary tattoo.** Link it to your Facebook profile or Twitter account.
9. **You can even get t-shirts printed with QR Codes,** presumably linking to the wearer's Facebook site so you can check them out rather than walking up and talking to them.

Anyone working on a process redesign who wants to provide information in a complex environment, and is concerned about how best to make it available, ought to consider this approach. By keeping the documentation digital, one makes it easy to update or to translate, and one avoids killing trees. More important, one makes it available to anyone with a smartphone or PDA who needs it in an instant. To do this today, you would probably worry about making PDAs available and assuring that they were equipped with an appropriate QC reader, but in the near future these, things will be widely available and one will be able to take advantage of this powerful and flexible new way to help employees or customers access important information, quickly.

Til' Next Time

Paul Harmon

For more information:
http://iangotts.wordpress.com/2011/05/17/got-a-problem-take-a-photo-of-a-qr-barcode-bpm-qrcode-innovation/

http://en.wikipedia.org/wiki/QR_code
http://welldonemarketing.com/2011/07/05/8-uses-for-qr-codes-in-healthcare-marketing/

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