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Libraries Using QR Codes to access voter register and support the Electoral process in Uganda

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Abstract:

Libraries promote several services including outreach and exhibitions but there is often lack of methods and techniques that target the intended audiences. There is a need for libraries to reach out to users through mobile devices with enhanced visualization techniques. The aim of this paper is to demonstrate how QR codes can become a technique of reaching out to library users by supporting users to access open and public data particularly, open government data. Specific objectives were to describe the voters register as open or public information and to reveal how Makerere University Library used QR codes to access the voters register and support the electoral process in Uganda.

The paper discuses cases where the published open data is maintained by the library, and there is a possibility to assess the impact of mobile device services using altimetrics techniques that provide statistics showing URL downloads by particular device and timelines. This valuable information can be enhanced by visualisation techniques such as zooming in and out, bubbles, colours and shapes of the visual to create insights about the usage of the URL and prompt appropriate management decisions. The only challenge with open government data is that the URL used to generate the QR code is often unreliable and hence requires regular updating of the generated QR code.

The paper's key message is to show that in order to reach out to users; libraries can use QR codes as an information delivery service to mobile device to access open data that is of importance to the users.

Keywords: Library Outreach Program, QR Codes, Open Government Data, Uganda Electoral Process, Voter Register.

Introduction

Library users are able to use QR codes to access government portals using mobile devices such as smart phones, tablets, etc. QR codes are two-dimensional bar codes that can contain any alphanumeric text and often feature URLs that direct users through a process known as mobile tagging to sites where they can learn about an object, information or place. It requires a reader app installed to a phone or tablet that can read QR codes printed on posters, menus, newspapers, business cards, billboards, buildings among others. Several QR reader apps are free (EDUCAUSE Learning Initiative, 2009). QR codes have numerous uses. Educators are able to incorporate a QR code into a slide or poster where they can have specific course notes or additional information published on the web. By scanning the QR code students are directed to the supplementary information. This entire process kick-starts widespread thinking and innovation around information connected to locations and objects (Law, 2010). Similarly, this process provides methods and techniques for librarians to target the intended audiences and also reach out to users of open government data through mobile devices.

The Issue

Potential library users who would have accessed libraries continue to rely on efficient giant search engines such as Google and social media as a starting point for information search instead of the library subscribed resources. This affects the number of library users (Carlson, 2001; Counts, 2008). Yet, since the advent of the internet, the library has become one of the most transformed departments on most campuses. It may look very much the same on the outside, but the resources and services have been and continue to be significantly altered to prove their existence for example; traditional books are replaced by e-books, journal articles are replaced with subscriptions to electronic journals that can be accessed via the internet (Dotson, 2008). Libraries promote several services including outreach and exhibitions but there is often a shortage of methods and techniques that target the intended audiences. There is therefore, the need for libraries to reach out to users through mobile devices with enhanced visualization techniques.

Aim of the opinion paper

To demonstrate how QR codes can become a technique of reaching out to library users by supporting users to access open and public data.

Specific objectives

1. To describe the voters register as open or public information;
2. To reveal how Makerere University Library used QR codes to access the voters register and support the electoral process in Uganda.

Literature Review

Internet and its effect on numbers of Library users

The internet is a competition to library services because most of the clues towards information needs by potential library users are found on the internet and thus affecting the number of users accessing library resources (Carlson, 2001; Counts, 2008). On the other hand, since the advent of the internet, the library has become one of the most transformed

departments on most campuses. It may look very much the same on the outside, but the resources and services have been and continue to be significantly altered to prove their existence (Dotson, 2008). Among the services altered is outreach service which is about the basic willingness to do what is necessary to serve the un-served (Hallmark, 2007). Although outreach is often used interchangeably with synonyms such as extension and the phrases "service to the disadvantaged" or "un served," and "community", the concept is that service must be proactively extended beyond the walls of the library building to the actual area of need for service. Modern outreach services seem to focus on delivery mechanisms to external library users. The product that is delivered is usually available within the library building while assuming that these deliverables are among those that the community needs and desires. Some of the objectives of outreach library initiatives include; improving access to resources, collections and information technology; expanding library service efforts to the un-served but potential patrons within the library community while extending services and programs to non-traditional library users and underserved categories. Unfortunately, attaining these objectives comes with pertinent challenges where the new service populations targeted in these initiatives may require new materials attracting additional funds and usually libraries run a limited budget. More so, there may be limited mobile computing hardware, software and computer technology support for offsite library instruction and related activities (Cawthorne, 2003).

The role of the library in providing access to open data and support to citizens

Regardless of above mentioned challenges for outreach library initiatives, libraries have evolved into a primary source of internet access in many communities, generating wide-ranging impacts in the communities (Bertot, 2008; Casey, 2006). Typically a community has an identity and is when people see themselves as sharing beliefs, values and goals. Communities are generally geographically based, although online communities continue to develop and evolve (Putnam, 2000). There is a growing trend in libraries in Africa on open access (OA) because it permits unrestricted use, distribution, and reproduction of data in any medium once the original author and source are credited. This trend has showed increasing importance to open data and e-government services. Government agencies are now directing citizens to local libraries when they need help in using e-government sites (Bertot, 2006; Jaeger, 2007).

Open data (OD) is an emerging term in the process of defining how scientific data may be published and re-used without price or permission barriers because scientists believe published data belongs to the scientific community. The emphasis of the concept "re-use" differentiates open data from open access and open source. However many publishers claim copyright over data and will not allow its re-use without permission and this is a major impediment to the progress of scholarship in the digital age (Murray-Rust, 2008). Freedom to use, re-use and redistribute without restrictions beyond a requirement for attribution and share-alike is the definition of open knowledge. Any further restrictions make an item closed knowledge. The process of requesting and obtaining permissions and data was extremely time consuming before online information materials. Finding out the rights one has to re-use data is still confusing even with online materials, because the licensing terms remain unclear to most users (Molloy, 2011).

Open government data is data accessible online, in standard and re-useable formats, and under licenses that allow data to be re-used in different context (Davies, 2010). Government holds large significant datasets because of its mandate to collect and disseminate information;

although its historical monopoly on processing and interpreting data has been undermined by an increasingly digital society where data can be transferred and analyzed using freely accessible platforms and tools (Davies, 2010). Several reasons have been put forward to justify the release of government data including; transparency and accountability, citizens' greater control over public sector reforms, economic benefits among others (Davies, 2010). Many local and national governments have created "data portals" to list their available open government data. The pressure to government for open data came from a public sector information (PSI) lobby focused on commercial re-use of data and from campaigners interested in open governance and freedom of information (FOI) as well as from global recommendations through the Sustainable Development Goals (SDG) under the target 16.10 that ensures public access to information (Davies, 2010).Governments have taken advantages of cloud computing and are involved in digitization of transactions including tax revenue payment systems, utility billing and the electoral processes thereby becoming robust in data collection and storage (Zissis, 2010).

Aspects of open data have been integrated into national legal frameworks in Uganda, including; Access to Information Act, 2005 (The Republic of Uganda, 2005) and the notorious Whistleblowers Protection Act, 2010 (The Republic of Uganda, 2010) that provides for procedures by which individuals in both private and public sector may disclose information that relates to irregular, illegal or corrupt practices as well as providing protection against victimization of persons who make disclosures. Legal support for free access to information and protection against victimisation of disclosures of information encourages usage of open government data.

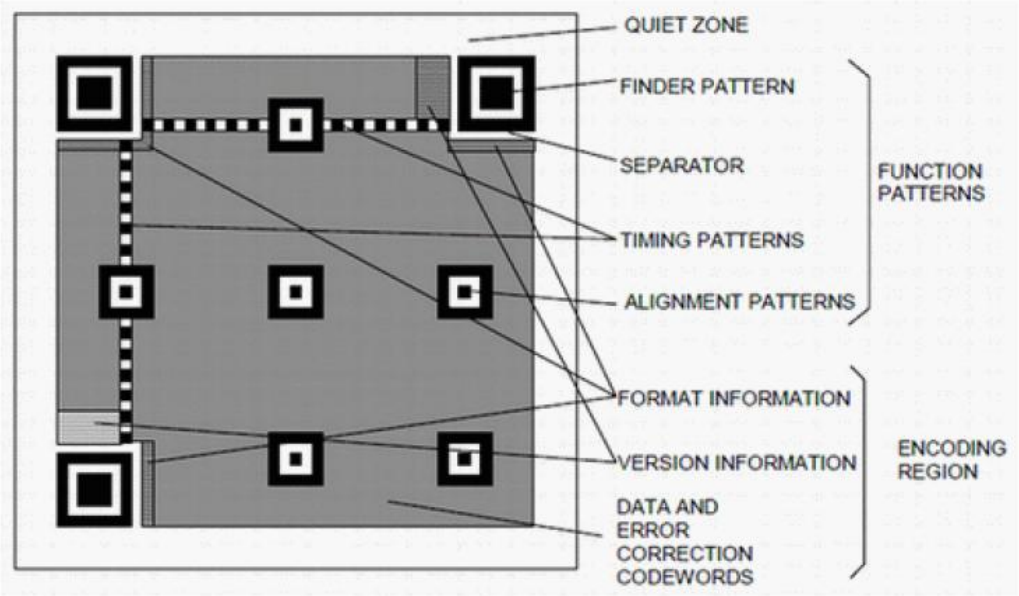
QR Codes

Library users are able to use QR codes to access government portals using smart phones, tablets and other mobile devices. The first QR standard code was created by a Japanese company, Toyota, in 1994 to facilitate the management and monitoring of motor vehicles and spare parts in the vehicles industry by creating a means of labelling that could be read quickly hence the name "quick response code". Today QR codes are found in many fields such as advertising, interior designs, architecture, art, fashion and high popularity in librarianship and marketing by authentication within a web page to encode useful information (Pop, 2015).

Information is one of the most valuable assets today to improve living and sharing information is an integral part of modern society. Creating means of labelling that could be deciphered or read quickly becomes necessary to share the huge amounts of information required today. Coding information is one of the means of labelling and bar-codes on all commercial products, invoices, certificates play a crucial role in information sharing. One of the modern means of coding is the quick response code (QR Code) (Coroiu, 2010).

QR codes allow users with their own smart phones, tablets and other mobile devices to access references of hidden behind code about information encoded using a cryptographic algorithm. Quick Response Code (QR codes) and codes with "quick response" is a range of coding standards bars dimensional (2D barcode) known as code matrix (matrix barcodes). A QR code consists of black modules like square points and square dots, arranged in a square grid placed on a white background which can be read by a device image such as a camera; and processed using Reed-Solomon algorithm error correction until the image can be interpreted properly. The data extracted from the modules present in both horizontal components and the vertical image. The square modules have two regions including; region coding (information

about alignment, formatting, and coding of data and error correction) and function templates (separators, templates for position detection for timing and alignment). Data in the square modules is represented in two binary 1 and 0 values for dark modules and light modules respectively (Simon, 2011). In the year 2000, the International Organisation for Standardization (ISO) approved one of its international standards specifications of the QR codes (ISO-IEC-18004, 2000).



Structure of a Quick Response Code (QR code) (ISO-IEC-18004, 2000)

QR codes are two-dimensional bar codes that can contain any alphanumeric text and often feature URLs that direct users through a process known as mobile tagging to sites where they can learn about an object, information or place. It requires a reader app installed to a phone or tablet that can read QR codes printed on posters, menus, newspapers, business cards, billboards, buildings among others. Several QR reader apps are free (EDUCAUSE Learning Initiative, 2009). Educators can create QR codes for cause resources and embed them into slides, course materials, handouts, syllabus documents, quizzes or coursework downloads among others (Pattar, 2011). Educators can solicit student feedback as well especially for closed questions (Ramsden, 2008). In order to incorporate a QR code into a slide or poster, have specific course notes or information published on the web, cut and paste the URL for the notes into the appropriate QR code generator and click generate. The URL will convert to a QR code; save the code to a computer and insert the code into the power point presentation. This entire process kick-starts widespread thinking and innovation around information connected to locations and objects (Law, 2010).

Implementation approach

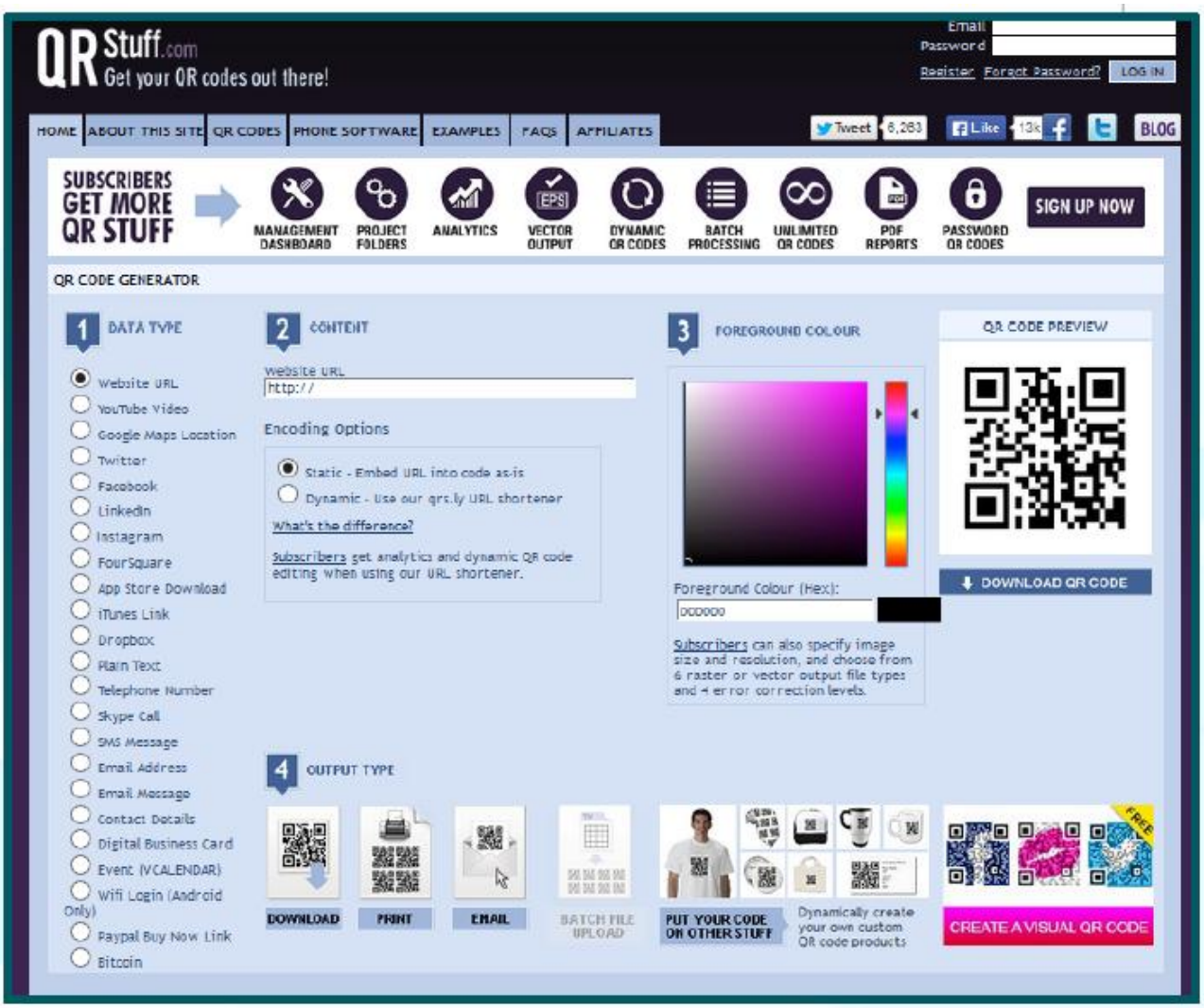
How Makerere University Library used QR codes to access the voters register and support the electoral process in Uganda

Makerere University library is mindful of the concept of outreach services, that library service must be proactively extended beyond the walls of the library building to the actual area of need for service; and is motivated by modern outreach services that seem to focus on delivery mechanisms to external library users and what is delivered is also available within

the library building while assuming that these deliverables are among those that the community needs and desires (Cawthorne, 2003). On the other hand, Uganda was to have a newly elected President of Uganda in the on 18th February 2016. The University community has a huge number of eligible voters with polling stations. Previously there were situations where a large number of voters did not vote due to changes in location of their polling stations - an issue they discovered late after closure of polls (COG, 2011; Gibb, 2012).

The Library is not only ambitiously subscribing and accessing open government data and other library databases, but has included them in the robust information literacy programs supported by ITOCA and the Consortium for the Uganda University Libraries (CUUL) where in 2015 alone, 60 librarians from 25 institutions in Uganda where trained to train users to access these and other relevant resources from Makerere University Library and its partners. Demonstrations on how to download, install applications and use of mobile devices to access information resources were included in the training; and this, together with social influence of library users (crowd pulls), created a section of university community that accesses information using QR codes printed on posters.

Staff in the digitisation section identified URLs for government portals specifically the Uganda Electoral Commission portal (http://www.ec.or.ug/search/byid/) that provided voter information including; voter name and ID, location of one's polling stations among others. The URL was cut and pasted into a selected free QR code generator shown below and accessed at http://www.qrstuff.com/index.html.



Free *QR code generator accessed at http://www.qrstuff.com/index.html*

The URL was converted to a QR code shown below and the code was saved to a section computer and later included in the design and printing of a poster that was displayed all over the constituencies to be accessed using phones or tablets and other mobile devices months before the polling date. This supported eligible voters to be in the correct line by 7:00am as required by the law.

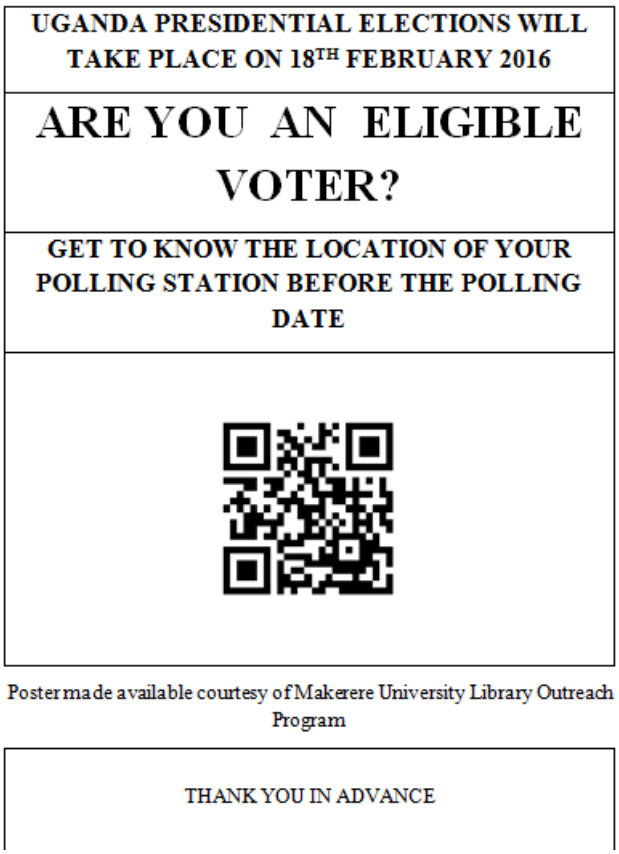


Fig. Poster showing the QR code for locating a voter's polling station months before the polling date

Discussion

Displaying posters with QR codes is a library mobile device service and one of the many ways to reach out to users at their frequent points with an aim of accessing open data and open information resources. From the citizens' point of view, libraries may use mobile devices to support SDG target 16.10 "ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements" and impact on the communities. In cases where the published open data is maintained by the library, there is a possibility to assess the impact of mobile device services using altimetrics techniques that provide statistics showing URL downloads by particular device and timelines. These valuables can be enhanced by visualisation techniques such as zooming in and out, bubbles, colours and shapes of the visual to create insights about the usage of URL and prompt appropriate management decisions. The only challenge with open government data is that the URL is often on and off, hence not reliable, requiring regular update of the generated QR code.

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