The Implementation of Mobile Libraries (M-Libraries) in Open University Malaysia

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Abstract

This paper highlights the implementation of mobile libraries (m-libraries) initiative in Open University Malaysia (OUM). Established to expand its reach to existing user base and increase its appeal to segments that were previously unreachable, this initiative will support the concept of ubiquitous learning among OUM Learners. The usage of m-libraries among OUM community also will be discussed. Type of information retrieved when using m-libraries will be elaborated. The role of Quick Reading Codes (QR-Codes) in m-libraries environment and findings on usability test on the implementation of OUM m-libraries will be presented. Finally, the future of m-libraries will be briefly discussed.

Keywords: Mobile libraries (m-libraries), Academic libraries, Mobile devices, QR Codes, Ubiquitous learning

1.0 Introduction

According to Malaysian Communications and Multimedia Commission (MCMC), mobile phone penetration rate in Malaysia is 127.7% in 2011 (Malaysian Communications and Multimedia Commission, 2012). It shows that almost every Malaysian own at least one mobile phone. The statistics also shows that 28% of mobile phones users subscript to 3G services and more than 740,000 hotspots and WiFi facilities are provided all over Malaysia. These figures indicate that accessing internet through mobile phones is a not a barrier to Malaysians nowadays.

Open University Malaysia (OUM), the pioneer in open and distance learning (ODL) in Malaysia, has set its mission to widen access to quality flexible education and provide lifelong learning opportunities by leveraging technology and adopting flexible mode of learning. One of the flexible modes of learning is through mobile technologies. Mobile learning, for instance, has been introduced by the University in 2009. Mobile Learning via SMS was initiated to help reduce the transactional distance of psychological and communication space often faced by distance learners who are separated in terms of geographical distance and time (Mobile Learning@OUM, 2010). In August 2011, the University's Library, the Tan Sri Dr Abdullah Sanusi Digital Library (OUM Digital Library), has initiated and introduced OUM Mobile Library to support its learners in their acquiring knowledge and learning process. At another level, the OUM Mobile Library is able to embed the University's learners learning activities in their everyday life.

Mobile Libraries (M-Libraries)

The concept of mobile libraries or known as m-libraries is relatively new in Malaysia. However, in other part of the world such as United States, Canada, Australia, United Kingdom, Spain and Singapore, m-libraries has been introduced and implemented as early as year 2000. M-libraries are libraries that deliver information and learning materials on mobile devices such as cell phones, PDAs, palm top computers and smart phones to allow access by anyone from anywhere and at any time (Needham and Ally, 2008). This will result that the library services and information in the library are able to be accessed anywhere and anytime using these mobile devices. Apart from offering convenience, mobile libraries present new opportunities for libraries to promote access and expand reach to existing and prospective users. M-libraries have make libraries become more ubiquitous to users. Users now can use any service provided by the library even while in commuting as opposed to the conventional libraries whereby learners are confined to physical structure or building. This results in learners having control of when they want to learn and use library's resources. The services can be as simple as sending text message alerts about reservations of available books, or as complex as the Athabasca University Library's Digital Reading room, which allows readers to access eBooks and journal articles through their library's subscriptions on any mobile devices (Needham and Ally, 2008).

According Vollmer (2010), libraries can provide the following mobile services through m-libraries:

- Mobile online public access catalog (OPAC)

- Mobile library instruction

- Mobile library databases

- Library Short Message Service (SMS) notifications

- SMS reference

- A webcam so users can check on congestion in the library

With all or almost all of the services available via patrons' mobile devices, information on libraries will be always in their accessed. Information on library physically, such as availability of discussion rooms and PC terminals in the libraries, which now can be known instantly in their mobile devices, will indirectly increase the number of usage and visits to library.

Developing OUM M-Libraries

The OUM Mobile Library was initiated and introduced in August 2011. The process of developing it has been started in March 2011 and it takes about 6 months to develop and establish a suitable and compatible mobile libraries interface to the OUM Digital Library portal.

Technically, developing a mobile interface for OUM Mobile Library involves programming schematics and several software components, notably the Wireless Universal Resource File (WURFL API) and Drupal Module, the Mobile Tools. Using WURFL API is a smarter solution for detecting any mobile device and devices capabilities. Since there are hundreds of devices and each devices may have hundreds of properties, using generic template for mobile devices may not be enough. This is where WURFL API plays its role:

- Browsers are different, but they also have many features in common with one another.

- Browsers/devices coming from the same manufacturer are most often an evolution of the same hardware/software. In other words, differences between, say, a iPhone 3 and a iPhone 3S are minimal.

- Devices from different manufacturers may run the same software. For example, the Android OS runs on devices from Motorola, HTC, Samsung, ZTE, Huawei and others.

WURFL allows any device to load any web page based on its capabilities. For example, Nokia shipped several subversion of the 7110 model. Some of those did not support WML tables and some did. It is not safe to assume all devices support WML tables by default, as the content will not be displayed as expected (ScientiaMobile, 2012).

Having different devices with different capabilities in mind, OUM Mobile Library makes use of WURFL API, Drupal Mobile Tools Module and conditional CSS to cater each device with different capabilities. More powerful device will have extended display such as better button and dialog boxes and the less powerful devices will have lighter theme to reduce CPU load. All in all, these Mobile Web Toolkits make OUM Digital Library mobile friendly.

The Interface

Mobile Library is not just a library portal which can be accessed via mobile devices. Many features and links from the portal have to be adjusted and organised in order to optimise the impact and functionality of Mobile Library. Below is the screenshots of OUM Library Portal and OUM Mobile Library.
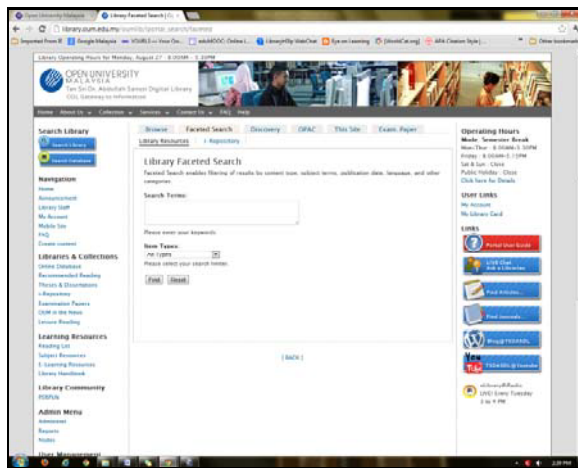

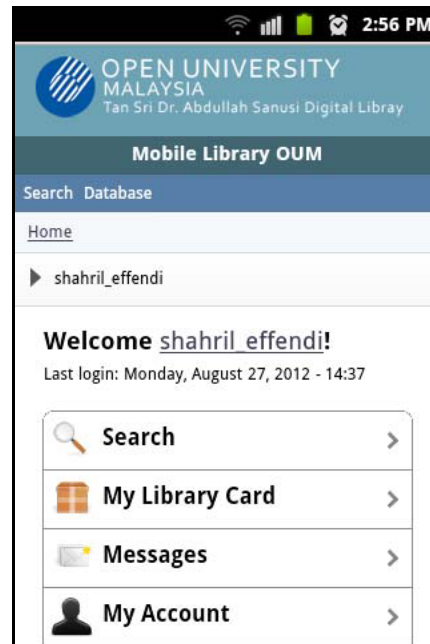**Figure 1: OUM Library Portal**   **Figure 2: OUM Mobile Library**

Note that only important and necessary links and features are provided and included in OUM Mobile Library (Figure 2). The reasons of limited links and features in Mobile Library are due to limited data capability of most mobile devices to download all features in desktop interface. Hence, time to download features and links in Mobile Library will be faster and more efficient if only necessary features are includes in the Mobile Library interface. Another reason for only selected features and links in Mobile Library interface is information searching behaviour when a patron using mobile device. According to World Wide Web Consortium (W3C) technical document, Mobile Web Best Practices 1.0 (MWBP), "mobile users typically have different interests to users of fixed or desktop devices. They are likely to have more immediate and goal-directed intentions than desktop Web users. Their intentions are often to find out specific pieces of information that are relevant to their context." (2008). Hence, besides features and links, layout of Mobile Library also plays an important role in assisting users to retrieve information in fast and accurate manner using mobile devices.

Usability Testing

In January 2012, the OUM Library has conducted usability testing of mobile version of its website. The respondents indicated that the main areas of the website which they would like to access via their mobile devices are the library's Contact Information (86.5%), Loan Details (79%) and Search the Library (OPAC) (68.6%). Based on the findings of the testing, the OUM Mobile Library has evolved and changed the layout of the mobile version of the library website according the above findings as in Figure 3 and Figure 4.
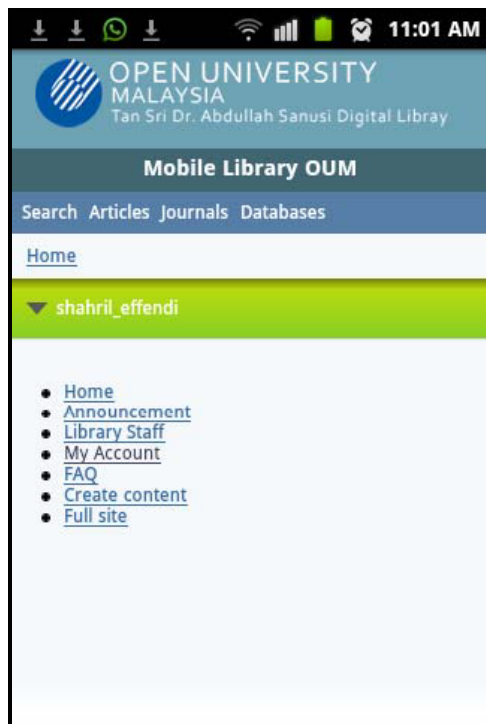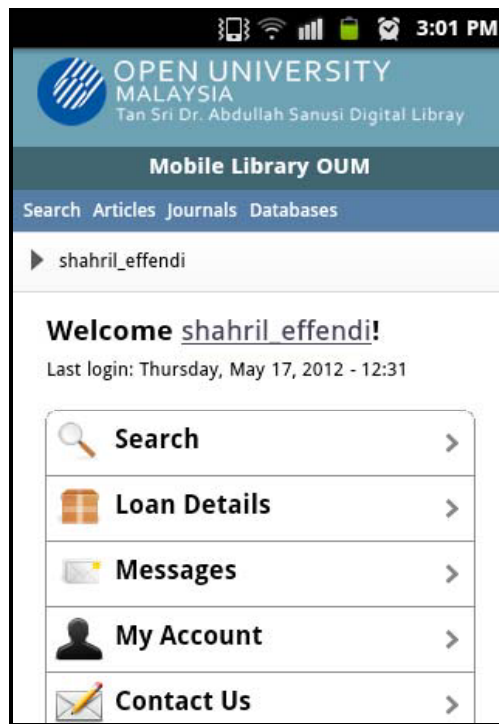

Figure 3: Before   **Figure 4: Now**

Features of 'Contact Us' and 'Loan Details' have been moved to main page as these 2 are the main features and links visited by most patrons via mobile devices. Simple and larger icons and fonts are also been included in the new layout as it make the layout more attractive and easier to tap at the mobile devices screen.

QR-CODE

QR-Code is one of the factors in attracting users to use m-libraries. This printed two-dimensional bar code is readable by the cameras on most of mobile devices including smart phones. These mobile devices, then, will translate and display the information in the QR-Code. This information is normally a URL that the mobile devices then use to pull up a library's web page or portal. In short, in m-libraries environment and application, QR-Code acts as an authentication entry before one can enter the library portal via mobile devices. Users do not have to type-in their username and password anymore every time they want to visit the library portal via their mobile devices. Figure 5 is an example of QR-Code.
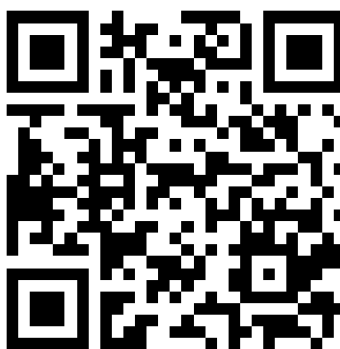
Figure 5: Example of QR-Code

Besides as authentication entry, QR-Code also is being used in libraries on library catalogue. QR-Codes are attached to library catalogue records, thereby allowing students to capture bibliographic and location information on their mobiles (Robinson, 2010). QR-Codes are also can be applied during literacy lessons, where links to other media such as YouTube videos placed on handouts.

Measures of Success

How many hits on the mobile sites before you consider a success? As to what constitutes success, there are many ways to determine and measure the use m-libraries. According to Griffey, it's probably best to think about the number in terms of percentage of total visitors to mobile sites. For a centre of a wired and connected community such as the public libraries and academic libraries, something between 2 to 5 percentages might consider as success (Griffey, 2010). The OUM Mobile Library recorded 3.18% of total users access the Library portal via their mobile devices. It means that for every 100 users visit the Library portal, 3 of them visit it via their mobile devices. The Library positively believe that the figure will be increased as more promotion and learners know about this OUM Mobile Library.

On reference service via mobile such as chat, instant messaging and e-mail, to determine the level of success is similar to judging the success of any reference service. Number of users in using the service and percentage of questions answered are some of the indicators to determine the success of the services. Usage of libraries via mobile may also increase one visit to library portal via desktops or laptops. According to Usability Testing conducted by OUM Library, 92% of the respondents reveal that their visit

to the library portal via desktops or laptops increase after they started accessing libraries via mobile. Hence, in general, the implementation of m-libraries will also enhance the usage or visit to library portal.

The Future

In next five to ten years, as mobile technology become more powerful and less expensive, location-based services and ubiquitous connectivity are two main areas that should be focused. As every mobile device is going to be GPS-enabled, m-libraries will be able to provide services based on location of their patrons. Availability of a particular printed book, for instance, will be based on the nearest branch library and not based on Main Library. This will result a personalised library services to patrons.

On ubiquitous connectivity, the core services of most libraries, that are reference and circulation, have the potential to be distributed to point-of-need services that are no longer attached to a physical space (Griffey, 2010). More and more reference queries will be via mobile devices as patrons need information instantly even when they in commute. Chatting with librarians via mobile devices is another element which may be added in OUM Mobile Library services in the near future. Mobile checkout also is a possible service in the future. Patrons can check items out to themselves using their mobiles while standing between the book shelves. Another potential mobile implementation for libraries is live streaming of video. Patrons can have a conversation with librarians on problems they are facing on their library portal, for instance. By just show their library portal screen via live streaming video using their mobile devices, patrons can easily communicate with librarians on their problems.

Conclusion

Mobile applications can support learning processes by making library resources more ubiquitous, by bringing new users to the library through increased accessibility to the resources libraries offer, and by creating a new way to enhance connections between patrons and libraries. This increased use of mobile phones provides an untapped resource for delivering library resources to patrons (Griggs, Bridges, Rempel, 2009). In line with advancement of mobile technologies, libraries must fully utilise this m-libraries technologies in order to provide a wider and more ubiquitous access to libraries. The sharp increase in the use of Wi-Fi enabled phones, for example, has reduced the cost of accessing m-libraries to virtually zero. Increasing number of patrons which consist of new generations such as Gen-Y users will increase the demand of accessing libraries via mobile. The increasing size and connectivity of social network through mobile also provide opportunity for libraries to promote and increase the usage of m-libraries.

The OUM Mobile Library initiative indeed has fulfilled the two dimensions of ubiquitous learning to the University's Learners. First, it has demolished the constraint by physical space, plans or timetables. OUM Mobile Library has changed learning and acquiring knowledge pervasive and occurs anywhere at anytime. Second, with ability to access information in immediate time to a variety of sources, it has provided OUM Learners to understand information and knowledge and the ability to question experiences and information (Nicholas, 2010).

References

Griffey, J. (2010). Mobile technology and libraries. London: Facet Publishing.

Griggs, K., Bridges, L. M. & Rempel, H. G. (2009). Library/mobile: tips on designing and developing mobile web sites. *Code4Lib Journal, (8).* Retrieved from http://journal.code4lib.org/articles/2055

Hanewald, R. & Ng, W. (2010). The digital revolution in education: digital citizenship and multi-literacy of mobile technology. In Ng, W. (Ed.), *Mobile technologies and handheld devices for ubiquitous learning: research and pedagogy* (pp. 1-14). Hershey: Information Science Reference

Jacobs, M. L. (2009). Libraries and the mobile revolutions: remediation=relevance. *Reference Services Review, 37 (3)*, 286-290. doi : 10.1108/00907320910982776

Lippincott, J.K. (2010). A mobile future for academic libraries. *Reference Services Review*, *38 (2),* 205-213. doi : 10.1108/00907321011044981

Malaysian Communications and Multimedia Commission (MCMC) (2012). Communications & multimedia pocket of statistics Q1, 2012 . Retrieved from : http://www.skmm.gov.my/ skmmgovmy/media/General/pdf/C-MQ1_Eng2012.pdf

Needham, G. & Ally, M., (Eds.), (2008). M-libraries: libraries on the move to provide virtual access. London: Facet Publishing.

Nicholas, H. (2010). Ubiquitous computing does not guarantee ubiquitous learning in schools : the case of handheld computers. In Ng, W. (Ed.), *Mobile technologies and handheld devices for ubiquitous learning: research and pedagogy* (pp. 30-44). Hershey: Information Science Reference

Open University Malaysia. Mobile Learning@OUM (2010). Retrieved from: http://mobilelearning.oum.edu.my

Rabin, J. & McCathieNevile, C. (Eds.). (2008). W3C Mobile Web Best Practices 1.0. Retrieved from http://www.w3.org/TR/mobile-bp/

Robinson, K. (2010). QR codes and their applications for libraries – a case study from the University of Bath Library. In Needham, G. & Ally, M. (Eds.), *M-libraries 2: a virtual library in everyone's pocket* (pp. 81-83). London: Facet Publishing.

ScientiaMobile. How does WURFL work? (2012). Retrieved from: http://wurfl.sourceforge.net/wurfl_schema.php.

Shahril Effendi Ibrahim & Ahmad Munawar Mohmad Anuar. (2012). Mobile Libraries (M-Libraries) for Academic Institutions. *International Conference of Libraries (ICOL) 2012*. Malaysia.

Vollmer, T. (2010) There's an App for That! Libraries and Mobile Technology: An Introduction to Public Policy Considerations. Washington, D.C.: American Library Association. Retrieved from: http://www.ala.org/ala/aboutala/offices/oitp/publications/policybriefs/mobiledevices.pdf

Zoraini Wati Abas, Lim, T. & Woo, T. K. (2009). Mobile learning initiative through SMS: a formative evaluation. *ASEAN Journal of Open and Distance Learning* (1) 1, 49-58.