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Role of Mobile Communication and Technology Services in Educational Libraries

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Abstract

Libraries have been working to develop network–ready services. Mobile communication intensifies this activity and adds new challenges as they look at what it means to be mobile–ready. This has organizational implications as a shift of emphasis towards workflow integration around the learner or researcher creates new relationships with other service organizations on campus. It also has implications for how space is used, for library skills, and for how collections are developed. Services may be made mobile–ready, as with special mobile interfaces for library services, alerting services. Mobilization continues the restructuring of services, organisations and attention that networking has brought about.

Keywords: iPhones, Mobile Application, Library Services.

Introduction

Learning and using mobile technologies[1] such as mobile phones/smart phones, iPhones, PDAs (Personal Digital Assistant) iPod is boon especially for the people who are busy with their work and whose jobs require them to continuously move. But mobile applications for information seeker too have grown up tremendously with the growth of technology.

This article presents on overview of trends in mobile tools and its application for libraries, including the internet mobile, Mobile multimedia and SMS/texting etc; examines mobile search providers and potential applications for information seeker and librarians. Analyses the present usage of mobile devices, providing on overview of devices providers and features, describing the various activities these devices support for well library use focusing how libraries and our librarians are responding with services tailored for these devices.

In the records, it has been stated that in United States the Mobile phones have been used by 18-24 age group in the year 2007 , who definitely are students , scholars, working class who need these kind of devices to educate them in" Move and learn" environment. Nation wide current study in mid 2008 on the mobile phone users on the whole declares that 75% of adults and 90% of college students have mobile phones and 62% of subscribers use text messaging regularly. Landline phones are no longer in use now.

Definition

A mobile phone or mobile[2] (also called cellphone and handphone) is an electronic device used for mobile telecommunications (mobile telephone, text messaging or data transmission) over a cellular network of specialized stations known as cell sites.

Wikipedia.

Features of Mobile

Mobile phones[3] often have features beyond sending text messages and making voice calls, including call registers, GPS navigation, music (MP3) and video (MP4) playback, RDS radio receiver, alarms, memo and document recording, personal organizer and personal digital assistant functions, ability to watch streaming video or download video for later viewing, video calling, built-in cameras (1.0+ Mpx) and camcorders (video recording), with auto focus and flash, ringtones, games, PTT(Push-To-Talk), memory card reader (Secure Digital Card), USB (2.0), infrared, Bluetooth (2.0) and Wi-Fi connectivity[4], instant messaging, Internet, e-mail, browsing and serving as a wireless modem for a PC, and soon will also serve as a console of sorts to online games and other high quality games. Some phones also include a touch screen.

Generations

Mobile wireless industry has started its technology creation, revolution and evolution since early 1970s. In the past few decades, mobile wireless technologies[5] have experienced 4 or 5 generations of technology revolution and evolution, namely from 1G to 4G.

Table1: Different Types of Mobile Generations

S.No	Generations	Systems	Frequency	Transfer	Speed
1	1G	Analog Cellular Telephony	Low Quality	Analog Voice	low
2	2G	Digital Mobile Communication	High Quality	Digital Voice	28.8kpbs
3	3G	Wideband Mobile Communication	Very High Quality	Digital Voice with data, Multimedia files	100 kpbs
4	4G	Orthogonal Frequency Division Multiplexing (OFDM)	Very High Quality with Speedy Accession	Digital Voice, data and Multimedia	7.2 mbps

Latest Available in Market:

1) Blackberry Pearl 8130 2) Apple iPhone 3) Motorola MOTOKRZR K1 4) Nokia E63 5) Nokia E72 6) Sony Ericsson Naite 7) Samsung Ultra Smart F700 8) HTC S710 9) LG OZ 10) Sprint Instinct and so on.

Mobile optimized library websites

Libraries have been talking about optimizing their web sites for mobile devices for years, but mobile browsers have lagged in their ability to display content and have had limited functionality The evolution of mobile device browsers has benefited from a marked increase in processor power and the increased speed and coverage of wireless network infrastructures. The browser development has also been accelerated by the increased number of web sites being optimized for the mobile users. Megan Fox's who is web and electronic service Librarian at Simmons College explains topic in her site www.web.simmons.edu[6]. which covers many of her presentations on mobile trends and use in libraries and discuss about the various aspects in this regard. She also lists several libraries with mobile optimized sites including:

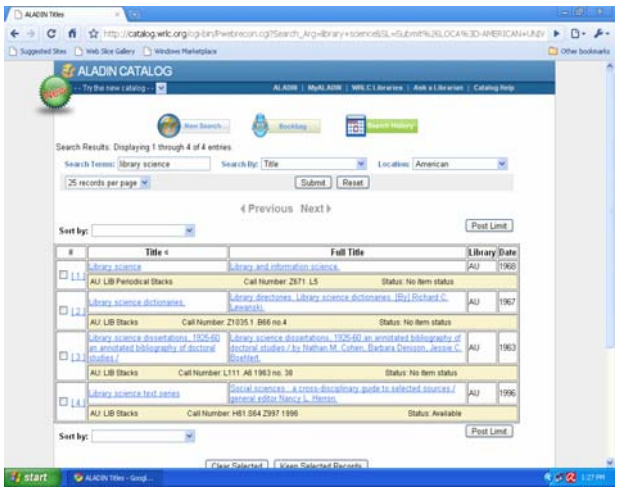
Table2: List of University Libraries with Mobile Optimized Sites

	University	**Sites**
1	American University Library	http://www.library.american.edu/mobile
2	Ball State University Library	http://www.bsu.edu/libraries/mobiles/
3	Boston University Medical Library	http://med-libwww.bu.edu/mobi /index.cfm
4	Cal Poly Pomona University Library	http://www.csupomona.edu/library/mobile
5	Hanover College Duggan Library	http://library.hanover.edu/mobile/mhome.html
6	Harvard College Library	http://hcl.harward.edu/mobile/versions
7	University of Illinois Library	http://hades.grainer.uiuc.edu/nikki/mobile/version1
8	New York University Libraries	http://library.nyu.edu.8000/mobile
9	University of Virgina Library	http://mobile.virginia.edu/library.php
10	Duke Libraries	http://library.duke.edu/mobile/

As a mobile user one can find that how these libraries have maintained their mobile web content. They all generally give the details of library hours, library location, and library services and allow the user to connect with librarian for reference service. The following is the details of contents of one library to better understand the contents of the sites Example: American University Library Catalogue[7].

American University Library – Mobile: OPAC (Online Public Accession Catalogue)

The American University library covers the resources in mobile search facility with various searches. All library e-resources like e-books, e-journals, bibliographical databases are in portable format for mobile users.



The Potential use of Mobile/Handheld devices for Libraries: The following flowchart (Fig1) represents the applications of mobile/Handheld devices for library.

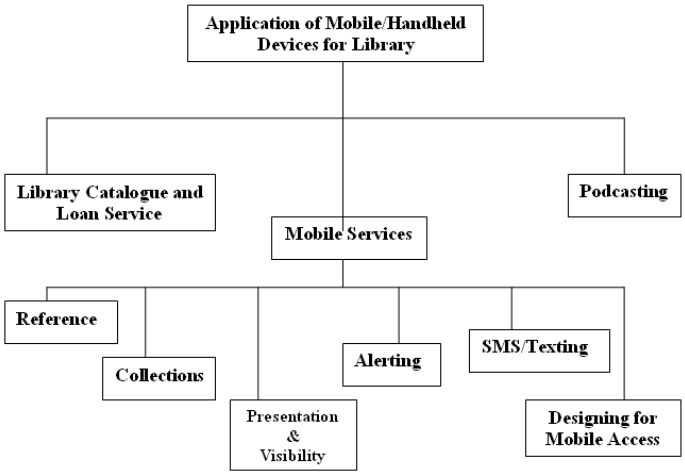


Figure1: Applications of Mobile/Handheld Devices for Library

Mobile Services

We can think of two ways in which a discussion about mobile services is framed. First, how do you 'mobilize' existing services to work better with the variety of network consumption patterns which are emerging? And second, how does this changing network environment restructure some of the ways in which we think about and provide service? I will consider each of these in turn. Here are some of the ways in which we see libraries already adapting with mobile–ready services. Kroski (2008) provides examples of some of these and other services.

a) Reference/enquiry

Libraries are offering services through a range of communication vehicles such as chat, instant messaging, texting, and e–mail. Should the reference desk take phone calls from people in meeting or study space in the library? Data from an ongoing study of Virtual Reference Services indicate that even where people are physically in the library they may prefer to use chat reference than seek out a face–to–face encounter. Again, convenience and workflow integration are important.

b) Collections to go

Audio- and e–books are available in various ways. As discussed already, user lifestyles make these attractive. In some cases, devices are lent to play the material.

c) Presentation and visibility

Videos and pod casts describing or promoting particular library services, covering library events, and so on are becoming more common. Often, these are made available on network level sites — you Tube, iTunes — where they are more visible.

d) Alerting
Really Simple Syndication[8] (RSS) is becoming pervasive. Text message and e–mail alerts are also more common. People may be told about events, about the status of their interactions/requests, and availability of staff.

e) Syndication
Libraries have begun to push applications and content into the diffuse network environment of their users. RSS feeds, widgets, and Face book applications are becoming more common.

f) Mobile sites
Some libraries are specifically designing for mobile access. This imposes an interesting and valuable discipline. The mobile[9] site needs to be much simpler than the typical library site, and it is a useful exercise to think what is best to present there. The 'computers' link lets you know the availability of computers in different areas of the libraries.

g) SMS/Texting
Library's instant Access Google SMS enables you to send queries as text Massage over your mobile phone or device and easily get precise answers to our questions, No Links, No web pages, just text and information in seconds. Merriam Webster[10] (online) is a mobile subscription facility, and just by putting our mobile number we get the word information just by messaging. Library OPAC system is now mobilized by facility of text message to check the availability and other details of books. Publishers are sending extracts from books out via SMS. Websites are now giving the option of sending content to IM addresses and via SMS. Librarians are extending reference services - Altarama in Australia provides a SMS to email to SMS service for librarians/library users. Teleflip and Gizmo SMS are other new services.

h) Multimedia Contents
Net Library audio books of San Francisco public library are now available on mobile device and library of congress audio tour just by calling the number by your cell from any place. The New York public library (E- NYPL) with its multimedia collection is accessible via mobile device. Mobile TV like Mobi TV allows live TV that goes wherever you go and view 25 channels with normal search. Tivo is also now available on mobile devices. YouTube and second life are working on mobile versions. Libraries have produced videos particularly for the mobile screen.

Information - Based Mobile Service Support for Library Information System

An InfoStation-based information system design for the provision of mobile services (mServices) within a Library domain An InfoStation system has previously been proposed to operate across a University Campus[11], providing access to a variety of mobile e-Learning services (mServices), as well as a number of supplementary

communications services[12]. An InfoStation based system facilitates efficient user access to specialised library mServices and resources through mobile devices (Cell Phones, Laptops, and PDAs)

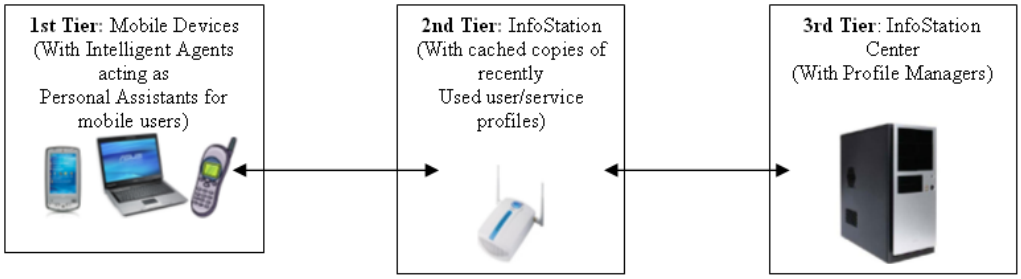


Figure2: Information-Based System Architecture

The proposed InfoStation-based system architecture provides access to library mServices, for mobile users equipped with wireless devices, via InfoStation deployed at key locations within a University Library. The architecture has a 3-tier structure involving the user mobile devices, the InfoStation, and the InfoStation Center (Figure 2). User access to the library mServices is facilitated using available Bluetooth or Wi-Fi connections. The InfoStation-based system is organized in such a way that if an InfoStation cannot fully satisfy the user service request, the request is forwarded to the Info Station Centre.

The first Tier encompasses user mobile devices, equipped with intelligent agents that act as Personal Assistants (PA) to the users. The second Tier consists of the InfoStations, deployed within the University Library facilitating the users with mobile access to the library mServices through wireless connections. The third Tier is the InfoStation Center-the core of the overall architecture. Its main function is controlling the InfoStations as well as updating and synchronization of information across the system.

Library Catalogue and Loans Service

Building on the existing database and cataloguing system, the 'Library Catalogue & Loans' service allows access to the library catalogue for users whilst on the move throughout the library. Users can access up-to-date information as to the availability of the various resources, and monitor the status of resources they may have loaned out from the library. Users may also monitor fines they may incur for failing to return resource before the designated time has passed. To ensure the user is aware of this time constraint, the PA (Personal Assistant - Intelligent Agent) on the user personal device will provide notification the resource in sufficient time to allow the user to return the resource before the deadline passes.

In collaboration with the 'Library Catalogue & Loans' service, the 'Interactive Library Map' service facilitates the quick and efficient location of resources within

the library. Users are provided with specific directions to collocations of materials, most suitable to them (e.g. Science, Engineering, Languages) or indeed to the location of resource which the users may request through the library catalogue. In delivering this service, its content must be adapted and customized to the capabilities of the user device. Whilst utilizing a basic device with limited graphical display capabilities, the service content will be presented will be in a simple format which 'best' suites the device, e.g. textual format. If, however the user is utilizing a multimedia capable device (e.g. a laptop or PDA), s/he may access the complete hyper-media format of the service encompassing interactive graphical representation of the library, audio and indeed textual details of direction to specific research. This adaptation and customization address the need for the system to facilitate a wide verity of devices with varying capabilities, while still delivering the 'best' quality of service (QoS).

When a mobile user enters within the range of a library InfoStation, s/he goes through an Authorization, Authentication and Accounting (AAA) procedure. Once the AAA procedure is complete, the InfoStation analyses the user profile and device capabilities using CC/PP-UAProf. The InfoStation draws together a list of recommended resource, which may be applicable to the user. Details of the location of these resources are provided to the user's PA along with notifications of any outstanding library charges incurred by the user. The PA will maintain the details and location information of the recommended resource in its cache, so if the user requests them, the information can be displayed immediately in the most convenient format. If the user chooses to access the library catalogue service, s/he may specify a number of search criteria such as title, author, or collection to search (Main catalogue, Journals special collections etc). Utilizing these criteria, the InfoStation shifts through the library database for material which 'best' matches the user's search. Once a resource is chosen InfoStation provides resource location information, again drawing on the 'Interactive Library Map' service to direct the user.

Podcasting

Mobile/Handheld devices such as iPod, PDAs, mobile phones, and audio material such as podcasts can be used for various subjects in Higher Education including: Foreign Languages, Arts, Music & Dance, Writing, Philosophy, History, Politics, Cultural Studies, Education, Sociology, Psychology, Health, Medical, Biology, Environmental Science, Engineering, Computing Science, Information Technology, and etc.

Advantages of Podcasting Lecturers

Lecturers can offer both streaming & Podcasting lectures[13] (Purdue University). This function can be used to all subjects. The advantages are:

- Students repeat the lectures anytime, anywhere
- Non-native English speaking students repeat the lectures
- Students who were severely dyslexic, or having visual or hearing impairments
- Students review the lectures before exams
- Students listen to the lectures they have missed

- Students ruminate, and listen again to lectures and tutorials as a way of encouraging critical, analytical approaches
- Instructors listen to their own lectures to improve their presentations

Provide lecture materials in a different format

Mobile devices can be used to access reference materials copied from lectures. These materials format existing content in a way which is consistent with its original design but is accessible on a mobile device.

Table3: Various Universities provide collection of podcasts on various topics related to different subject data represented in following table.

S.No	University	Materials
1.	University of Wales, Aberystwyth	First University in U.K to offer Podcasts to provide course lectures.
2.	Duke University	Text Book, Journals, Music, Vocabulary, Novels, Stories, Poem. Oral Interviews, Authentic Speeches by notable figure, debates, listening materials for foreign language
3.	University of Western Australia	Communication Studies.
4.	Georgia College and State University (GCSU)	Audio content on web, subscribed podcasts, preloaded language tutorials, recordings of diction sessions with native speakers, audio books, literatures, audio materials, psychology history, sociology.
5.	University of Mary Washington	Poems and foreign languages
6.	University of Missoury	Teacher notes, meeting and conference with students, student oral report, student project support interviews for different subjects.
7.	Stanford University	Provide faculty lectures via Podcasting.

Access multimedia materials

With video enhanced iPod, students can access a visual glossary of human neuroanatomy. This glossary comprises of 500 structures and terms. For each term, students can access a description of the term, information on brain structure, location and function, audio pronunciation, links to related terms and high quality brain imagines optimized for the iPod photo display[14] (Duke University, Psychology).

With video enhanced iPod, students can access a visual glossary of the human brain and spinal cord. This resource contains information on more than 400 neuroanatomical structures and terms. Students use it for specific assignments and to

facilitate the learning of human central nervous system anatomy. Students can also watch a brain dissection video via iPod[15] (GCSU, Psychology).

Mobile devices can provide students with a series of interactive exercises based entirely around question and answer activities with supporting information and images (MOBIlearn, First Aider in Health), and also provide users with different sets of information for different locations by using rich media (MOBIlearn, Multimedia Museum).

Handheld devices such as PDAs allow Healthcare students to access a wide range of multimedia resources related to clinical information and tools e.g. administrative functions (scheduling, address book…), electronic textbooks, prescription information, medical calculators, photography, memo, medical records, patient tracking, etc. and learning activities and tools e.g. access Internet, dictation, evidence-based[16] medicine tools, in-house documentation system, etc. (Healthcare in Community).

PDAs allow students to access course syllabus, online grade books (post student grade), personal profile (store information to share with others), team space (facilitate the collaborations among team members), video classroom (watch lectures live), etc. (Indiana University).

Library Vs Mobile Technology

Mobile technology has now come up with "Libraries in Hand" trend. Our librarians are in move to determine how these devices of affecting information access and ensure that they are communicating with patrons and providing web content in the most appropriate and effective ways. Our Librarians most be prepared to take this challenge and put their efforts to increase the market and information anytime, anywhere on one's own handheld device.

Since mobile handed devices truly are personal device, search histories physical locations can be harnessed to produce more accurate, individualized information and services. Users on the go don't want to wait for list of web results, they want answers to their question at once thus find mobile search different from regular web search. More and more library user are using their cell phones or other mobile devices (e.g., PDAs, smart phones, etc.) for much more than talking and texting. Many patrons are searching and browsing the web, reading magazines and books, and generally doing things that recently used to do by computers.

Libraries today are covering most of the technology given by mobile industry like PDA's. Blackberry, iPod, Cell phones, UM PC's (Ultra mobile PC) and mobilizing library contents in a portable form suitable for small screen and delivering short services in the form of contents/ information with device's multiple searching features. As not all content is optimized for the mobile network, so the Transcoded web is developing to transcribe content to fit into a mobile device. It's not perfect and some content is lost, but it's happening. There is mobile.licio.us, mobile blogger[17] and a mobile My Space version.

Librarians will need to become proficient in using these devices to enable users to access them anywhere from anyplace. Sirsi announced a product called PocketCirc-software that runs on a PDA that allows library staff to perform circulation tasks in

any part of the library with wireless connectivity. I think that libraries will benefit from this type of flexibility with a handheld PDA device in a windows CE environment sirsi pockcir combines the power of sirsi Unicom Library management system with the flexibility and ease of PDA to offer you all the benefits of wireless technology. The addition of circulation information and book locations in the library take advantage of the mobility of the device and add another degree of self-sufficiency to the transaction. Libraries may want to consider providing access to circulation records, book due dates, overdue notices, and ILL requests via cell phones and handhelds to better serve their mobile patrons. Its definitely seems a boon to the staff as free them to serve user and perform both online and offline circulation operation without having to be on the desktop workstation.

Conclusion

More and more changes are expected within four to five years in the field of mobile technology and its application to the libraries, the day is not far when we will use phone to read barcodes or RFIDs in the library and OPACs will develop GIS sensitivity and be able to communicate with users through their mobiles for holds, fines, late notices, alerts, etc. Even though mobile communication technologies have created an immense impact on the digital community, it has not been widely used with regard to educational purpose. There prevails lack of awareness and certain limitations on use of mobile services to library among Indian Universities. Mobile communication should be implemented in all Indian Universities and its uses should be explored widely in academic libraries. The librarian has to understand fully the capabilities and potentials of the mobile technology and its use in libraries in near future by providing the quality based services matching with the needs of the user.

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