**APPLICATION OF MOBILE TECHNOLOGIES IN LIBRARIES**

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**ABSTRACT**

The passion for mobiles by common man has thrown ample opportunities for libraries to create mobile-friendly library and information services. The survey finds out the commonly used mobile devices among students, their purpose of use and purpose of using internet. The paper also seeks their opinion about library and information services, if provided through mobile technologies, and kinds of services, which could be provided. The findings of this survey show the positive attitude of the students of KLE Society’s J.T.College, Gadag towards the provision of library and information services on mobile devices. This study also indicates requirements, advantages and disadvantages of mobile application in libraries.

***Key words:***

**Introduction**

The wireless technology and mobile phones are becoming an integral part of everyday life and are changing the way one connects and interacts with the world. Mobile phones have wide variety of applications. Already mobile devices have made significant impact on banking, tourism (Web GIS), and health services. Mobile computing is transforming how people search, receive and interact with information on a daily basis. In just a few short years Smartphone ownership has skyrocketed and popular use of e-readers has been steadily on the rise. These advanced mobile tools provide portable, instantaneous access to the world of information, across boundaries of subject, discipline and industry. To benchmark its place as an information provider, libraries must not hesitate to adopt all possible new technologies like ICT, Wi-Fi, mobile communications, and Library 2.0 and 3.0 to redesign, and transform its services so as to deliver information and its services to the more demanding users whenever, wherever and however they prefer. Libraries are fully engaged in the process of adapting to increased demand for electronic collections and the ongoing acquisition and archiving of born- digital content.

 The libraries need to switch over from ‘physical places’ to ‘virtual places’ to embrace and serve ‘net gens’ and ‘digital natives’ who prefer their libraries to be where they are and prefer to access and share information from anywhere at any time. There are wide range of mobile computing platforms in the market from smart phones to multimedia phones with different types, styles, models, and with many inbuilt features and capabilities like cameras, touch screens, bar code scanning, Wi-Fi, Bluetooth, instant messaging, GIS/GPS, RFID, operating systems, varying additional storage space, etc. Revolutionary i-Phones and smart phones (3G and 4G phones) can be used to run many software applications including internet access with faster connection, speeds. Availability of automatic configuration of GPRS-enabled mobile phones, which help the subscribers to be online with few clicks. Emerging technologies like speech technology in mobile phones has enabled disabled persons to use mobiles effectively.

These smart phones are becoming increasingly ubiquitous to make the dream of ‘pervasive library’ a reality. The mobile phones with operating systems, capability to scan barcodes, text recognition may help libraries to interface with other applications to introduce users to online library transactions, database querying, relevant full-text information download and interactive sessions.

**Library and information services through mobile devices**

In view of the capabilities and developments in mobile technologies and their advantages enumerated in the study, libraries can design and provide the following specific services on mobile devices, compliance with the information security policies and standards of the parent organisation.

**Sms/Texting (Alert Services)**

Existing e-mail alert services like bringing new books to the notice of users for suggestion, intimation of arrival of indented documents by users, informing availability of reserved documents for collection, appraising about which/when books are overdue, library circulars, e-journals subscribed, change in timings, information about important events, etc., can be upgraded by sending through SMS/textalert services3 to meet the information needs of ‘netgens’. Such alert notifications can be generated automatically using integrated library management system/software. SMS messages can be sent to group of users simultaneously through many free applications, and intermediary websites/clients.

**Formal Education, Distance Learning And E-Learning**

Students are very versatile in using their mobile phones and various mobile applications. Academic libraries can harness the advantage to lead implementation of library services through mobile devices to support distance learning, formal education, and research activities in e-learning environment by making the information resources ubiquitous. Libraries should redesign their services keeping social networking sites in mind, which are heavily used by younger generation for interaction, communication, and information sharing. Library services should also blend with teaching and research practice of colleges/universities, scientific community or other patrons whom they serve.

**Instant Messaging For Reference Services**

The reference and referral services have already become virtual with ICT applications and internet. The mobile devices can further appreciate the service with instant answers like definitions, meanings and other information from digital libraries and web. If the organisation has its own secure and private enterprise IM network, libraries may as well make use of these as they are more reliable and secure; or else use web-based free instant messaging services from Google, America Online, Way2SMS, etc., as an intermediary to have interactive sessions with users to answer ‘reference queries’. As these free messaging services can be withdrawn anytime by the providers, libraries’ may subscribe to fee-based tools like Text a Librarian, Libraryh3lp, MyInfoquest, and Shoutbomb. These tools offer mobile customers all of the benefits of virtual reference services without being tied to a website. Librarians can provide instant answers, and links to articles/references in real time.

**Mobile Optimised Library Webpages**

With the increased use of Internet through mobile, libraries are required to redesign their web pages as mobile optimised interactive and participative library web pages to provide dynamic information services to users on a 24X7 basis via mobile devices. While redesigning library must take into consideration the basic models of mobile phones to the smart phones with greater capabilities and functionalities as some of the iPhones and smart phones are compatible to access the web pages designed for larger screens. But the time taken to access is more and downloading is very slow and expensive. To overcome these difficulties, it is necessary to make mobile-friendly websites by using (cascading style sheets) CSS or auto-detect and reformat (ADR) software, which allows a website to rearrange its content and navigation to suit the size of the screen it is being viewed on. Libraries should be aware of mobile web browsers, screen resolutions and size, etc., while creating webpages. The website must be redesigned to have less graphics, so that the page loads much faster and with minimal keyboard operations, to ease the mobile user. In this context, text-only websites are easier and faster to navigate and fabricate into new applications.

**Library Instructions And Virtual Tours**

Library tours, instruction/induction/orientation programs have been quite significant in bringing the nonusers to libraries and also help the remotely located or users located in different geographical locations. Library users, who don’t have time or inclination to attend an on-site workshop, can get access to library tours on their mobile devices. Audio/ virtual library tours can be produced fairly quickly, inexpensively, and could reduce the amount of staff time spent helping new users to orient themselves in the library and explaining the facilities available. It can easily be provided both as downloads from the library website and on mobile devices.

**Mobile-Based Library Lending Service**

As in banking and financial sectors, libraries can formulate regulations for using mobiles for circulation of reading materials and maintenance of users account. The wireless solution enables staff to assist patrons in the stacks, checkout materials while off site, such as at community or campus events, and update inventory items while walking around the library. Mobile phones make ILL/document delivery services faster and cut-down the time to request/visit different libraries and complement the geographically remote users.For that SirsiDynix a foreign company has introduced an app called ‘PocketCirc’ which performs the above mentioned functions.

**Online Library Catalogs on Mobile Phones**

Libraries are required to interact with the software vendors to create mobile compatible WebOPACs. For example, AirPac add-on product will auto detect the type of device you are using and format accordingly the catalogs without graphics for better viewing. libSirsi-Dynix, Innovative and LibraryAnywhere developed by Library Thing have similar options. OCLC’s WorldCat Mobile application pilot allows users to search for and find books and other materials available in their local libraries through a web application they can access from a PDA or a smart phone. To provide location-based services, libraries have to use mobile telecommunication system, the internet/web-based OPAC on intranet and geographic system like GPS. Many phones have built-in GPS, which allow users to navigate to locations and, if activated, allow others to find them. OCLC’s Worldcat mobile application for iphones makes use of this feature when identifying local libraries. Libraries with multiple branches like public libraries can capitalise on the GPS function to create custom maps and navigational tools to branch locations.

**QR Codes on Mobiles**

QR code stands for ‘quick response’, and basically a two-dimensional bar codes that can contain any alphanumeric text and often used to store urls, text, etc., known as ‘mobile tagging’. QR codes are used in commercial tracking, logistics, inventory control, and advertising. Data can be translated into a QR code by any QR generator, many of which are available as free download. Users simply enter the data to be translated, and the generator produces the code, which can then be displayed electronically or in printed format. Decoding the information can be done with any mobile camera phone that has a QR reader, which is freely available online for most devices.

Libraries can use QR codes to label books, journals, audio/visual, offprints, add QR codes in WebOPAC and other places. Users with phones that have a camera and free barcode decoder software can take a picture of the barcode, then the software decodes the picture, and translates the data into title, barcode, and location information that can be displayed on the phone. The QR code can be scanned, and saved for further use on mobile. QR codes not only link to websites, but also can be used to send prewritten SMS to phones, transfer phone numbers, and provide further text. They are designed to cope with a high-level of error, hence are suitable for outdoor use.

**Requirements for implementing mobile based library services**

* It is necessary to have a carefully planned requirement study to know the practical situation like, the kind of services to be provided on mobile devices and type of devices to be used.
* Library need to acquire the required hardware and software after market survey.
* Library must provide physical and virtual environment for using mobile devices and accessories.
* One needs to ensure that the customers having mobile phones of different network operators are in a position to avail the services.
* It is a prerequisite to optimise library OPAC, website, and databases for mobile devices and introduce new services wherever possible.
* Security and authentication is a matter of concern in mobile services particularly due to availability of web contents on a 24x7 basis to prevent damage or loss to the data.
* Librarians should acquire and apply necessary skills if they wish to provide mobile-based services.

**Advantages of mobile based library services**

* USER-FRIENDLY AID- Familiarity with their own devices and technology helps the users in accessing information quickly and does not require orientation and training. Mobile users are using the facilities on mobile phones like SMS, instant messaging, web browsing, e-mail effortlessly to communicate. Most of the features are pre-installed on mobile devices or option for data plan packages.
* PERSONALISED SERVICE -Personalised service helps users to interact with library staff to seek specific information or reference away from library.
* ABILITY TO ACCESS INFORMATION- Information access from anywhere at anytime will be of great help for users who cannot visit library in person and provides a constant link to required information resources.
* TIME SAVING- Users need not record information about resources while browsing and searching library resources or wait at library transaction counter to renew/reserve books and hence the time of the user is saved.
* USER PARTICIPATION- Libraries can enrich OPAC by allowing users to incorporate user created content like notes or images uploaded by users.
* LOCATION AWARENESS-Mobile communication enables libraries to offer location-based services/content through global positioning system (GPS) capabilities. Libraries can guide the users to the location of specific document or service through maps and navigational tools.
* LIMITLESS ACCESS -All online resources accessible on their desktop also become accessible through mobiles.

**Disadvantages of mobile based library services**

* SLOW CONNECTIVITY-As mobile phones depends upon the network or service provider a lot,any errors ,changes etc to the network will reflect in the coverage of a mobile device .Slow loading is one of the common drawbacks found on mobiles.
* MOBILE ILLITERACY-Only people who are acquainted or with technological backgrounds find this useful.For the rest its still a big task.
* COSTLY-Mobile based services like mobile web pages, mobile applications are very costly .
* RESTRICTIONS-In certain instituitions like schools ,colleges and other high security offices there are restrictions over the use of mobile phones.So this is a very important constrain mainly in Indian context.

**Objectives of the study**

1. To understand use and purpose of internet and mobile technology by students
2. To analyse what all technologies can be useful for libraries and information centres.
3. To know how effectively this technologies can be adopted.
4. To find its advantages and disadvantages.

**Methodology**

Descriptive method, observation method and questionnaire methods are using for the study of application of mobile technologies in libraries. Questionnaire was distributed to randomly selected 200 students of KLE Society’s J.T.College, Gadag who are frequently visit library to know the use and purpose of using mobile technologies and internet. Out of 200 questionnare distributed 168 questionnare were received. Observation of data available in various journals , documents and websites about the application of mobile technology in libraries , globally is done .The data gathered are then organized ,analysed and used to find out the technology’s application and drawbacks ,if any , and then reach valid conclusions.

**Analysis and interpretation**

**Use of Mobile phone**

Respondents were asked to indicate their use of Mobile phones

 Table 1

 *Use of Mobile phone*

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No** | **Parameters** | **No. of Respondents** | **Percentage of Respondents** |
| 1 | Yes | 168 | 100% |
| 2 | No | 0 | 0 |

The data shown in table 5.27 reveals that all the students 100% use Mobile phone.

**Type of Using Internet**

The students were asked to indicate which type mobile phone they using.

 Table 2

 *Type of Using Mobile phone*

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.** **No** | **Period** | **No. of Respondents** | **Percentage of Respondents** |
| 1 | i-phone | 0 | 0 |
| 2 | Apple | 0 | 0 |
| 3 | Tab | 9 | 5.36% |
| 4 | Mobile phone | 35 | 20.83% |
| 5 | Smart Phone | 124 | 73.81% |
| **Total** | **168** | **100%** |

As indicated in Table 5.28 majority of the students 73.81% use smart phone , few students 20.83% use simple mobile phone, only 5.36% of the students use tab.

**Use of Mobile Services**

Respondents were asked to indicate their use of Internet service

Table 3

 *Use of Mobile Services*

|  |  |
| --- | --- |
| **Name of services** | **Order of Preference** |
| **Number of Respondents and Preference** |
| **1** | **2** | **3** | **4** | **5** | **6** | **Total** |
| Whatsapp/social network | 63 | 56 | 32 | 12 | 5 | 0 | 168 |
| 37.50% | 33.33% | 19.05% | 7.14% | 2.98% | 0.00% | 100.00% |
| SMS/chatting | 38 | 21 | 48 | 20 | 23 | 18 | 168 |
| 22.62% | 12.50% | 28.57% | 11.90% | 13.69% | 10.71% | 100.00% |
| Using internet | 61 | 72 | 4 | 21 | 10 | 0 | 168 |
|   | 36.31% | 42.86% | 2.38% | 12.50% | 5.95% | 0.00% | 100.00% |
| Watching movie | 0 | 10 | 19 | 6 | 51 | 82 | 168 |
|   | 0.00% | 5.95% | 11.31% | 3.57% | 30.36% | 48.81% | 100.00% |
| Communication/video calling | 6 | 9 | 14 | 79 | 35 | 25 | 168 |
| 3.57% | 5.36% | 8.33% | 47.02% | 20.83% | 14.88% | 100.00% |
| Playing Games | 0 | 0 | 51 | 30 | 44 | 43 | 168 |
| 0.00% | 0.00% | 30.36% | 17.86% | 26.19% | 25.60% | 100.00% |
| Total | 168 | 168 | 168 | 168 | 168 | 168 |   |
| 100% | 100% | 100% | 100% | 100% | 100% |   |

37.5% students give first preference to Watsapp/social network sites. 36.31% students are using mobile phone for using internet. 42.86% students give second preference to use internet and 33.33% students give second preference to the social networking sites.

**Purpose of using internet**

The students were asked to indicate their purpose of using internet

Table 4

 *Purpose of using internet*

|  |  |  |
| --- | --- | --- |
| **Sl.****No** | **Purpose** | **Order of Preference** |
| **Number of respondents and Percentage** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 1 | For updating knowledge | 38(22.62%) | 52(30.95%) | 20(11.90%) | 21(12.5%) | 16(9.52%) | 12(7.14%) | 9(5.36%) |
| 2 | For preparing assignments | 76(45.24%) | 43(25.595%) | 24(14.29%) | 17(10.12%) | 6(3.57%) | 2(1.19%) | 0 |
| 3 | For Communication | 4(2.38%) | 5(2.98%) | 14(8.33%) | 12(7.14%) | 24(14.29%) | 51(30.36%) | 58(34.52%) |
| 4 | For Research Project | 17(10.12%) | 14(8.33%) | 20(11.90%) | 32(19.05%) | 48(28.57%) | 25(14.88%) | 22(13.1%) |
| 5 | For Entertainment | 21(12.5%) | 15(8.93%) | 18(10.71%) | 31(18.45%) | 29(17.26%) | 33(19.64%) | 27(16.07%) |
| 6 | For Career development | 12(7.14) | 15(8.93%) | 14(8.33%) | 26(15.48%) | 43(25.59%) | 37(22.02%) | 11(6.55%) |
| 7 | For Specific subject information | 34(20.24%) | 48(28.57) | 43(25.59%) | 19(11.30%) | 11(6.55%) | 8(4.76%) | 5(2.98%) |

Table 4 explains that

**First preference**

When 45.24% of the students use internet For Preparing assignments, followed by Updating knowledge 22.62%, 20.24% use it for Specific subject information and 12.5% of the students use internet For Entertainment. When 10.12% use internet For Research project, 7.14% of the students use internet for career development only 2.38% use internet for communication.

**Second Preference**

The purposes of using internet for students are updating knowledge 30.95%, Specific subject information 28.57%, preparing assignments 25.59%. For entertainment and career development 8.93% and 8.33% also use internet use for research project only 2.98% use internet for communication.

**Third preference**

When 25.59% of the students use internet for the purpose of Specific subject information followed by preparing assignments, 14.29%, updating knowledge and research project 11.90%. When 10.71% use internet for entertainment, 8.33% use internet for career development and communication.

**Forth preference**

When 19.05% use internet for the purpose of research project, 18.45% use internet for entertainment. 15.48% use internet for career development, 12.5% of the students use internet for updating knowledge. When 11.30% use internet for specific subject information and 10.12% use internet for preparing assignments only 7.14% use internet for communication.

**Fifth preference**

When 28.57% use internet for research project, 25.59% use internet for career development. 17.26% use internet for entertainment .When 14.29% use internet for communication 9.52% use internet for updating knowledge whereas 6.55% use internet for specific subject information only 3.57% of the students give fifth preference for preparing assignments.

**Sixth preference**

When 30.36% use internet for communication 22.02% prefer internet for career development followed by for entertainment 19.64%, for research project 14.88%. When 7.14% use internet for updating knowledge 4.76% use internet for specific subject information only 1.19% prefer internet for preparing assignments.

**Seventh preference**

When 34.52% of the students use internet for communication 16.07 prefer internet for entertainment. 13.1% prefer internet for research project. When 6.55% use internet for career development 5.36% use internet for updating knowledge only 2.98% of the students give preference to use internet for specific subject information.

**Library service preferred using Mobile technology**

The students were asked to indicate whether they agree to using mobile technology in libraries

Table 5

*Preferred library service using Mobile technology*

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Methods of learning** | **No of Respondents** | **Percentage Of Respondents** |
| 1 | SMS/e-Mail alert service | 62 | 36.90% |
| 2 | m-learning | 78 | 46.43% |
| 3 | Virtual Referal service | 25 | 14.88% |
| 4 | Inter library Loan Service | 3 | 1.79% |

It is evident from Table 5 that majority of the students 46.43% prefer m-learning through library service, followed by 36.90%, prefer SMS/e-mail service for instant knowledge about the library arrivals, their account details etc and 14.88% prefer virtual referral service and 1.79%.

**Suggestions**

In the light of the study it suggest that libraries should evolve on the basis of technological assistance required by the users and at present mobile based services are at its peak point. In order to move along with the time and technology all libraries should take initiatives in adapting mobile technologies.

* SMS services can be a first step when adapting mobile based services,it will later motivate to incorporate other mobile services in future.
* With the help of some experienced personals a basic mobile websites can be created without much of a cost.
* Take initiatives only after analysing what all gadgets are used by the users and what are their requirements.
* Libraries which adapt mobile based library services should promote the use of mobiles among other institutions also.

**Conclusion**

ICT is an essential component in everyday learning. The potential of Mobile phones are immense, most of them are not made utilised by the mobile phone users. The users are less interested in making this capacity of mobile phones useful in the field of data or information gathering. This situation can be changed and the mobile phones will provide better performance rather than any other conventional equipments and practices. Library policies and services should be flexible and open so that new information needs of users in pursuit of organisational needs are met with new technologies. The task of libraries is to exploit new technology in a more effective way to promote and integrate them into the design of future library services in a cost efficient manner. It is very essential for libraries to be dynamic and change their outlook to adopt new technologies and to develop new kind of relationships with users.

In this study it is evident that most of the mobile applications, modern technologies can be used for the better running of libraries. It is also possible to develop an m-library presence with relatively little effort. Libraries need to be indispensable to their users ,and to this end they have to include mobile devices as part of their strategic thinking .Libraries have to grow ,and this requires greater collaboration between academic ,industry, corporations and government. In the current scenario, mobile libraries have the potential to proliferate and we will witness a situation in which the mobile will definitely be used as a tool to spread learning across the world.

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