ACADEMIC LIBRARY SERVICES IN THE TIME OF COVID-19 THROUGH MOBILE TECHNOLOGY: A DESCRIPTIVE STUDY

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ABSTRACT

Due to the spread of COVID-19 corona viruses the physical access of all the libraries has been stopped. All the users of the Academic libraries bound to stay home. Their educational and research activities hampered very much as not getting resources from their institutional libraries. It is obvious as mostly the academic libraries are not digital or electronic in nature.Society may be on the verge of a revolutionary phase of mobile device use in higher education generally and in libraries in particular. Digital Technology has provided faster access to information and it is also challenging the libraries to rethink and remodel their services by adopting the technological changes. Today mobile phones are becoming an integral part of everyday life and are changing the way one connects and interacts with the world. In this pandemic situation and changing scenario,Mobile Technology will be of great help to libraries towards strengthening their relationship and providing enhanced user-oriented services to existing users. Libraries may well reach out to the remote users who were considered unlikely to connect because of absence of a medium. The paper discusses on the need, advantages, drawbacks, barriers and solutions for propitious implementation of the mobile technology in academic libraries in this pandemic time. It also explores the type of infrastructure required by the libraries for providing these services in libraries.

KEYWORDS : *Mobile technology-based Library, Mobile Technology, Virtual access Library, Mobile document supply, e-resources, Covid-19*

1. INTRODUCTION

The COVID-19 pandemic has forced governments worldwide to place their countries in full or partial lockdown to contain the spread of the virus. However, these lockdowns came with severe economic and social consequences, which has also presented unique challenges in the educational sector and has forced not just students but also policy makers and service providers including the librarians to adapt and adopt technology as a viable and valuable option to ensure fulfilment of the educational needs of the stakeholders and in overcoming various hurdles in this pandemic time. In the past few decades, some technological changes have appeared gradually and their impact on higher education has been incremental. In other cases, over relatively short periods of time, technological changes, such as the introduction of Web browsers, have had a major, and some would say revolutionary, impact on higher education as well as the broader society. Which will it be for mobile devices? Will their impact be gradual and incremental or sudden and revolutionary? There is a case for both points of view. Since individuals have been using devices such as laptops and mobile phones for

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decades, one might argue that the impact of the use of mobile devices on peoples' behaviour in general and on higher education in particular has been relatively gradual.On the other hand, as devices with compelling new features emerge and wireless connectivity is almost ubiquitously available, we may be on the verge of a revolutionary phase of mobile device impact on higher education and libraries.

Mobile technology has made communication and information access very convenient and timelyto users from the comfort of their own homes and offices, and from wherever they are while onthe move with their cellular phone units or PDAs (personal digital assistants). As today's cellular phones have more features and capabilities than ever before, including mp3players, picture messaging, streaming video, and. become more data-capable, fewer people needa computer to collect information. People use a cell phone as their primary interface for surfingthe Web, listening to music, watching television, reading books, and interacting with friends. Soover the past ten years, the mobile phone has become one of the major interfaces people use toaccess and share information.

Libraries are social institutions, connecting people with people and people with information.They are increasingly no longer just physical places. As most library users owning a mobilephone, and increasing numbers of these being smart phones, it is time for libraries to takeadvantage of mobile technology. Mobile Technology will help both novice and experiencedlibrarians to stay relevant in an increasingly mobile society. They need to be aware oftechnological changes, peer forward, and prepare for the future of library mobile interaction.

Librarians must be commensurate with this trend and integrate themselves into the mobile realm if they wish to deliver enhanced user services.Mobile devices and services offer tremendous flexibility for those who want to take advantage oflibrary services. With a simple 3G connection, a user lying on a beach can access e-books andmultimedia content from a local library. Smart phones can access networks and content can becontinually streamed over a network, providing content on demand and making it unnecessary tomaintain a paper copy of the material. Google is developing for mobile first and the desktopsecond. Apple is in the midst of making its desktop computers behave more like its mobiledevices. Aside from offering convenience, mobile technologies present new opportunities forLibraries to promote access and expand reach.

Having traditionally served as central locations wherein the collection, dispersion, and constant recycling of information in both physical and digital formats occur, libraries have created an economic system of cyclical longevity and sustainability by frequently borrowing instead of constantly buying information materials, just as the era of digital and technological revolutions has made a significant impact on the mission and methods of libraries, this new era is seriously challenging the sustainable growth of libraries. Books and journal articles are no longer simply checked out, read, and returned. Now, multiple users can download, print, and keep the same information on multiple occasions. It is no longer enough for libraries to have print collection; instead, the expansion, creation, and preservation of collections and services have taken on new meanings with mobile devices.

2. Objectives of the Study
The present study is undertaken the following objectives-
- To be familiar with the concept, issues and identify the facilities offered by the Mobile technology based AcademicLibrary.
- To know the advantages provided by mobile devices for Library Services in the Pandemic Situation.
- To identify the barriers or limitations of Library services through Mobile Technology based Devices.
- To find out possible solutions to overcome hindrances or barriers

3. Review of Literatures
Keren Mills (2009) published the research report "M-Libraries: Information use on the move". This research involved an online survey questionnaire of students and faculty at both the UK Cambridge and Open Universities. He found that respondents felt would be most useful to access using a mobile phone: Open hours, Location map, Contact information, Library catalogue (OPAC), Borrowing record. CARL (2009) published Char Booth's research report "Informing innovation: tracking student interest

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in emerging library technologies at Ohio University, 2009." Research conclusion reached was that "library tools such as texting, mobile browsing, and web calling were perceived as very usable in a library service setting by a smaller proportion of respondents, and potentially usable by a larger proportion of respondents. ECAR (2008) Study of Undergraduate Students and Information Technology examined the "technology behaviours, preferences, and attitudes of higher education's undergraduates" and was found that two-thirds of students who responded owned an "internet-capable cell phone", although only 30.8% reported using it to access the Internet. The chief reason reported for not doing so was cost. Todd (2008) research study "Handheld Librarians: A Survey of Librarian and Library Patron Use of Wireless Handheld Devices" for Collection development at Bradley University. This paper results that librarian rather than patrons had of the need for wireless device access. Ryerson University Library Another studied (2008). They conducted a survey of library patrons' cell phone/mobile device usage. They found that of the eleven library services listed in the survey, there were six services that more than 50% of respondents indicated that they would likely utilize via their mobile phones. Karim, Darus& Hussin (2006) published a refereed research paper, survey to examine the "perceptions and nature of wireless phone use" of students at two Malaysian universities. Although this research was conducted a number of years ago, the results are still relevant in gaining an understanding of which library services students will likely want to use. Latour (2005) talks about the complexity of this process as being tied to the negotiation and production of knowledge. He studied that the intricate mobile devices providing access to complex, time-consuming and dense clinical digital resources are not used in daily decision making. Similarly, the simplistic mobile devices alerting clinicians as to when they should wash their hands have received negative uptake responses.

4. Methodology
Present study based on descriptive and observational method. Study conducted based on documents available in printed as well as e-documents related to the topic. Some observation and sharing of knowledge with experienced people of this field are also done.

5. Library Servicesthatcanbe providedto patronsviaMobile Technologyare:
5.1 SMS notification services
Libraries may provide the alerts on latest news, events and notices via SMS and MMS to userswherever they might be go. The users can get notified instantly with notice alerts such as- alertson bringing new books to the notice of users for suggestion, intimation of arrival of indenteddocuments by users, informing availability of reserved documents for collection, appraisingabout overdue books, outstanding fines, reminders to return library items, renew books, librarycirculars, e-journals subscribed, change in timings, information about important events, loanrequest etc.
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 freeapplications, and intermediary websites/clients.

5.2 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 throughmobile devices to support distance learning, formal education, and research activities in e-learningenvironment by making the information resources ubiquitous. Library services shouldalso blend with teaching and research practice of colleges/universities, scientific community orother patrons whom they serve.

5.3 Database Browsing
Libraries provide access to a variety of its resources and databases. The users can just entersearch terms and see results that are designed specifically for mobile viewing. This serviceincludes OPAC (online public access catalogue), integrated search, and original documentsearch.

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OCLC's WorldCat Mobile application pilot allows users to search for and find books andother materials available in their local libraries through a web application they can access from aPDA or a smart phone.

5.4 My library
My library is a personal library space where users can find information and resources of theirchoosing. Users can read alerts, check records, renew resources, request items, trackinterlibraryloans and document delivery requests, set up email notices of new books and journal articles, setup preferences for catalogue searching, etc.

5.5 E-resources with Mobile Interfaces
Some publishers are already delivering e-books (both text and audio) that are accessible viamobile phones. It offers access to a variety of databases and digital resources such as e-Books, e-Journals, Web databases, dissertations, audio books, streaming music, films, images and articledatabases which can be used on mobile. These collections can either be downloaded from thelibrary websites on user's own mobile devices or libraries lend mobile devices with thecollections already on them. A large collection of audio books both free-and subscription-basedservices are available for download and also transferable to mobile devices.Libraries can make use of multimedia messaging service (MMS) on mobile devices to sharephotos, videos, and audio. Most of the e-book publishers provide 24x7 access to the librarysubscriptions from any internet terminal within the campus, as well on mobile devices, such asiPads, Android devices, and Kindle.

5.6 Library guide
Libraries can give users the best of library guide information such as library use guide, questionanswering service, and library statistics delivering rich content in a way that works best for users.If users have questions and want to contact the librarian for help, they can get a fast responsefrom the library via the mobile device and find the appropriate information needed.

5.7 Mobile document supply
The mobile environment and technology present new opportunities for sending documentrequests and scanned images and monitoring the use of collections as well as the automation ofadministrative operations. It can support electronic funds transfer, supply chain management, e-marketing,online marketing, online transaction processing, electronic data interchange, andautomated inventory management systems.

5.8 Text reference service
If the library receives a high volume of enquiries that require brief responses, such as dictionary definitions, facts or service information then Librarians can provide instant answers, and links toarticles/references in real time.

5.9 Library Virtual/ Audio Tours
Library Virtual/ Audio tours, instruction/induction/orientation programs have been quitesignificant in bringing the nonusers to libraries and also help the remotely located or userslocated in different geographical locations. Library users, who don't have time or inclination toattend an on-site workshop, can get access to library tours on their mobile devices. Audio/ virtuallibrary tours can be produced fairly quickly, inexpensively, and could reduce the amount of stafftime spent helping new users to orient themselves in the library and explaining the facilitiesavailable. It can easily be provided both as downloads from the library website and on mobiledevices.

5.10 QR Codes on Mobiles
QR code stands for 'quick response', and basically two-dimensional bar codes that can containany alphanumeric text and often used to store urls, text, etc., known as 'mobile tagging'.Data can

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be translated into a QR code by any QR generator, many of which are available as freedownload. 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 bedone with any mobile camera phone that has a QR reader, which is freely available online formost devices.

6. Mobile devices used in Libraries:
- PDAs (Personal Digital Assistant)
- Smart Phones
- Cell Phones
- iPods and MP3 players
- Tablets

The design of mobile devices and services is important to accessibility. As reading becomesmore inclusive of diverse communities, libraries will need to address the ongoing accessibilitychallenges of the mobile world.

7. Components
- the users,
- the devices,
- the operating systems,
- the services,
- the content,
- the research tracking (how users currently engage with information on the World Wide Webvia their mobile devices.)

8. Pre requisites for implementing mobile based library services
Mobile technology is unlikely to be able to supply the necessary service on its own, but needs tobe integrated with digital technology. The following prerequisites were identified:
- Digitized information base
- Information products designed for an e-platform
- Electronic information service delivery
- Design of electronic access systems.

9. Mobile based site development tools
While libraries can make their own mobile sites, there are also different services that translate thewebsite into a mobile friendly interface. via the use of CSS (Cascading Style Sheets) or ADR(Auto-Detect and Reformat Software) which allows a website to rearrange its control andnavigation to suit the size of the screen it is being viewed on. That way websites will look goodon all sizes of screens including the popular netbooks and libraries will be well positioned tomeet future demand.The library websites (with or without OPACS) which are especially designed for viewing onmobile devices are as-American University Library, Boston University Medical Centre Mobile Library, CambridgeUniversity Library, Cornell University Library, Duke University, Florida InternationalUniversity Libraries, London School of Economics (LSE) Library

10. AdvantagesofImplementationof Mobile Technologyin Libraries
10.1 User-friendly Aid
Familiarity with their own devices and technology helps the users in accessing informationquickly and does not require orientation and training. Mobile users are using the facilities onmobile phones like SMS, instant messaging, web browsing, e-mail effortlessly tocommunicate.Most of these features are pre-installed on mobile devices or option for data plan packages.

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10.2 Personalised Service

Personalised service helps users to interact with library staff to seek specific information orreference away from library.

10.3 Ability to Access Information

Information access from anywhere at anytime will be of great help for users who cannot visitlibrary in person and provides a constant link to required information resources.

10.4 Time Saving

Users need not record information about resources while browsing and searching libraryresources or wait at library transaction counter to renew/reserve books and hence the time of theuser is saved.

10.5 Remote Access to E-resources

The main aim of any academic library is to enhance and strengthen the teaching, learning and research process by installing seamless document/information delivery system and around the country all libraries of higher education system have been working hard to provide services and access to collections to the users who have been displaced due to COVID-19. While all the libraries under study have provision of remote access to subscribed e resources, many have taken a lot of effort in leveraging and expanding existing online services. Notably IITKGP, IITK, IITBBS, IITGN, IITJ, IITI, IITM and IITBHU have displayed step by step user guide on remote login to get access to the licensed E-resources.

10.6 User Participation

Libraries can enrich OPAC by allowing users to incorporate user created content like notes orimages uploaded by users.

10.7 Location Awareness

Mobile communication enables libraries to offer location-based services/content through globalpositioning system (GPS) capabilities. Libraries can guide the users to the location of specificdocument or service through maps and navigational tools.

10.8 Limitless Access

All online resources accessible on their desktop also become accessible through mobiles.

10.9 Access to Print-disabled Users

Mobiles communications help providing services orally to vision-disabled and physically handicapped users.

11. Draw backs of Mobile Technology
- compared to wired Internet service, has relatively slow transmission speed
- limited computational power
- inconvenient input and output interface
- insufficient contents
- high price
- Virus

12. Barriers

Although mobile Technology holds great promise for library services, there are somelimitationsor barriers in providing library services such as
- Contentownership and licensing,
- Usually expensive and resource intensive

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- Limited memory of mobile devices
- Digital rights management,
- Access to information in the digital age.
- Reach of an external vendor into the digital collections and technologies – sustained accesswill be an extremely important issue for libraries if they adopt mobile Library technology andservices that offer content from providers outside of the library.
- Another pressing concern about mobile technology in the library is privacy - because of the risk that patron usage information can be used and exploited by law enforcement official andthose who commit identity theft. Mobile technology is changing the relationship betweenlibraries and their users--by expanding services and posing new challenges to reader'sprivacy.
- Issues related to trust and security - Libraries should be wary of entrusting user informationto locations in the cloud that may offer a different level of protection from that provided byin-house library infrastructure
- Some of digital content can only be accessed on certain devices, and this can have a "chillingeffect" on learning and library service because it locks some people out.
- Lack of appropriate mobile-friendly academic content to meet learners' needs.
- difficulty in supplying content to an increasingly mobile student body
- problems in finding and accessing the content needed for mobile learners from the libraryperspective
- The use of wireless devices is increasing rapidly, yet there is concern in the scientificcommunity that this technology could have adverse side effects.
- Lack of staff awareness and familiarity- Setting up text alerts, for instance, requires technicalexpertise from staff who understand how the library management system producesnotifications, as well as staff or consultants who can help to set up an interface with a simcard modem or a suitable service in order to deliver those notifications as text alerts
- The dearth of technological expertise among staff members and
- Increasing staff reductions and other cutbacks

     Mobile phones are still viewed by the majority of people as devices for making phone calls andtext messages, so they often don't associate them with other activities, such asinformationseeking.However, people are increasingly dependent on their mobile phones and there is agrowing minority who do use them as diaries, for taking notes and for e-mail and internet access.As a result, there may be an increase in expectation from Library users that libraries will providesome services in a mobile friendly way.

13. Solutions
Libraries should conduct analyses and make smart decisions, such as –
- Support staff education,
- Explore partnerships
- New funding models,
- Ready to compromise when it comes to their traditional information delivery models.
- Protect themselves from deceptive content agreements with third party providers.
- Need the expert knowledge of mobile devices to flow through the profession and not just liein the hands of recent library school graduates
- Tell users about the thousands of free mobile-ready books available from such initiatives asProject Gutenberg
- Create opportunities to educate staff, build local expertise, and promote discussion byoffering training sessions and professional development options
- Build a solid foundation of knowledge about mobile services within the organization.
- Host lectures or discussion groups or include such information in their websites, blogs, ornewsletters.

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As the use of mobile technology grows, library staff will need to learn and use the technology toserve library users where they are, and libraries will face management, funding, and trainingchallenges in meeting this need. Instead, expert technical knowledge must flow throughout theprofession.

14. CONCLUSION

The outbreak of the COVID-19 pandemic has necessitated sudden and radical changes in delivery of library services, as strict social distancing and lockdown measures were imposed in the early phases of the pandemic. The Internet and web technologies have created a new and unparallel environment and enabling the libraries to enhance and strengthen the research, teaching and learning even in this difficult and uncertain time. The concept and practice of providing remote access of e resources by libraries is not new, but the user-friendly way adopted by many libraries and the number of resources made available by them during the pandemic is exemplary. There is a growing influence of mobile technology in Libraries, especially as network accessbecomes more affordable and reliable, and mobile applications have seen mainstreamacceptancein teaching, learning, and research. This trend will likely continue, and one-way libraries canrespond to this emerging trend is to make the library's website easily accessible via web-enabledmobile devices. Libraries should make conscious choices about what they want to offer in thisarena and act accordingly and only time will tell if a completely mobile-accessible library, interms of its services and collections, will become common place.

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