Role of Mobile Technology in Library application and Practices

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Abstract

Advancement of technology demands more and more use of mobile phones for a range of activities in Library services. The use of smart phone changes education scenario in 2020-21, though it supports a lot of pedagogical tasks for students but it also responsible for destruction during classes. In this paper authors aim to discuss the utilization of smartphone in higher education in Uttar Pradesh, India. Presently librarian manages data information that is being accessed by the students through their mobile/electronic gadgets. The study reported that about 88% students in higher education utilize this technology for their teaching learning now a days. The highest collection of volumes in Banaras Hindu University library covers only 12.2% of the volumes of Massachusetts University of USA. Internet service provider Reliance Jio alone extends more than 50% share. Universities like Lucknow, BHU and Allahabad University provide 75, 80 and 555 personal computers respectively for their library services.

Keywords: Mobile technology, library science, digital India and communication.

Introduction

Presently the blast of literature is accessible in every field that leads to the increase of their customers and their needs as well as the present advancement of electronic media are compelling the libraries to create and take part in electronic systems. A single library alone cannot handle all the materials published in the world for their users. Therefore, the resource sharing among the libraries through the consortia over networks have chosen as one of the best ideas that lead to reduce the cost of information. A clustered of libraries are broadly labeled as a group of libraries coming together with some agreement of understanding to help each other with a view to satisfying the information needs of their clientele[1]. At present library network offers a national/international platform that beautifully designed to bridge the gap among a range of libraries and also set up links among the organizations, professional users involved in R&D and manufacturing activities in the country. As per the view of library scholar library networks now can fulfill near about 70 requirements in library information system, it also creates and improves the infrastructure including computer network support and provides informatics-based support and services to the specialized community working in various subject areas[2].

Today young generation in the world is spending their time with hand set or with any type of electronic gadget. Hence mobile technology is performing very vital role in user's data seeking behavior in different fields. It was noticed that in the field of teaching learning and analysis work, it also plays an essential role amongst the students of twenty first century. In this advancement of modern technology currently 371 milion of individuals are using mobile for varied functions. Considering the kid to grown up man and rural to urban individuals use mobile technology. Library resource isn't away from this new concept, from the beginning of initiation of project designed to deliver mobile is utilized from the year 1993 when the mainframe computers were installed in few places. Currently a mechanical man also uses and collect their data, stored, organized, accessed, retrieved and consumed through the system. A growing range of users are participating and exercise as search tools. Multi varied cell phones, iPhone, and tablets are currently utilized among the primary places for seeking data. Mobile played a key role in enabling digital India and it act as a sensible issue in the mind of the people. Connected mobile devices will currently connect individuals and things virtually anyplace and anytime. This makes the client $24\times7\times365$ hrs development, approachable anywhere at any time. With access of cloud storing applications virtually each mobile device with net connection can provide huge data storing with efficient power of computing. Life pattern of individual have drastically revolutionized by the use of mobile now a days. The hand set/mobile phones (also known as telephone or cell phone) don't use wires or cables, however it works with radio waves and may be carried any places[3]. Mobile phones are presently being employed with success in India and in alternative developing countries to share data within the areas of analysis, teaching, learning, health, agriculture etc.

Here the author has put his effort to find out the use of cell phone that can assess the resources of different important libraries in the zone of Allahabad and Banaras in Uttar Pradesh. Most of the libraries under the study is now combined with the radio frequency identification (RFID) and provide their safety system with the help of two-pedestal antenna. It acts as the

integral nerve center of the institution by possessing the knowledge of students and faculty members' update. Information data bank is constantly updated and facilities are added. These libraries are trying to provide best possible service to the academic community within its limited space available. The functionaries of central library are guided by the setup of Library and Learning Resources Center (LLRC) and working group. All these reputed libraries have set up their own database and Wi-Fi network to facilitate their students, faculties and research personal through their open access resources. The author also made a comparative study amongst these libraries in the arena of higher education.

Figure-1: Shows the use of mobile phone in few different fields of student works.

Brief History of Mobile Phones/GSM in India

The department of Posts and Telegraphs (P&T) engaged a small corner of the Public Works Department, at that time. Initially it was 4,000 miles (6,400km) of telegraph lines that started in November 1853. The services were introduced in India by the British in 1886 to facilitate colonial administration in the country. In 1966 after few years of independence, there were only 18,724 telephone lines were used by population of about 40 million people[4]. Postal and Tele communications department split into postal division and telecommunication division separately in January 1985 and later it was merged with the Nigerian External Telecommunication Limited (NITEL). The main objective of separating and remerging was to harmonize the planning and coordination of the internal and external telecommunications services in the country[4]. Initially in September1997 by the ministry of communication and the Indian telecommunications limited (ITEL) approved cellular network that was managed by NITEL cover Lagos, Enugu, and Abuja with a capacity of 10,000 lines with one Mobile Switching Centre (MSC) in each area, while MTS Ltd. operates 5,000 cellular line capacity network based in Victoria Island, Lagos[5]. There after continuous improvement has been carried out in the field of communication and networking in India and aboard till today.
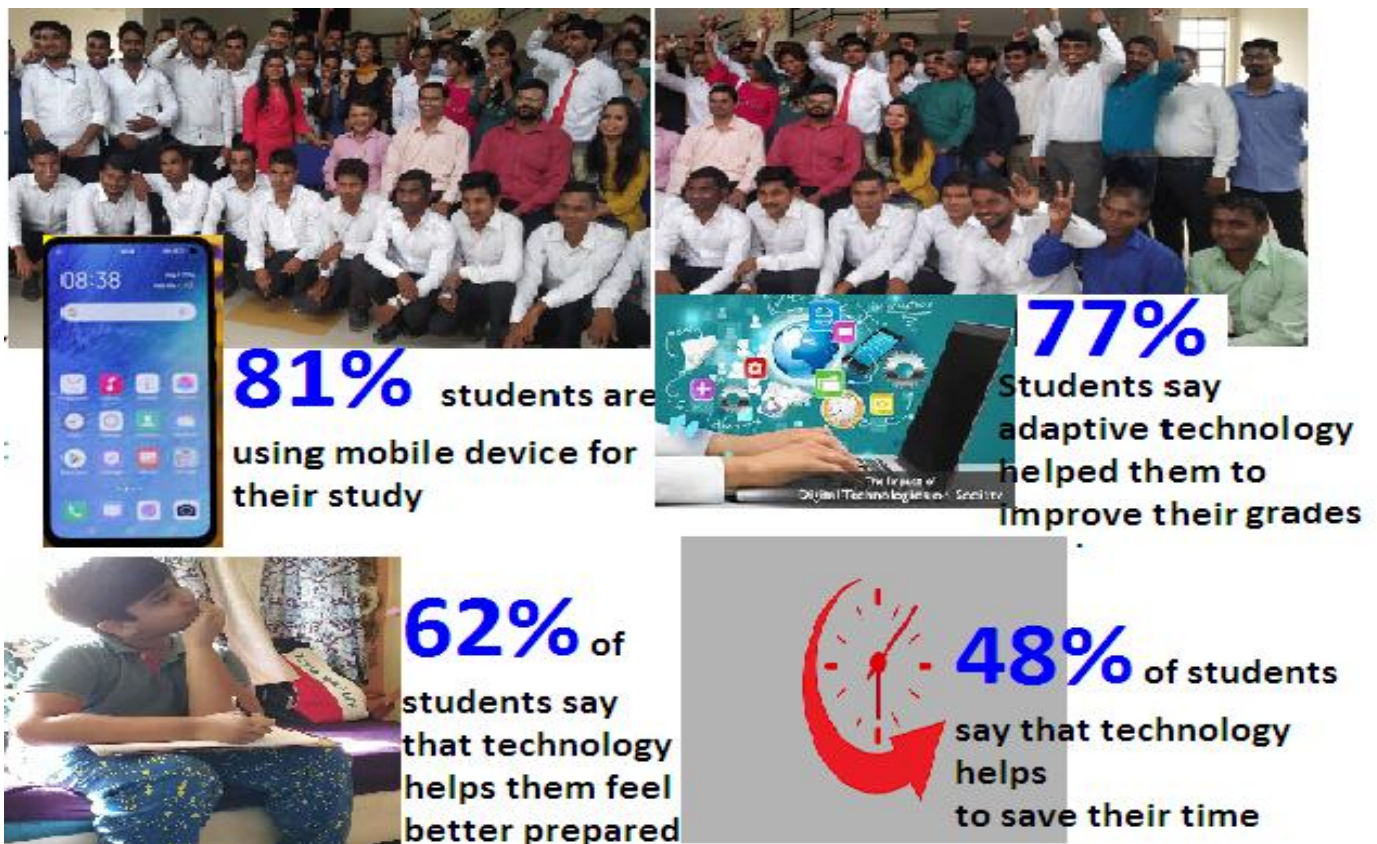

Figure-2: Shows Mc-Graw Hill Education's survey in the year 2015 digital trends in Higher Education as shown.

In Figure-2 mentioned that the survey made by Mc-Graw Hill Education's in the year 2015 clearly describes the benefit of mobile technology in the field of education and research helps the students in varying ways. Presently 81% of the students are using mobile phone for their higher education in which 77% of the strength clearly declaring mobiles facilitates to improve their academic grades. About 62% of students feel mobile technology severely assist to prepare their academic materials and 48% students in the world think this technology aid to save their time for preparation. The authors also make a survey after post COVID-2021 lockdown in his own college at LDC Institute of Technology, Soraon Allahabad and the report is presented in the Table-1. The study reported that the students in the higher education are mostly uses their mobile phone for the purpose of their teaching learning processes and near about 88% students in higher education utilize this technology for the presentation of seminar, project thesis as well as recruitment processes now a days.

The Global System for Mobile (GSM) communications is developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation (2G) digital cellular networks that is used by mobile devices such as mobile phones and tablets. GSM supports more advanced technologies in data capturing and distribution. These technologies allow for a greater bandwidth and permit the development of mobile applications. As the most matured digital-cellular standard, GSM networks offer cellular switched data services well in advance than other networks. GSM is known as the second generations (2G) after the old analogue system, which was first generation (1G). The advent of GSM was revolutionary, especially because of its roaming capabilities[6] and presently third generation (3G), fourth generation (4G) and fifth generation (5G) have originated into the field of mobile application.

Role of mobile in digital India

Mobile technology is an advance communication tools and this field progresses very fast day by day to communicate, receive and shear ideas in numerous ways. These portable tools accomplish convenient access to the globe information system across borders of subject, discipline and organization. As recognition of its role and policy the world have targeted libraries as a community resources that may offer access to and sustain for the informational resources conferred by the webs. Thompson _et al._[7] indicate that all data were stored on the server information. Administrator or librarian can manage data information that will be accessed in the library service, lecturers and students can be benefited from this information through their mobile applications. The companies like Reliance Jio, Bharati Airtal, MTNL, Vodaphone and few small service providers those who are toiling to provide broad band and informative services in India in this sector. There are abrupt changes takes place in this field in tern of area coverage, distribution and better speed / receiving data etc. Cloud storage in data option also creates new generation in this field. In Figure-3 demonstrate the various service providing sectors contribute in the arena of broadband with digitalized India. The pie chart demonstrated that Reliance Jio extend their services more than 50% of broadband services whereas Bharati Airtail and Vodaphone cover 20% each in this field. The major improvement in Indian communication industries is observed in last decade and the improvement of communication takes place in rural areas is more than urban areas in last four years.

Indian communication system extends their path equally in the rural areas along with modernized urban area. The growth expected to the year 2027 is estimated as shown in the bar chart.

Artificial Intelligence (AI) and Machine Learning (ML) in the field of communication: The new generation of Artificial Intelligence and Machine Learning (AI&ML) opened a new concept of development in Telecom industry and their user in 2019.

Improved Connectivity: The people nowadays use internet and also speak with our friends and relative while travelling in flight. This is very busting for the airline service provider. IT changes the will and desire of user. The improve connectivity, better data surfing and storage changes the field work and saving the user time. The beneficiary impact of this technology is viewed each and every sector, but its major influence is observed in higher education considering every step of journey of the students in India and abroad.

Table-1: Describes those students are using their mobiles in their learning process in different level of education.

Sl.No.	ITI students (224) of LDCITS	Diploma students (240) of LDCITS	B.Tech students (665) of LDCITS	MBA/MCA Students (179) of LDCITS
Having mobile of its own	56%	94%	99%	100%
Mobile is used for learning	18%	84%	91%	91%
Mobile used for on line classes through Zoom	11%	82%	91%	90%
Mobile used for on line interview and presentation	1%	21%	76%	82%

Results and analysis based on collected data

To find out the effect of mobile technology in the field of higher education we have collected information from five different institutes in our close view. These are IIIT Allahabad; Motilal Neheru National institute of Technology, Allahabad; Lucknow University; Banaras Hindu University; University of Allahabad and they were numbered as shown in Table-2 for comparing the varying collection, volumes, E-books, E-journal and Thesis's etc.

Though information and communication technology (ICT) in library application has taken major role at present despite it has a few barriers in tern of security and services. The technology satisfies present needs and requirements of readers and this invention helps to prosper with the use of data technologies[8]. Libraries are units where ICT essentially requires at every step of transmission of data, through phone/computer and broadband lines, cellular networks, cable TV and also through internet nowadays. Based on the collection of data from the different libraries, it was observed that the highest number of volumes is kept in Banaras Hindu University out of these five libraries in Uttar Pradesh as shown in Figure-4. Despite the highest collection of volumes in Banaras Hindu University covers only 12.2% of the volumes preserved in Massachusetts University of USA.
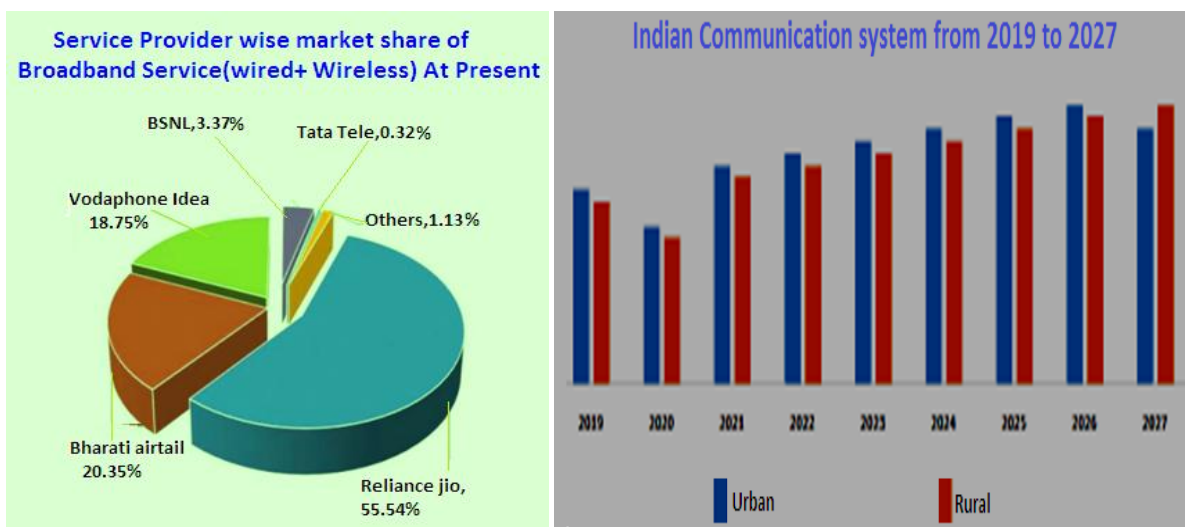

Figure-3: Shows that the broad band service is shared by the service providers in India and its expansions is gradually improve in the urban as well as rural areas is expected till to the year of 2027.

Figure-4: Artificial intelligence and machine learning as well as improve connectivity at the station improve the ability of smart phone anywhere any time.

Table-2: List of major libraries and their serial numbers for the purpose of analysis as given below.

IIT Allahabad	MNNIT, Allahabad	Lucknow University	Banaras Hindu university	Allahabad University
01	02	03	04	05

On the other hand, if we look forward the services of the library through the application of Computers in the library, we observed the top most universities like Lucknow University, Banaras Hindu University and Allahabad University have kept 75, 80 and 555 personal computers for their library services respectively. The collection of reading material in different libraries in Uttar Pradesh are mentioned in Table-3.

All urban and rural libraries are facing challenges to satisfy their customer's desires since their users such as researchers/innovators, professors, under graduate and postgraduate students are hard to please their students. The broad band internet, different apps and World-Wide Website (www) have created facility to attain university lectures, research works to the students across the world by the application of mobile/electronic gadget at the library or elsewhere. Librarians should perform substantial contributions as information disseminators, they ought to understand and exploit ICT infrastructure and rising technologies in delivering services to their patronage[9].

According to Terplan[10] "telephones and e-mail are necessary tools to facilitate prompt handling and response to the stream of patron queries within the library user community. Mobile phones can be deployed at the enquiring desks. Massages, WhatsApp and Facebook on the market on all electronic gadgets (mobiles and Tabs), can be used to produce consciousness amongst the users of libraries to inform coming events and new entries. This might be flashed through a facility referred to as "broadcast" wherever one text message is distributed to any or all the library contacts listed within the address book on the mobile directly. Academic libraries have to be compelled to follow of the dynamical desires of their clients. A method of delivering user-centered services is required to promote library services. Survey can be carried out to quantify the process with text and transmission electronic message. Patrons may text a coded range to a selected nonunion to point their preference but a specialized and customized information services is to be achieved to provide better information to one or all associated in the system.
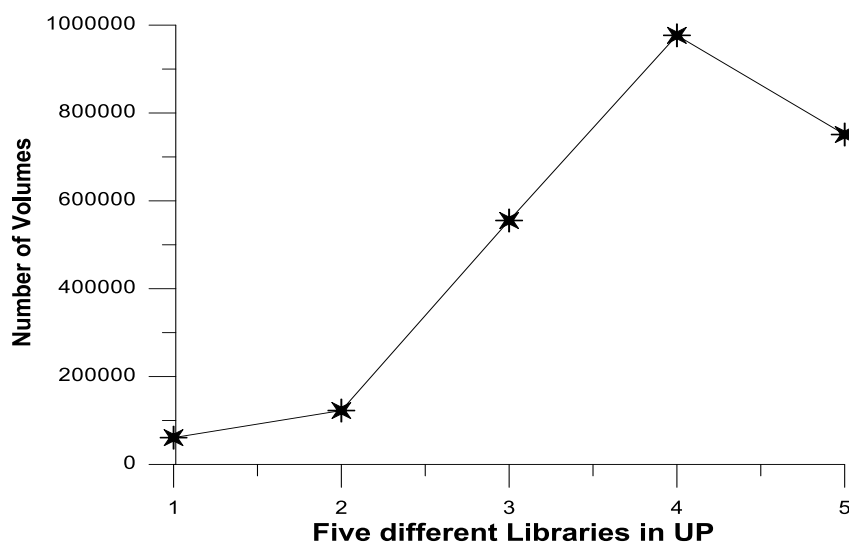

Figure-4: Describes the total numbers of volume are kept in five different libraries in varying zone of Uttar Pradesh in India.

Table-3: Shows different reading material listed in six different institutes in Uttar Pradesh and Massachusetts University is taken just for comparison with top institute of UP.

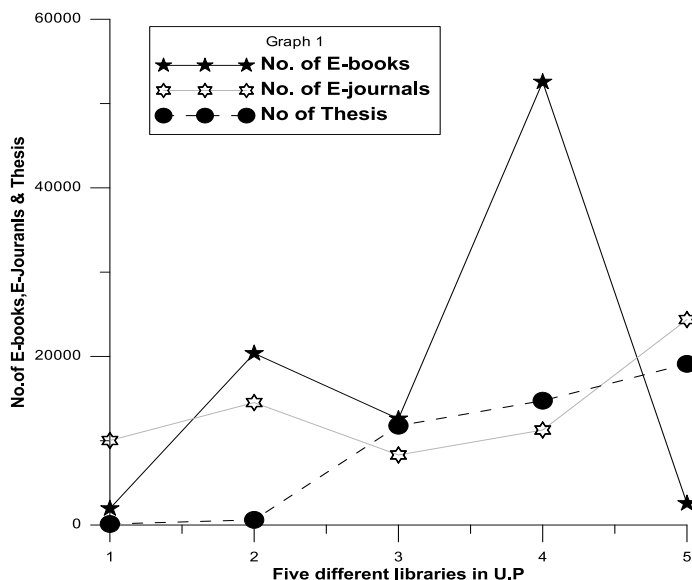| Institute	Volume	E-Book	E-Journal	Thesis	PC	Rare collection
IIIT, Allahabad	61000	1956	10028	122	20	270
MNNIT, Allahabad	122670	20363	14526	609	40	412
Lucknow University	555264	12600	8310	11781	75	454
Banaras Hindu University	976411	52560	11272	14748	80	512
Allahabad University	750983	2564	24375	19118	155	484
Massachusetts University	8,000,000	700,000	55,000	180000	4200	1100

Figure-5: Describes the separate plot of e-book, e-journals and total number of thesis kept in five different Libraries in varying zone of Uttar Pradesh in India.

From the plot of Figure-5 it is describing that though the university of Allahabad collected only two thousand five hundred sixty-four (2564) numbers of e-books whereas the e-journals and Ph. D thesis in this library turned around to be maximum compared to all other institutes in Uttar Pradesh. The other institutes such as Lucknow University, Banaras Hindu University are lagging in terms of e-journal and in number of thesis's. Number of collection of e-books stored in Banaras Hindu University is the highest compared to all other universities as fifty-two thousand five hundred sixty (52,560).

Mobile Technologies and Library Services

Mobile technology provides the key role in teaching learning processes in present condition. It is also solving all major issues in the period of lockdown and post COVID situation. The different collection of e-materials and the related teaching methods now a days totally depends on mobile or any electronic gadget. To match with the situation, the libraries are supporting self-directed and independent learning; Libraries also play an increasingly important role to search and to provide access to resources of learning materials for the benefit of students and teachers as a whole. Here in Figure-6 illustrate that all libraries were kept varying numbers of personal computer in the library to facilitated students' services, amongst these all-libraries Allahabad University holding hundred and fifty-five (155) personal computers for library services. earlier it is very difficult to get all rare collections in different libraries, as the internet services become common, all these rear collections become easy assessable to the readers but still theses heritage books and literatures are in demanded every times. Here in the plot of Figure-6 demonstrates the numbers of rear collections in different libraries in Uttar Pradesh, India.
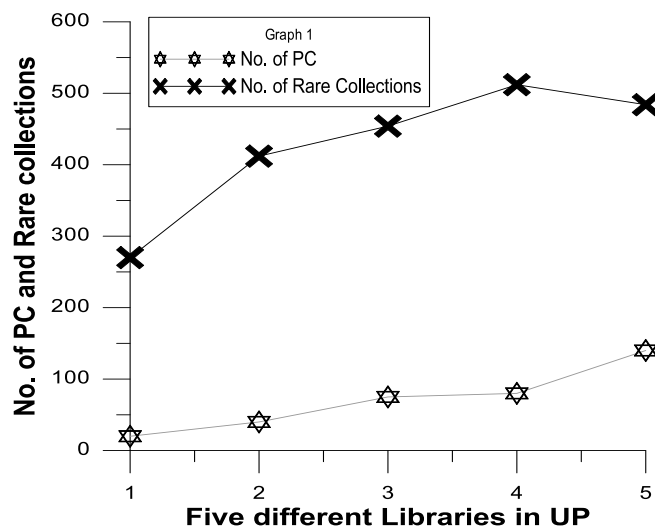

Figure-6: Illustrate the numbers of personal computer used for enquiries, issues and returning books and other materials and numbers of rear collections in five different Libraries in varying zone of Uttar Pradesh in India.

To get an over view and the applicability of mobile/ electronic gadget for the purpose of library information, the author has collected the data for a period of one year from August 2019 to July 2020 and plotting the data in the form of histogram. The bar chart clearly viewed that in the month of October, number of e-books searched about two thousand two hundred sixty (2260) whereas the lowest number of e-books eleven hundred twenty (1120) searched in the month of December 2020. There are no defined trends are observed in a year but e-book searched in summer is comparatively more than winter session of an academic year.

Similarly, in Figure-7 designates the readings of e-journal in Allahabad University through mobile/ electronic gadget in 2019-20, the author plotted all the data for a period of one year from August 2019 to July 2020 and expresses his opinion that the e-journal viewed in the month of September is the lowest comparing to other months, it may be the cause of semester break or the end of academic years for the students. The data clearly expresses that journal viewed in the month of September and December in 2019 and January 2020 are comparatively lower than the other months in the year.

The bar chart of Figure-8 depicts that the month of February to July 2020 the readers of e-journal remain almost constant in the library of Allahabad University. There are no defined trends are detected from august to January but there after slight declination is observed in numbers of viewer in e-journal.

Services that are commonly used by mobile in library: i. Presently mobile is used for On-line Public Access Catalogue (MOPAC), ii. It is being used for enquiring books, journal /different research papers, iii. It is mostly used for E-mail and SMS information, iv. E-Resources can be easily traced through

Mobile, v. It provides library maps and floor plans whenever required, vi. It helps to get information like library news, events, blogs and list of new Arrivals, vii. With the help of mobile, individual can reach to library data bases, viii. It helps to provide inter library loan service, ix. It helps to look photo/video gallery of concerned library, x. It is easy to get feedback / comments /suggestions through it, xi. We can contact library staff for help as when required.
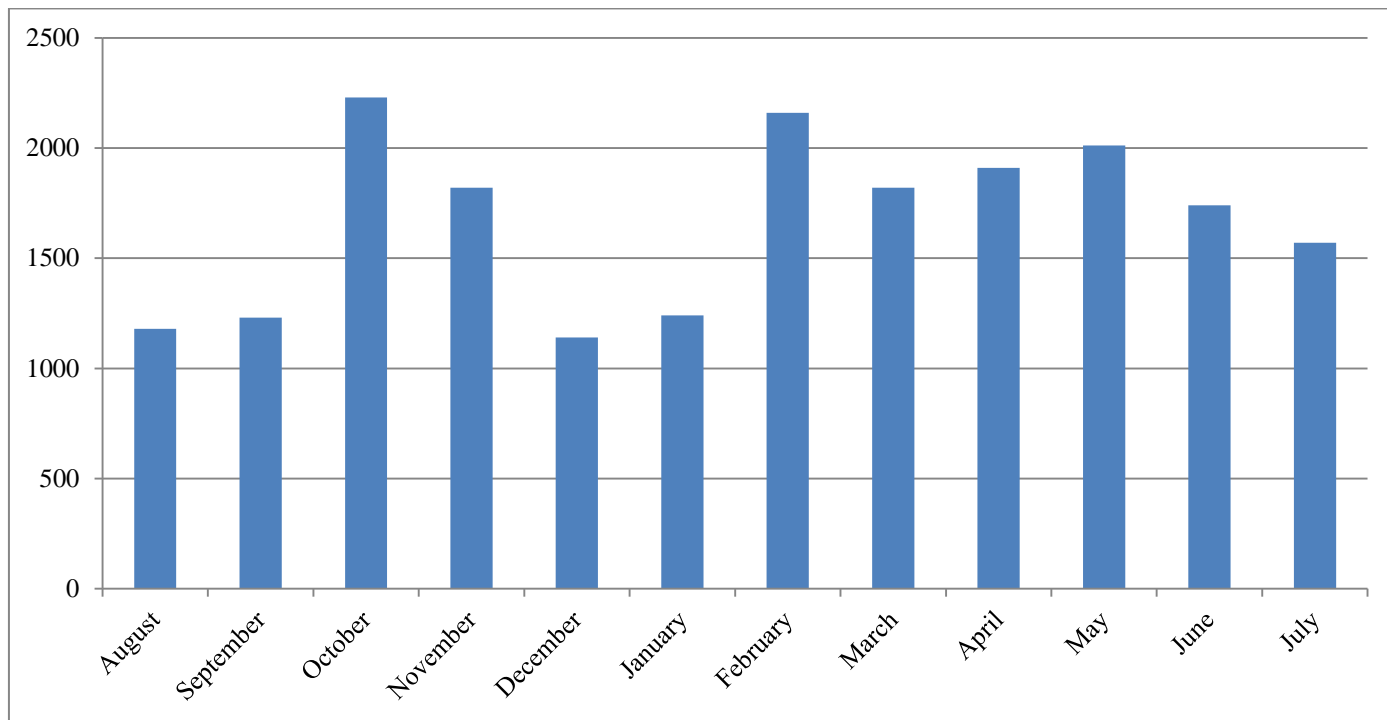

Figure-7: Demonstrates the numbers e-books searched in Banaras Hindu University of Uttar Pradesh in India.
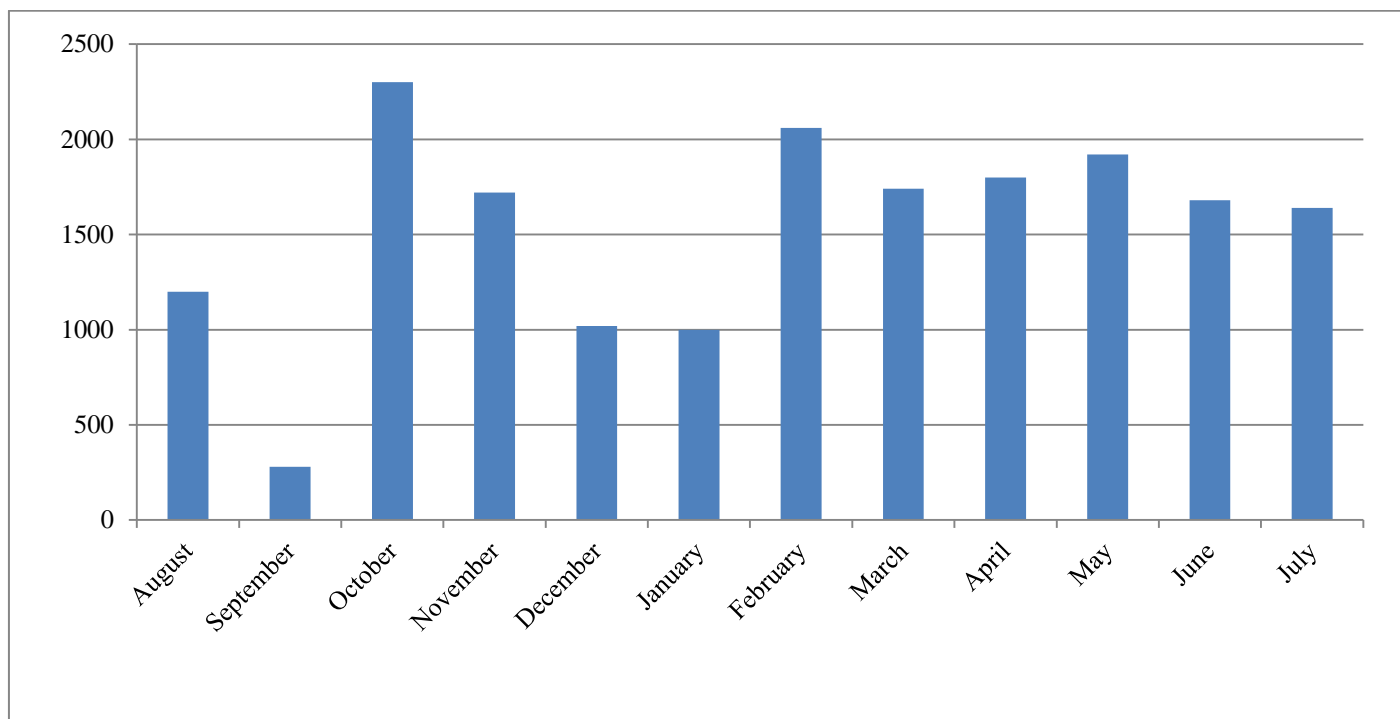

Figure-8: Demonstrates the numbers e-journals searched in Allahabad University.

The few advantages of using mobile services in library application: i. Gradual advancement in the technology facilitate that it is user friendly, ii. It is very specific and provides personalized service, iii. It accomplishes to access information in hand, iv. Effectively it saves time, v. It provides unlimited access and information concern to library.

The few limitations of using mobile services in library application: Though the latest advancement gradually opening the different possibilities of enjoying the services in any field despite there are certain drawbacks associated it. The common difficulties that are highly noticeable are noted below: i. Defined ownership as well as licensing is very essential to prevent misuse the technology. ii. It is very expensive for common people and resource intensive, iii. Though it can access huge data but have very limited memory, iv. It is necessary for digital rights management for proper functioning.

(a) Attainment to the external vendor for the digital collections and sustaining its access will be an extremely important issue for libraries if they adopt mobile Library technology and services that offer content from providers outside of the library. (b) The major key concerned about mobile technology in the library is privacy - for this reason the risk that patron usage information can be misused and exploited if the precaution is not taken. (c) There are issues associated with trust and security - libraries should be cautious of entrusting user information to locations in the cloud that may offer a different level of protection. (d) Sometimes there are problems in finding and accessing the different contents needed for mobile learner from the library's perspective. (e) Awareness of staff and familiarity is still lacking. (f) The lack of technological experts and increasing staff reduction is a major issue of unemployment. (g) As mobile phone is an essential item for individual perspective as a result there may be an increasing expectation from library users that libraries should provide all major services in a mobile friendly procedure.

Based on feedback of users of mobile for library application the different suggestion is made these are as given below: Time to time libraries should conduct analyses of their own to provide a clear decision, such as i. Training and education of their support staff, ii. Partnerships model to be established for better services, iii. Look for new funding models to offer service to the user, iv. They should compromise when something will come to their traditional information delivery models. v. The arrangement should be made to protect themselves from deceptive content agreements with third party providers. vi. The expert knowledge of mobile devices to be employed to conduct smooth flow work for library, vii. Information to be circulated for the users about the thousands of free mobile-ready books available for the benefit of readers, viii. Create a concrete base of knowledge about mobile services within the organization and its locality. ix. Defined websites, blogs, or newsletters are to be maintained to circulate the library in formation amongst the readers.

Conclusion

Mobile is a unique inevitable tool for information communication that is very essential for today's life. The application of this technology is being used for library services by the users to fulfill their requirements. The distribution of information to all users is a major issue in a cultured society. Libraries particularly use many tools and techniques to flow into the data to the user community. The modern libraries ought to be publicized the latest trends and techniques. An effective library system might influence the remote users by implementing of mobile technology in its services. Based on the work of author the following conclusions are made on the study of role of mobile technology in library application these are mentioned as: i. The utilization of Smartphone in higher education and library services in the zone of Allahabad and Banaras in UP. ii. Presently librarian manages data information that is being accessed by the students through their mobile/electronic gadgets. iii. About 88% students in higher education utilize this technology for their teaching learning, presentation of seminar, project thesis as well as recruitment processes now a day. iv. The highest collection of volumes in Banaras Hindu University which is only 12.2% of the volumes preserved in Massachusetts University of USA. v. Reliance Jio alone provides more than 50% of broadband services, Bharati Airtail and Vodaphone engage 20% share each to deliver internet services through mobiles. vi. Top most universities like Lucknow University, Banaras Hindu University and Allahabad University have provided 75, 80 and 155 personal computers for their library users. vii. The highest and the lowest number of e-books searched in a library were thousand two hundred sixty (2260) and eleven hundred twenty (1120) respectively in a year 2020. viii. For a period from February to July 2020 the readers of e-journal remain almost constant in the library of Allahabad University. ix. There are no defined trends were observed from August to January but thereafter slight declination was observed in numbers of viewer in e-journal.

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